

OCCUPATIONAL HEALTH AND SAFETY ISSUES INVOLVING CASUAL WORKERS ON BUILDING CONSTRUCTION SITES IN GHANA, A KUMASI STUDY

By

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DECLARATION

This work or any part thereof has not previously been submitted in any form to the University or to any other body whether for the purpose of assessment, publication or for any other purpose. Put aside any expression, acknowledgements, reference and/or bibliographies cited in the work, I confirm that the intellectual content of this work is the result of my own efforts and no other person.

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ABSTRACT

The term “casual workers” refers to individuals who are engaged on temporary basis to work for a period of time not exceeding six (6) months, and whose remunerations are calculated and paid on daily basis. Typically of many construction economies, this type of employment has increased over the years with its accompanying occupational health and safety issues. Interestingly, very little research on occupational health and safety of casual workers in the Ghanaian construction industry has been done. The objective of this study is to establish the health and safety practices with a view of proposing a framework for evaluating health and safety on construction sites. Using purposive sampling technique, 100 questionnaires were distributed to contractors, project engineers, project managers, foremen and casual workers. Seventy-five were retrieved. Twenty out of the seventy-five were found to be too badly completed to be useful for the analysis and were therefore discarded. This brought the responses effectively to fifty-five, representing a response rate of 55%. The data was analysed using descriptive statistics, scale ranking, chi-squared (χ^2) test and one sample statistics of importance.

The findings indicate that 60% of building contractors in the Kumasi Metropolis do not provide welfare facilities and safety materials to casual workers. The findings also indicate that first-aid equipments, safe drinking water, sanitary facilities, provision of personal protection equipment (PPE) and training of casual workers on safety procedures, were the measures needed for addressing the occupational health and safety issues confronting casual workers on construction sites. It is recommended that Safety Officers from Ghana Labour office should liaise with the Ministry of Water Resources, Works and Housing and in conjunction with the Association of Civil Engineering and Building Contractors, regularly visit construction sites to ensure the enforcement of laws governing the provision of welfare facilities and safety materials, employment, and rights of casual workers. It is also recommended that contractors should be encouraged to set up Human Resource and Safety Departments for the purpose of executing

safety education campaigns and training programmes to all casual workers. It is further suggested that five to ten minutes each morning be apportioned to briefing on health and safety to all workers, including casual workers, before commencement of work, to inculcate in them safety awareness, and improving safety on construction sites.

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DEDICATION

This Dissertation is dedicated to **BRIDGETTA OWUSU DANSO, NANA KWEKU OWUSU DANSO** and **NANA KOBINA DARKO OWUSU DANSO** and **MAAME ESI OWUSU DANSO**

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CHAPTER ONE

GENERAL INTRODUCTION

1.0 INTRODUCTION TO THE STUDY

The construction industry plays an important role in any economy and its activities are also vital to the achievement of the socio-economic development goals of providing shelter, infrastructure and employment (Anaman and Osei Amponsah, 2007). Indeed, the interdependence of the construction sector and economic development has been addressed by various writers and in all cases, there is evidence indicating a direct link between investment in construction and economic growth. For instance, in an extensive study by Lopes (1998), it was revealed that countries that invested minimum of 4% into construction industry are likely to grow faster in their Gross Domestic Product (GDP).

In Ghana, just like many other developing countries the construction industry is playing a vital role to achieve socio-economic development goals, providing shelter, infrastructure and employment, and above all contributing significantly to the GDP of the country. For instance, since 2003 to 2008, the industry has consistently provided an average GDP growth of 6.1% to the economy. Indeed, the construction industry in Ghana was the third largest growing economic sector outstripping the manufacturing industry in 2004 with a constant GDP growth of about 5.8 % from 2004 to 2005. This remarkably consistent growth increased to 6.1 % in 2006. In 2007, it had picked up again from 6.2% and peaked at 7.3% in 2008 (ISSER, 2005, IYF, 2009, IMF, 2009, DI, 2009). This shows that the industry has a huge potential of leading the way for the economic development of developing countries such as Ghana if well exploited. Thus in specific terms, the Ghanaian construction industry could be the instrument for achieving the infrastructural guidelines of the Millennium Development Goals (MDGs) and The Ghana Poverty Reduction Strategy II (GPRS II) agenda. One of the main agenda of MDGs and GPRS II

is to address human development issues of which Cotton et al (2005) noted that the agenda is achievable by the provision of infrastructure for services and employment through the construction industry if health and safety on construction sites are improved to promote and sustain efficiency.

However, despite this strategic importance of the Ghanaian construction industry, the industry is fraught with occupational health and safety issues. For example, it was reported that the construction industry, recorded 902 accident cases comprising 56 fatal accidents in 2000 and 846 non-fatal accidents (Danso, 2005). In that same report, Danso (2005) indicated that Kumasi (the regional capital of Ashanti Region) alone recorded 124 construction accident deaths from 1999 to 2004. Literature available on this subject indicates that the construction industry all over the world is among the leading cases of accidents. For example, the ILO's global estimates for 2003 indicate that each year at least 60,000 fatal accidents occur on construction sites around the world or one fatal accident in every ten minutes. Like many construction economies, casual workers within the construction industry appear to be increasing because, construction firms rely enormously on the use of casual workers and Ghana is no exception. However, the ILO (2001) has indicated that, casualisation in the construction industry has led to debilitating effect upon occupational health and safety issues especially in the developing countries. This led some writers to research in that area and that indeed in almost all cases, there were pieces of evidence indicating that the health and safety of casual workers had been compromised. For example, a base study conducted in Tanzania by Mitullah et al (2003) revealed that about 70% of casual workers were not provided with welfare related facilities and safety materials at most of the project sites resulting in accidents and sometimes fatal on construction sites.

Writing in the same vein other writers such as Wachira (2003) and Buchanan (2004) also dealt with the situation of casual workers on construction sites to assert why contractors want to still engage casual workers on site and provide substandard safety materials and poor welfare

facilities, and why casual workers want to continue to work in such unsafe conditions. Factors such as the ready availability of casual workers, casual workers being cheaper to employ, and as a means of saving on labour among others, are all plausible in the case of employers. Socio-economic conditions of the casual workers themselves have been suggested by some writers as one of the reasons why casual workers want to continue work in such unsafe conditions. For example during the ethnographical study by Buchanan (2004), the author found casual workers were unwilling to leave dangerous work situations because they recognised the turnover of workers and hence, worried that they would be replaced if they complained about safety hazards on construction site. Other writers are of the view that the lower level of education and the quest of casual workers to meet their basic needs such as food and shelter, among others, have contributed to their inability to refuse to work in unsafe conditions.

Currently, there is no documented data on such issues on casual workers in the Ghanaian construction industry. However given the similarities in the construction industries in some developing countries such as Tanzania, Kenya, South Africa there is little doubt that the trends observed might be different in Ghana.

Admittedly, though some studies have been done in Ghana relating to occupational health safety issues in the construction industry, these studies did not focus directly on health and safety issues affecting casual workers. For example, Kheni (2008) in his studies did mention how workers in their quest to meet their basic needs, such as food and shelter, have compromised their demand of health and safety rights. It is worth noting that the real issues of occupational health and safety issues affecting casual workers were not discussed. Danso (2005) observed in his studies, at improving health and safety on building construction sites that about 65% of construction artisans, especially the new entrants, do not have knowledge on safety issues on construction sites. Again this deficiency of safety awareness is not clearly linked to casual workers. Thus while these studies were making significant contribution towards understanding of

occupational health and safety issues in the Ghanaian construction industry, these studies did not relate the issues of occupational health and safety specifically to casual workers who now constitute about 80-90% of the total workforce on most of the project sites and significantly contributing to the Ghanaian GDP. It is believed that if a study of this kind is undertaken, the occupational health and safety of casual workers on building construction sites will be acknowledged.

1.1 STATEMENT OF THE PROBLEM

As demonstrated earlier, the proliferation of casual workers in the Ghanaian construction industry, has brought with its accompanying occupational health and safety issues giving a bad image to the socio-economic importance of the construction industry. Currently there appears to be virtually no documented empirical evidence of contemporary issues of occupational health and safety on casual workers in the Ghanaian building construction sites. In order to address these shortfalls, the research seeks to find out the occupational health and safety issues confronting casual workers on the building construction sites in Ghana and from which a strategy can be developed to help establish policies aimed at protecting the rights and the safety of these workers.

1.2 THE AIM OF THE STUDY

The aim of this research is to study the occupational health and safety of the Ghanaian casual worker on the building construction sites for the purpose of establishing the critical issues affecting the overall welfare and safety of casual workers on building construction sites, and thereafter make a recommendation towards addressing the shortfalls on construction sites. To accomplish this aim, a number of objectives were set.

1.3 RESEARCH QUESTIONS

The specific questions to the study include:

- What are the challenges facing Ghanaian contractors in respect of the recruitment of casual workers on occupational health and safety issues?
- What are the challenges facing casual workers in the labour market in Ghana?
- What are the contemporary occupational health and safety (OHS) issues confronting casual workers in the construction industry and how this can be incorporated into a framework to meet the challenges of the 21st century?

1.4 OBJECTIVES OF THE STUDY

The specific objectives of the study are:

- i) To review literature on occupational health and safety issues of casual workers so as to get a deeper understanding of their health and safety related issues in the construction industry;
- ii) To develop a theoretical framework for evaluating the health and safety issues that confront a typical casual Ghanaian construction worker;
- iii) To develop a questionnaire out of the framework to elicit data from site engineers, foremen and casual workers;
- iv) To analyse the data on health and safety issues of casual workers using appropriate analytical tools; and
- v) From the findings, make recommendation that policy makers can use to help protect the rights of casual workers.

1.5 WHY KUMASI?

Reference to the topic will reveal focus on Kumasi as a metropolis. Really the intention of this study was to cover a wider scope in Ghana. However, due to especially the financial constraints, the study was restricted to Kumasi. This should not minimise the importance of the findings

because, Kumasi is Ghana's second largest city and capital of the Ashanti region, and it is an important commercial centre (KPMG, 2008). Kumasi's location, climate and safety, combined with Ghana's increasing access to foreign markets, make Kumasi a city among others to attract investment in a number of sub sectors such as agro-processing, the hotel industry, the production of pharmaceuticals, real estates development (KPMG, 2008). Investment in these sub sectors has called for the expansion of some existing facilities such as business centres, retail shops, warehousing, stores and the construction of new ones such as Sokoban Wood village, the affordable housing project at Asokore Mampong, the cocoa processing plant by Archer Daniels Midland,. There is also the construction of new road networks such as the inner ring road at the Oforikrom to Asokwa by-pass and the rehabilitation of urban and feeder roads. Indeed there are a lot of construction works going on in the Kumasi metropolis which have made Kumasi a gateway of attracting pools of workers from the neighbouring villages and towns to be hired for any type of skilled or unskilled construction works, and this should make the study relevant.

1.6 OUTLINE OF METHODOLOGY

The research employed a range of complementary research methods over three phases. In the preliminary phase, background information on casual workers was gathered from literature. This helped in developing a theoretical framework capturing the key issues relevant to the industry. Following this, closed ended questionnaires were developed for collecting data from the fieldwork. The third phase of the research focused on analysis, using Statistical Package for Social Sciences (SPSS), which helped collate and interrogate the large volume of data collected during the research. The methodology applied to this study has been predominantly quantitative, due to the fact that findings were expressed in, figures, tables, charts, graph and the like, directed at developing a deeper understanding of the health and safety issues faced by casual workers.

The targeted respondents were contractors who have active sites, project engineers, project managers, foremen and casual workers on these sites. A total of 100 construction firms in Kumasi were targeted to respond to a set of close-ended questionnaires and the main information sought from these key respondents were on:

- provisions of welfare facilities and safety materials; and
- benefits and concerns of engaging casual workers

The questionnaires were distributed and retrieved in person, while SPSS was used to analyse the data by ranking some of the health and safety issues evolved from literature. Relative frequency and percentages was used to determine occurrences and the magnitude of these health and safety issues, whilst the one sample statistics means of importance and Importance Index was used to rank the variables to determine their importance. Chi squared (χ^2) test was used to determine the significant difference in response from employers and casual workers.

1.7 DISSERTATION CONTENTS

The study has been organized into six chapters.

Chapter one is the general introduction of the study and it is grouped into:

- introduction to the study which consist of statement of the problem and why the study in Kumasi;
- research goals which contains the aim, objectives and research questions of the study;
- outline of methodology of the study; and
- the guide to the study

Chapter two of this study deals with literature review on occupational health and safety issues of casual workers, particularly in Ghana, and by drawing on health and safety issues of casual workers of other developing countries.

Chapter three dwells on the international legislations and policies of occupational health and safety (OHS) in the construction industry in relation to labour, and thereafter the literature on the Ghanaian legislations and policies and its implications on casual workers. The international legislations and policies are important because most of the national laws and regulations on labour are often based upon international conventions, agreements, declarations.

The focus of chapter four was to combine the observations, assertions and conventions that emerged from the literature review on OHS issues involving casual workers and thereafter, develop a model to become a framework of the study.

Chapter five forms the core part of the study and it consists of analysis of data and its discussions expressed in texts, figures, tables, charts graph and the like.

Finally, chapter six is the concluding part and hence the end product of the study. Again the chapter is tied closely to some portions of the general introduction of this study.

1.8 SUMMARY

The introduction of the study including the research goals, the outline of the methodology and the guide to the study has been presented. The next chapter, (i.e. chapter two) introduces a critical review of occupational health and safety issues of the casual worker in the construction industry in Ghana and other developing countries.

CHAPTER TWO

THE CONSTRUCTION INDUSTRY AND CASUALISATION

2.0 INTRODUCTION

The chapter presents the overview of the Ghanaian Construction Industry, its significance in terms of Gross Domestic Product (GDP) and employment. This is followed by the general overview of the situation of casual workers in Ghana in relations to their engagement into the construction industry having considered their economic challenges and the opportunities that exist for them. The working rules and agreements relating to casual work are also discussed. The elaborations in this chapter provide the background to health and safety for the Ghanaian casual worker, and the summary provides key questions arising from the literature. To begin with, the chapter first deals with the overview of construction industry in Ghana.

2.1 OVERVIEW OF GHANAIAN BUILDING CONSTRUCTION INDUSTRY

The construction industry, according to Anaman et al (2007) adopted from Lange and Mills (1979), is defined as a group of firms with closely related activities involved in the construction of real estates, building, private and public infrastructure. It also deals with all economic activities directed to the creation, renovation, repairs or extension of fixed assets in the form of buildings, land improvements of an engineering nature and other such engineering constructions such as roads, bridges, railways, ports, dams. In Ghana, Civil Engineering firms undertake some of the aforementioned projects which involves heavily engineering characteristics such as bridges, roads, railways and dams, while the Building Construction Firms (BCF) also undertake projects such as the construction of schools, hospitals, health centres, hotels, offices. BCF also undertakes external works which sometimes involved “simple” engineering construction such as drive ways.

The Ghanaian building construction firms comprises of a large number of enterprises of various sizes as registered and categorised by the Ministry of Water Resources, Works and Housing (MWRW&H) as D1K1, D2K2, D3K3 and D4K4. Based on factors such as annual turnover, equipment holding, personnel, the D1K1 class of contractors are termed as larger firms, where as D2K2 construction firms are medium and D3K3 and D4K4 are small firms (Edmonds et al, 1984). The larger firms, according to MWRW&H are registered as financial class 1, capable of undertaking projects of any value, class 2 (the medium firms) are capable of undertaking projects up to US\$500,000 or GH¢750,000.00, while the small firms (financial class 3) are also capable of undertaking projects up to US\$200,000 or GH¢ 300,000.00 or class 4 to undertake projects up to US\$75,000 or GH¢112,500.00

Egmond et al (2007) reported that, the large and medium Ghanaian construction firms forms about 10% of the total number of construction firms registered with the Ministry of Water Resources, Works and Housing. These firms, according to Egmond et al (2007) do not have the appropriate technological capabilities, plant and equipment and key personnel to handle awarded projects properly and the evidence is by the fact that the nation's major construction projects are awarded to the very few large foreign contractors. The remaining 90% are the small firms or small contractors of which in 1999, their total number was 7095. As indicated earlier on these small firms engage in simple construction work with contract sum not exceeding US\$ 200,000 or GH¢300,000.00 in public jobs, and their total construction output ranges between 10% and 20% as compared to large and medium firms. Egmond et al (2007) suggest, that the proprietors of these small firms have little or no knowledge in the building construction industry and their perception about industry is a money making business and the only requirement is your financial ability. From this perception, it is possible that management of these small firms do not really pay attention to labour resource management which is one the key factor for performance and growth of a firm (Mitullah et al 2003).

In terms of occupational health and safety (OHS) in the construction industry, Kheni (2008) found, owners or managers of most construction firm have little or no knowledge of the legal frame work governing OHS. Earlier indication from Danso (2005), is that most firms in the construction sector in Ghana do not have safety policy and had poor safety awareness. Writing in similar vein, Quarm (2000) suggests that most building construction firms in Ghana, in terms of organizing, do not have safety department and safety representative from the government on site to deal with safety related issues. Further, Fugar (2009) asserted, most of the construction firms do not have Human Resource Management (HRM) departments together with its associated health and safety personnel to also deal with safety issues. This has led the owners /managers and operational managers to perform health and safety personnels functions without any specialist input. The management and the operations of these large, medium and small firms are different, however one of the similarities that exist between them is the employment of casual workers, who play a vital role in the process of economic growth and development of a country (ILO, 2003).

2.2 THE SIGNIFICANCE OF THE GHANAIAN BUILDING CONSTRUCTION INDUSTRY

The construction industry plays an important role in any economy and its activities are also vital to the achievement of the socio-economic development goals of providing shelter, infrastructure and employment (Anaman and Osei Amponsah 2007). Indeed, the interdependence between the construction sector and the economic development has been addressed by various writers and in all cases, there is evidence indicating a direct link between investment in construction and economic growth. For instance in an extensive study by Lopes (1998), it was revealed that countries that invest at least a minimum of 4% in construction industry are likely to grow faster in their Gross Domestic Product (GDP).

In Ghana, just like many other developing countries the industry is playing a vital role in socio-economic development goals, providing shelter, infrastructure and employment and above all contributing significantly to the GDP of the country. For instance, since 2003 to 2008, the industry has consistently provided an average GDP growth of 6.1% to economy. Table 2.1 and Figure 2.1 below indicate the contributions of the construction industry to the Ghana's GDP

Table 2.1: Construction Industry Contribution to GDP

Year	Sector growth rate %	GDP %
2003	6.1	5.2
2004	6.6	5.8
2005	7.0	5.8
2006	8.2	6.2
2007	10.3	6.3
2008	11.0	7.3

Source: ISSER 2005, IYF 2009, IMF 2009, DI 2009

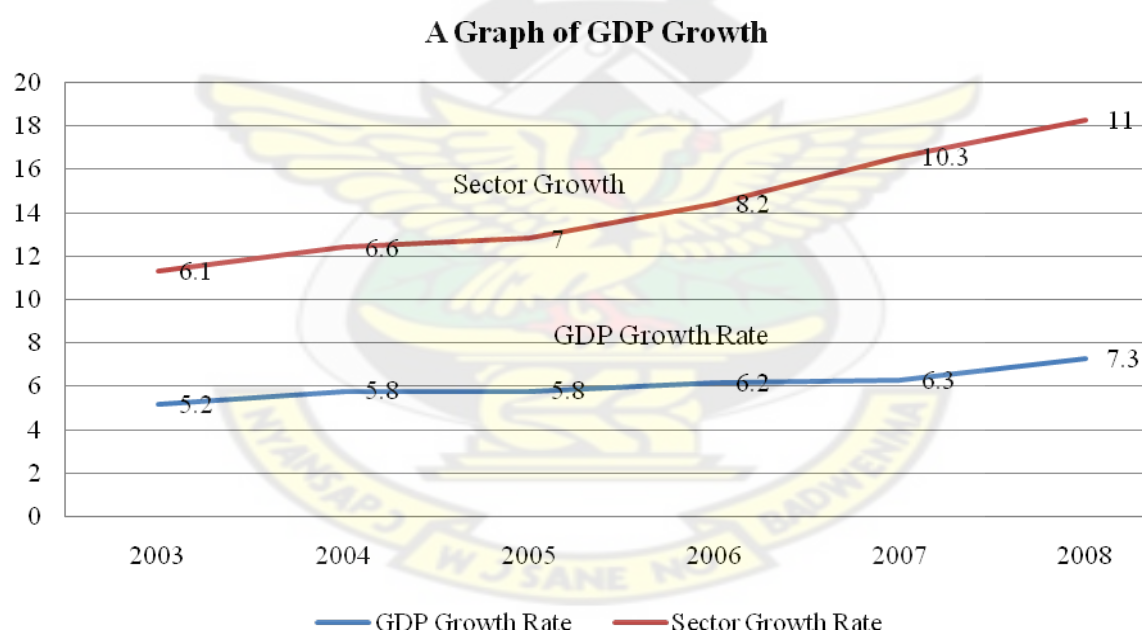


Figure 2.1: Contributions Construction Industry to GDP

From the graph (Fig. 2.1), the construction industry in Ghana, as at 2003 had a GDP growth of 5.8% and experienced a constant GDP growth of about 5.8 % from 2004 to 2005. This remarkable consistent growth increased to 6.2 % in 2006. In 2007, it had picked up again from 6.2 % and peaked at 7.3% in 2008. Further, Anaman et al (2007) did an extensive study by

monitoring the subsector growth of construction industry with other sectors. Anaman et al (2007) concluded that the construction sector is the third fastest growing economic sector based on value added to GDP and that the construction industry outstripped the manufacturing industry 2004.

Besides these important GDP contributions, the construction industry in Ghana has a huge potential of contributing to employment creation. For example, Aryeetey (2004) noted that within the active working population of 15-64 year-olds in the formal sector, construction employment increased from about 22,400 in 1980 to about 23,200 in 1985. Further evidence from the Ghana Living Standards Survey (GLSS) indicate that the construction sector in 1991/1992 accounted for 1.2% of active working population of 602,000, and in 1998/1999 it accounted for 1.4% with the active working population of 102,000. Table 2.2 together with its graph in figure 2.2 below shows the growing trend of construction employment over a given period of about 17years.

Table 2.2: Growth of Construction Employment in Ghana

Year	Urban in (%)			Rural in (%)			Ghana in (%)		
	Males	Females	All	Males	Females	All	Males	Females	All
1991/92									1.2
1995							2.5	0.1	1.2
1997									2.0
1998/99							2.8	0.2	1.4
2000									2.5
2003									3.9
2005/06	6.8	0.2	3.5	1.8	0.0	0.9	3.5	0.1	1.8
2007/2008									2.3

Source: (GSS, 1995), (GSS, 1998), (GSS, 2000A), (GSS, 2002), (GSS, 2003), (GSS, 2008)



Figure 2.2: Trends of Construction Employment

From the graph (Fig. 2.2), the construction sector experienced a constant employment growth of about 1.2% from 1991 to 1995. Employment growth increased from 1.5% in 1995 to about 2% in 1997. Between the periods of 1999 to 2008 constructions employment has significantly grown between 1.4% and 3.9% (GSS 1995; GSS 2008). Indeed, it can be seen that, the construction sector over the years in Ghana has proven to be a source of employment to individuals.

By observation, the employment of casual workers within construction sector in Ghana is increasing and like many construction economies, construction firms rely enormously on the use of casual workers. Before proceeding to review casual workers in the Ghanaian construction industry and the situation of their occupational health and safety issues, it is appropriate to review what pertains in other developing countries given the similarities in construction processes that exist in all developing countries.

2.3 CASUAL WORKERS AND THE GHANAIAN CONSTRUCTION INDUSTRY

The fragmented nature of the construction industry, its transient nature and especially the fluctuating nature of jobs execution makes it unattractive for contractors to keep a lot of permanent workers, making construction firms rely enormously on the use of casual workers (Africa Development Report, 2007). Before proceeding, it would be appropriate to define and to understand who a casual worker is.

The Ghana Labour Act 651, 2003, defines a casual worker as a worker who is engaged to work temporarily for a period not exceeding six (6) months, and whose remuneration is calculated on daily basis. It has been observed that this type of employment in the Ghanaian construction industry has increased over the years with its accompanying occupational health and safety issues.

Interestingly, very little research on the real occupational health and safety issues confronting casual workers in the Ghanaian construction industry has been done. However, literature available indicates that the presence of casual workers in the construction industry is fraught with many shortcomings. As noted early on, within 2.3% of the active workforce (see Table 2.2, pp 14) in the construction sector is a considerable proportion of workers who cannot read and write and contributing significantly to the country's Gross Domestic Product (GDP). This assertion is buttressed by the fact that Egmond et al (2007) pointed out that the Ghanaian construction industry is dominated with many workers who are not able to read and write, and in its report, GLSS (2008) noted that within Ghana's population of about 22.2 million is a large pool of cheap unskilled workers with low level of education.

Again, Kheni (2008) noted the negative attitudes and indifference of site workers in general to health and safety and seems that the negative attitudes and indifference of site workers, stem from the prevailing socio-economic conditions in Ghana. This was briefly expressed by a site worker.

“Our workers union sign a collective agreement with the management, and the agreement consists of salaries, working conditions, health and safety, and welfare of workers. However, our major concern is salaries, once the workers agree on the salaries; the other areas are not of much concern to us”.

In a preliminary survey conducted by the researcher in Kumasi Metropolis in 13th December 2010 as to who was responsible for medical costs involving work related accidents, one casual worker responded that:

“If the constructor is kind, he gives us some money; otherwise in most cases, we have to spend our own money for all treatment fees.”

As indicated earlier, currently, there is no documented data on such issues on casual workers in the Ghanaian construction industry. However given the similarities in the construction industries in some developing countries such as Tanzania, Kenya, South Africa there is little doubt that the trends observed might be different in Ghana since Ghana is also developing country. the section introduces the casualisation in other developing countries

2.4 CASUALISATION AND THE CONSTRUCTION INDUSTRY IN DEVELOPING COUNTRIES

Rasell et al (1997) in their view defined casual work as a non-traditional employment in the absence of regular full-time work and it is characterised by non continuing work. Some writers have concluded that the services of these workers are temporal. They are required when the need arises, and are laid off when the assigned task (the task period is usually short) is over (Sheehan et al 2006; Brooks, 1985; Carter, 1990; Creighton et al, 1994; Dawkins et al, 1990). Buchanan (2004) defined casual worker as an individual who is hired on temporal basis, often for one day at a time. Mitullah et al (2003) further defined a causal worker to include all construction workers who are employed on a casual or temporal basis without any proper form of contract.

Thus individual workers, either working alone or in groups, who undertake temporal work without any contract, are known as casual workers, labourers, temporary workers or day labourers.

Turning back to casualisation and the construction industry, Buchanan (2004) draws attention to the fact that casual workers obtained work by congregating on street corners or in parking lots in close proximity to building supply stores, or at other informally designated spots where contractors know to look for hired help. In Nigeria, Aladekomo (2004) noted that groups of casual workers arrive at road intersections as early as 6.00 a.m. in the morning carrying their baskets or bowls, cutlass, shovel and digger, to be picked up by contractors / builders for the day's job of bricklaying. However, the ILO (2001) has indicated that, the increasing number of casual workers and with its accompanying practice of high rate of hiring by contractors has led to a profound effect upon occupational health and safety issues.

2.5 EVIDENT OF INCREASE OF CASUAL WORKERS IN CONSTRUCTION INDUSTRY

The extent of the employment of casual workers in the construction industry in developing countries has been documented by some researchers (for example Mitullah et al, 2003, Wells, 2007), and there is evidence to show that the practice has grown in recent years. For example, in Sri Lanka, studies on building sites revealed that 82 per cent of the skilled workforce and 93 per cent of the unskilled workforce are employed as casual workers (Jayawardane et al, 1998). Vaid (1999) also indicated that, an estimated 73% of construction workers in India were recruited on casual basis. Again, the proportion of casuals in Malaysia increased slightly from 71% in 1983 to 74% in 1998 (Abdul- Aziz, 2001). The trend is not different in Philippines, where construction companies continue to downsize their regular workforce. It is estimated that 85 per cent of the 1.35 million wage and salaried workers in the construction industry in January 2000 were casual

workers or project-based employees (Yuson, 2001). In India, Wells (2007) reported that casual workers in the construction workforce increased in 10 years between 1983 and 1993. In 1993, 64% of men were employed on casual basis in urban construction as compared to 58% in 1983. Wells (2007) further reported Mexico and Republic of Korea have about 64% and 77 % of casual workers on construction sites. In that same report Wells (2007) indicated, 90% of construction workforce in Egypt are hired on casual basis.

Mitullah et al, (2003) also indicated that there is a high level of casualization on all the construction sites in Tanzania. At least 70% of workers on each site were found to be employed on casual basis and on some sites the number is as high as 96 per cent. One may be tempted to ask why these increases? Are they any peculiar characteristics about them? In an attempt to answer this question, the next sections deal with the characteristics of casual workers and their economic and social background.

2.6 CHARACTERISTICS OF CASUAL WORKERS IN CONSTRUCTION INDUSTRY IN DEVELOPING COUNTRIES

The ILO (2001) reported that the construction industry has the ability to “absorb the excluded”. The understanding gathered is that, the industry provides employment for those with little education or skill, and most often than not, these are from the poorer sections of the society. In the same report, the ILO established that almost all of the casual workers in Indian construction sites are young from the lower social group and poorly educated, and significantly a large number of these workers in the urban centres were found to have had no schooling.

The ILO (2001), cited Zylberstajn (1992), that in Brazil, casual workers in the construction industry have a lower educational level than workers in other sectors and the Brazilian construction industry do not even require any average level of education from its site workers. Earlier, in 1999, 14.6 percent of the construction workforce was found to be illiterate

and 57 % had less than four years of schooling (ILO, 2001). The situation is very similar in China where 50 per cent of the 600,000 migrant workers on construction sites in Beijing have received no more than primary education and over 10 per cent are illiterate (Lu and Fox, 2001)

2.6.1 The Skills of Construction Workers in Developing Countries

The construction sector generally has been described more relatively as labour – intensive in the sense that it uses a larger number of workers per unit of output than most of the other industrial sectors. For example in the manufacturing sector, labourers account for about 30-40% of the total workforce, while in the construction sector, construction labourers constitutes 75-80% of the total workforce (Edmonds et al, 1984; Habitat Intl, 1983). The labour – intensive work within the construction sector was confirmed in the 2001 ILO's report which noted "*despite mechanization, the industry is still largely labour-intensive especially in developing countries.....*"

The construction workforce is classified into three groups according to skills: unskilled, semi-skilled and skilled. It is worth noting that to a large extent, the construction industry is characterised by its high numbers of unskilled workers (John Van Riju, 2004). In the process of industrialization and urbanization, construction work most often than not provides an entry point for migrant workers and statistically, construction work is often one of the significant alternatives to farm labourers who do not have any particular skills (ILO, 2001). This reason and others have provided employment for rural-urban migrants in many developing countries. For instance, Grandi (1985, cited in ILO 2001) asserted that, in Brazil during the process of rapid urbanization between 1960 and 1980, an estimated 30 million people left various rural centres for urban areas and most of them joined the construction industry without skills or knowledge about the construction industry. Further in his surveys in São Paulo and Rio de Janeiro in 1985, he found out that, the total migrants in construction workforce were 98 percent and 94 percent

respectively. A high proportion of these workforces were from the north-east region, the poorest in the country.

A similar process happened in India, where about 670 unskilled workers on 11 construction sites in Delhi in 1999 were found to have migrated from the less developed towns to urban centres, and the two major reasons given for this migration were unemployment and poverty (Anand, 2000).

In China, the booming construction industry is drawing on surplus labour from the rural areas. Employment on construction sites in the towns is the only way for those displaced by increased agricultural productivity to gain some income. The urban construction companies depend on rural labour, and in 1996 the construction industry in Beijing alone employed a total of 424,000 workers from 49 different provinces. By 1999, the number had risen to 640,000 migrant workers coming from 60 different provinces (Lu and Fox, 2001). Indications from Lu and Fox publications are that most of these migrant workers do not have any skill to the construction industry.

2.7 OHS ISSUES OF CASUAL WORKERS ON CONSTRUCTION SITES OF DEVELOPING COUNTRIES

It has been indicated that (see section 2.4 of this chapter), indeed there has been a significant growth of casual workers in the construction industry. However, the ILO (2001) has indicated that the increasing number and the practice of casual workers have led to a debilitating effect upon occupational health and safety issues on construction sites. For example, in India, the on-site accommodation provided for casual workers is rudimentary, comprising simple shacks with no running water or decent sanitation, and poor ventilation (Vaid, 1999). The same can be said about Malaysia where it has been estimated that 82 per cent of casual workers live on sites in

buildings of poor quality, and this was their second major grievance after social security (Abdul-Aziz, 2001).

Again, it was further established by ILO (2001) that, accidents on Malaysian construction sites are so common that everyone has come to accept them as an unavoidable feature of the industry. It was suggested that the situation was due to the casual terms of employment and the non coverage of workers under Malaysian National Insurance Scheme. Even China as an emerging developed nation, the trend is not different. The bulk of casual workers on construction sites, lack proper places to have their meals and they are often found eating outdoors, exposed to dust in the air, without dining tables or seats (Lu and Fox, 2001). Additionally, Jeemol et al (2002) indicated that casual workers have a problem of meeting their basic needs such as food, shelter. A base study conducted in Tanzania by ILO, (2005) revealed that casual workers were not provided with welfare facilities in most of the projects.

During ethnographic study on casual workers, Buchanan (2004) also found that casual workers are unwilling to leave dangerous work situation because;

- There are a lot of casual workers waiting to be employed and they worried they would be replaced if they complained about safety hazards.
- Most casual workers have families and they have to take care of them.

The other challenging issues of casual workers among others to occupational health and safety (OHS) issues have been lack of:

- protection mainly in terms of enforcements of minimum wages and other terms of employment such as leave, housing, . which are not there due to lack of a representation in collective bargaining process; and
- Social protections of the casual labourers in the form of terms and conditions of employment. This means that the casual workers have no protection from the law against dismissals, sickness, old age and incapacity (ILO, 2001, Mitullah and Wachira, May 2003)

Some other researchers have tried to assign some other reasons to the poor state of the casual workers especially in the area of training and provision of safety equipments. Philips (2000) was of the view that contractors were reluctant to invest in training because of the chances of losing workers to other firms or other countries. Susan et al, (2008) concluded employers are of the view that, investing in casual workers has less of a long-term return for their businesses. Indeed from this statement, it appears it may not be profitable to use resources to train a casual worker only for him or she to leave after the assigned task is completed. Again, the ILO (2003) asserted that the high turnover of casual workers poses a considerable barrier to training among others in the construction industry. In Philippines, the International Federation of Building and Wood Workers (IFBWW 2005, cited in ILO 2001) attributed their 32 and 40 fatalities of construction accidents in 1997 and 1998 respectively to lack of training, information, provision of safety equipment and welfare facilities to casual labourers, resulting in poor safety record.

2.8 THE EMPLOYER AND CASUALISATION IN DEVELOPING COUNTRIES

Susan et al, (2008) published that casualisation offers the contractors the flexibility in the recruitment of labour. It enables them to get the labour they require when they need it and to pay for it. Flexibility is particularly important in the construction industry due to fluctuating labour requirements and the transient nature of the labour itself (ILO, 2006). It has been suggested by ILO (2001) that neither construction products nor skills are homogeneous. This means, that building construction in particular requires a variable mix of skills because the labour requirements of one contract differ from the other (Fugar, 2009). Again, availability of work load coupled with limited time to complete a won contract is sometimes difficult (Fugar, 2009), thus the use of casual workers provides an easy way for adjusting to the labour on site. Further, for many employers it can be cheaper to hire casuals because they are not entitled to non-wage benefits, they are not restricted to a minimum number of hours per day, and their dismissal can

be achieved without severance payments (Tucker 2002). Additionally, some employers as a strategy employ skilled casual workers to increase labour profits. This is because employers have noticed that casual workers are cheaper to employ and they are not entitled to non-wage benefits (IFBWW 2004, cited in ILO 2001). Susan et al, (2008) further indicated that employers may also choose to use casual employment for:

- In the absence of their “core” employees;
- trying out workers before engaging them as permanent employees; and
- ‘buying in’ specific skills and knowledge. (This implies that the onus is on the casual employee to come fully equipped with the necessary skill set.)

2.9 EMERGING ISSUES AND FACTORS FROM THE LITERATURE REVIEW

Having observed some of the problems and challenges facing casual workers and their general conditions on construction sites in some developing countries, the emerging issues concerning casual workers can be grouped into:

- welfare issues of casual workers;
- socio-economic conditions of the casual workers; and
- employers’ benefits and concerns of engaging casual workers

However, in this study, the socio-economic condition is defined to include the social background of the casual worker.

2.9.1 Welfare Issues

There is general assertion from this chapter that, contractors do not provide welfare related facilities such as safe drinking water, means of heating food, water for washing and cooking, suitable accommodation for resting, catering services, sanitary facilities, accommodation to

change and store clothing, and first-aid to casual workers on construction sites in most of the developing countries (Vaid, 1999, Abdul-Aziz, 2001, Lu and Fox, 2001, Jeemol et al 2002, ILO, 2001, Mitullah and Wachira, May 2003)

2.9.2 Socio-Economic Condition

Casual workers on construction sites in most of developing countries were found to have low or no education. This means that most of them cannot read to understand the law governing them, and let alone demand their rights. One of the principal problems of casual workers identified is the non-payment of social security by their employers. This and others made Wells (2007) to conclude that casual workers received no protection from the law against dismissal, sickness, old age or incapacity, and even when they are paid it is not well enough. In the quest of casual workers meeting their basic needs such as food, shelter, most of them have entered into the construction work without having knowledge about the industry, especially in area of health and safety norms. These are some major issues confronting casual workers in the construction industry in the line of socio-economic condition. Nevertheless, some employers seem to have some benefits and concerns in engaging casual workers and the next section highlights some of these benefits and concerns.

2.9.3 The Benefits Factors

Casual workers are readily available when their services are needed and they are cheaper to employ. These reasons coupled with the fact that casual workers are lower wage earners, means by which employers are able to make savings on labour. Some employers in developing countries enjoy the benefit that casual workers are alternative to permanent worker and others employ casual workers as of means of recruiting specific skills and knowledge they need (IFBWW 2005, cited in ILO 2001, . Philips (2000, Susan et al, 2008)

2.9.4 Concern Factors

Some employers are of the view that investing in casual workers in areas such as training, has less of a long-term returns for their firms. Others think that, the invested casual worker could easily be lost to other firms. It was also realised that it was expensive to train casual workers considering the high turnover of casual workers in the construction industry.

2.10 SUMMARY

This chapter has review literature on occupational health and safety issues on casual workers for a deeper understanding of their health and safety related issues in the construction industry in some developing countries. The chapter has also revealed the situation of casual workers in construction industry in other developing countries in terms of educational, employment, skills, economic, social and occupational health and safety issues of casual workers. The chapter has also indentified some benefits and concerns of engaging casual workers by some employers. Notwithstanding, this chapter has also revealed the challenges of casual workers on construction sites in some developing countries. The literature has indicated that very little research on the real occupational health and safety issues confronting casual workers in the Ghanaian construction industry has been done..

Given the conditions of casual workers in the construction industry and their contributions to national economies as demonstrated in this chapter, there is wonder whether there are laws to protect these workers in their daily execution of their jobs. The next chapter therefore, gives an insight into the legislations and policies put in place to protect workers by the International Labour Organisation (ILO), with special reference to Ghana labour laws in relations to casual workers in the construction industry.

CHAPTER THREE

LEGISLATIONS AND POLICIES OF OCCUPATIONAL HEALTH AND SAFETY IN THE CONSTRUCTION INDUSTRY

3.0 INTRODUCTION

This chapter acknowledges the international legislations and policies of occupational health and safety (OHS) in the construction industry in relation to labour and thereafter review the Ghanaian legislations and policies and its implications on casual workers. The international legislations and policies are important because most of the National laws and regulations on labour are often based on international conventions, agreements, declarations. To this end, the legislations and policies of occupational health and safety (OHS) on labour from the International Labour Organization (ILO) set the tone to review Ghana's safety legislation.

3.1 WHAT IS OCCUPATIONAL HEALTH AND SAFETY?

Health is a sound state of the body and mind of people from illness resulting from the materials, processes or procedures used in the workplace, while safety is the protection of people from physical injury (Hughes et al, 2008). Thus occupational health and safety (OHS) can be seen to concern the physical and mental well-being of the individual at a place of work. Workplace in the construction industry is most often than not referred to as construction site. Therefore, occupational health and safety issues become a primary concern to governments, employers, employees, and project participants alike, as construction activities are likely to adversely affect the health of both construction workers and other persons on construction sites.

3.2 OVERVIEW OF THE INTERNATIONAL LABOUR ORGANISATION

The International Labour Organization (ILO) is a specialized agency of the United Nations. It was established in 1919 with the principal objective of protecting Human Rights of workers and to promote decent work for all races. The organization drafts and adopts conventions, with its recommendations to all member states that have accepted the ILO conventions, and are in pursuance of its aims and objectives. The ILO combines standard-setting, among other things, to all member states who have adopted, pledged to respect and promote human rights.

To this effect, in 1988, the Health and Safety in Construction Convention (No. 167) and its associated Recommendations (No. 175) were adopted to serve as a blue print upon which legislations and policies of member states' health and safety issues would be built on. The enactment of the law on occupational health and safety in the construction industry was necessary to reflect the broad approach in tackling the health and safety problems in the construction industry. Complementing this law is the ILO Code of Practice on Health and Safety on Construction sites which was also approved in 1992.

3.3 THE CODE OF PRACTICE ON HEALTH AND SAFETY ON CONSTRUCTION SITES (ILO 1992)

Generally, a code of practice is a set of rules according to which people in a particular profession are expected to behave or practise. The ILO's Code of Practice on Health and Safety on Construction site provides guidelines in the implementation of the Health and Safety practise on construction sites for all workers including casual workers. The document outline the steps that have to be taken, among others to provide adequate welfare facilities, personal protective equipment appropriate for a job and provision and maintenance of safe working environment to all workers on site. Salient portions of the code relevant to this study are explained and presented below.

3.3.1 Welfare Facilities

Under the general provisions of welfare facilities, it writes “at or within reasonable access of every construction site, the following facilities should, depending on the number of workers and the duration of the work, be provided, kept clean and maintained:

- sanitary and washing facilities or showers;
- facilities for changing and for the storage and drying of clothing;
- accommodation for taking meals and for taking shelter during interruption of work due to adverse weather conditions”

3.3.1.1 Sanitary Facilities

The Sanitary facilities are defined to include toilet, privies, chemical closet. The understanding from the document is that, the provision, the construction and the installation of these facilities should comply with the requirements of the authorities (laws of the land). Further, no toilet other than a water flush toilet should be installed in any building containing sleeping, eating or other living accommodation, and should be adequately ventilated and not open directly into occupied rooms. Adequate washing facilities should be provided as near as practicable to toilet facilities.

3.3.1.2 Washing facilities

The rules governing washing facilities (e.g. shower-bath) are that, the number and the standard of construction and maintenance of washing facilities should comply with the requirements of the authorities. Washing facilities should not be used for any other purpose and where workers are likely to be exposed to skin contamination by poisonous, infectious or irritating substances, or oil, grease or dust, there should be a sufficient number of appropriate washing facilities or shower-baths supplied with hot and cold water.

3.3.1.3 Cloakrooms

A cloakroom, or sometimes referred to as coatroom, is by definition a room where coats and other articles may be left temporarily (Harris, 2005). On construction site, the cloakroom is normally part of the site accommodation provided by the main contractor and it should be provided for all workers at easily accessible places and not be used for any other purpose. Cloakrooms should be provided with suitable facilities for drying wet clothes and for hanging clothing. Where necessary the contamination of the room should be avoided. Suitable lockers separating working from street clothes must be provided. Suitable arrangements should also be made for disinfecting cloakrooms and lockers in conformity with the requirements of the authorities.

3.3.1.4 Drinking Water

The code requires that, contractors must provide enough water for all workers and the treatment of the drinking water will be as follows. All drinking water should be from a source approved by the authorities. Where such water is not available, the authorities should ensure that the necessary steps are taken to make any water to be used for drinking fit for human consumption. Drinking water for should be stored in closed containers only, from which the water should be dispensed through taps or cocks. If drinking water has to be transported to the worksite, the transport arrangements should be approved by the authorities. The transport tanks, storage tanks and dispensing container should be designed, used, cleaned and disinfected at suitable intervals in a manner approved by the authorities. Water that is unfit to drink should be conspicuously indicated by notices prohibiting workers from drinking it. A supply of drinking water should never be connected to a supply of water that is unfit to drink.

3.3.1.5 Facilities for Food and Drink

Contractors are required in appropriate cases, depending on the number of workers, the duration of the work and its location, adequate facilities for obtaining or preparing food and drink at or near a construction site should be provided, if not otherwise available. The facilities should be hygienic and located in hygienic environment.

3.3.1.6 Living Accommodation

The code of practice requires that suitable living accommodation should be made available for all the workers at construction sites which are remote from their homes. Adequate transportation between the site and their homes should be provided, and where this is not possible other suitable living accommodation should be provided. Men and women workers should be provided with separate sanitary, washing and sleeping facilities.

3.3.2 Personal Protective Equipment and Protective Clothing

Under this provision, employers were to note that suitable personal protective equipment and protective clothing, having regard to the type of work and risks, should be provided and maintained by them without cost to the workers. Also under this provision, personal protective equipment and protective clothing should comply with standards set by the authorities, taking into account as far as possible the ergonomic principles. Further, employers should provide the workers with the appropriate training to enable them to use the individual protective equipment, and should require and ensure its proper use.

3.3.2.1 Types of Protective Equipment and Protective Clothing

Employers are required by law to provide all workers including casual workers with the following personal protective equipment and protective clothing on site.

- safety helmets or hard hats to protect the head from injury due to falling or flying objects, or due to striking against objects or structures;

- clear or coloured goggles, a screen, a face shield or other suitable device where workers are likely to be exposed to eye or face injury from airborne dust or flying particles, dangerous substances, harmful heat, light or other radiation, and in particular during welding, flame cutting, rock drilling, concrete mixing or other hazardous work;

- protective gloves or gauntlets, appropriate barrier creams and suitable protective clothing to protect hands or the whole body as required, against heat radiation or while handling hot, hazardous or other substances which might cause injury to the skin;

- footwear of an appropriate type when employed at places where there is the likelihood of exposure to adverse weather conditions, or of injury from falling or crushing objects, hot or hazardous substances, sharp-edged tools or nails and slippery or ice- covered surfaces;

- respiratory protective equipment, suitable for a particular environment, where workers can be protected against airborne dust, fumes, vapours or gases by ventilation or other means;

- a suitable air line or self-contained breathing apparatus when employed in places likely to have an oxygen deficiency;

- respirators, overalls, head coverings, gloves, tight-fitting boiler suits, impermeable footwear and aprons appropriate to the risks of radioactive contamination in areas where unsealed radioactive sources are prepared or used; and

- waterproof clothing and head coverings when working in adverse weather conditions

From the above section, it can be concluded that the legal framework (i.e. the ILO's Code of Practice on Health and Safety on Construction site) for construction workers in general is adequate to protect them. This legal framework covers both permanent and casual workers. It does not prohibit or exclude any section of workers from its protection.

As hinted earlier in section 3.2 of this chapter, the Health and Safety Convention (No. 167) and its associated Recommendations (No. 175) were to serve as a blue print upon which all member states would enact their own legislations and regulations to suit their environment. Recent studies show that China, Australia, South Africa and others have developed separate legislation for their construction workers. For example, China has developed a safety document titled “The Construction Law of the People’s Republic of China”. Australia in her “worksafe” campaign has established an Australia Occupational Health, Safety and Welfare Act 1986. Further in South Africa, Occupational Health and Safety Act of 1993 has been established for construction workers. Similarly in Saskatchewan, a province in Canada, has established a regulation titled “*Construction Industry Labour Relations Act of 1992*”. In general all these laws have been established with the prime purpose of protecting construction workers, construction materials, and the provision of guidelines to preventing accident occurring on construction sites.

Baah et al (2006) indicated that Ghana has so far ratified 46 ILO Conventions including Convention No. 167 and its associated Recommendation No. 175. However, it appears that Ghana has not been able to develop a comprehensive separate legislation and policies (in the context of OHS) for her construction workers, but rather it appears the industry depends on the National labour Act 651 of 2003, Factories, Offices and Shop Act of 1970 and Workmen compensation Act 1987 and Building Regulation.

3.4 THE OCCUPATIONAL HEALTH AND SAFETY LEGISLATION AVAILABLE TO THE GHANAIAN CONSTRUCTION INDUSTRY

The Ghanaian construction Industry, according to Anaman et al (2007) was the third largest growing economic sector outstripping the manufacturing industry in 2004 with a constant GDP growth of about 5.8 % from 2004 to 2005. Subsequently, the emergence of Ghana as an oil producing country, the Ghanaian construction industry is projected to grow stronger at an unprecedented rate of 13% (ISSER, 2008). However, it appears that the policy makers in Ghana have different view about the industry and indication from Anaman et al (2007) is that Ghanaian policy makers have not promoted the industry. This means that in the context of policies and legislation, the Ghanaian construction industry have not developed well enough to have a separate legislation like other developing countries (see for instance “The Construction Law of the People’s Republic of China”, The Occupational Health and Safety Act of 1993 of South Africa). Ghana depend only on the:

- National labour Act 651 of 2003;
- Factories, Offices and shop Act of 1970;
- Building Regulation; and
- Workmen compensation Act 1987

For the purpose of achieving the objectives of the study (see chapter one), portions of The National labour Act 651 of 2003 which deals with casual workers and the Factories, Offices and shop Act of 1970 will be reviewed.

3.4.1 The National Labour Act and Casualisation

Generally, part X of the National labour Act 651 of 2003, deals with special provisions relating to temporary worker or casual worker. Section 73 deals with the right of employer to employ certain workers. Section 74 of the Act deals with conditions of employment of a casual worker, while section 78 deals with the interpretation or the meaning of a casual worker. Section 118

explains how employers should manage the occupational health and safety of all employees, and the environment within which they work.

3.4.1.1 Section 73—Right to Employ Casual Worker

Section 73 of the Act allow employers to hire a worker or workers for short periods on terms that suit the operations of their firm. This means that employing workers on casual basis is not prohibited in Ghana. This then contradicts with the Social Security Legislation established under the PNDC Law 247 under Pension Scheme. The scheme discourages “casualisation” in employment relationship between the employer and employee.

3.4.1.2 Section 74- Condition of Employment of Casual Worker

The understanding gathered from section 74 of Act 651 of 2003 is that a contract of employment for a casual worker need not be in writing, but casuals have rights to minimum remuneration for each day worked, overtime and medical facilities. This gives the casual worker the opportunity to enjoy certain facilities such as overtime, medical facilities within the companies they found themselves. Further opportunity is provide for them in the Act to access their full remuneration when they attend work and the weather prevents them from carrying on with their normal work.

However, what appears to be lacking is the kind of benefits entitled to casual workers after undertaking the assigned task based on the fact that the work provided by the employer is seasonal or intermittent.

3.4.1.3 Section 78 –Interpretation of Casual Worker

Section 78 of the National labour Act 651 of 2003 clearly defines who a casual worker is and it reads *“casual worker” means a worker engaged on a work which is seasonal or intermittent and not for a continuous period of more than six months and whose remuneration is calculated on a daily basis”*

It appears that the definition given is unclear and open to abuse. For example what happens if the employer keeps the casual worker for continuously more than six month?

3.4.1.4 Section 118—General Health and Safety Conditions

The National Labour Act 651 of 2003 requires the employer to ensure that every worker employed by him or her works under satisfactory, safe and healthy conditions. This means the employer should provide and maintain the workplace, plant and ensure the work is safe and without risk to the health of all workers including casual workers. Further, the employer should provide the necessary information, instructions, training and supervision, taken into account the age, literacy level and other circumstances of the worker to ensure, so far as is reasonably practicable, the health and safety at work of other workers engaged on the particular work.

Again, according to the Act, it is the duty of employer to supply at no cost to the worker, adequate safety appliances and personal protective equipment. Additionally, the employer should provide separate, sufficient and suitable toilets, washing facilities, adequate facilities for the storage and drying of clothing for male and female workers on site. The employer should further provide adequate supply of clean drinking water at the workplace.

The Act also gives opportunity to all workers on site including casual workers to express their feelings without fear if their safety is threatened. For example, the understanding from section 119 of Act 651 is that, when a worker finds himself or herself in any situation at the workplace which she or he has reasonable cause to believe, presents an imminent and serious danger to his or her life, safety or health, the worker shall immediately report this fact to his or

her immediate supervisor and remove himself or herself from the situation. In such event, the employer shall not dismiss or terminate the employment of a worker or withhold any remuneration of a worker who has removed himself or herself from a work situation which the worker has reason to believe presents imminent and serious danger to his or her life, safety or health. Again, the employer shall not require a worker to return to work in circumstances where there is a continuing imminent and serious danger to the life, safety or health of the worker.

3.4.2 Factories, Offices and Shop Act Of 1970

The factories, Offices and shop Act 1970 is detailed to be preventive measures to health and safety in general. However, certain parts of the sections set out the health and safety standards that are mandatory to the construction industry for all the workers and employers. Salient clauses are cited hereunder as rules:

3.4.2.1 Rule 1-Compliance

The rule is that every contractor or employer shall comply with the requirements designed to ensure the health, safety and welfare of all persons engaged in building operations on building construction sites.

3.4.2.2 Rule 2-Provision on Welfare Facilities

The provision under this Act makes it clear that adequate and suitable accommodation in the form of canteen must be provided by the contractor to contain tables and seats or benches for taking meals, with facilities for boiling water. Where a contractor has more than ten persons in his employment on a site, adequate facilities for heating food must be provided. Further the contractor must provide an adequate supply of wholesome water at convenient point or points, and clearly marked “DRINKING WATER”.

3.4.2.3 Rule 3-Provision on First-Aid

The rule is that employers are to provide first-aid facility for every employee on a work site. It is required by law that employers are to provide first-aid room properly constructed and accessible for purpose of rest and treatment, and it should be operational during working hours. This is applicable to contractors who employ 250 and more employees. There is also a legal requirement that obliges employers to draw Compulsory Insurance against injuries and fatal accidents that may occur at workplaces.

3.5 Emerging Issues from Legislations and Policies

From the National labour Act 651 of 2003, the Factories, Offices and shop Act of 1970 and the ILO Code of Practice on Safety and Health in Construction site, it can be concluded that the legal framework on casual labour practices in the construction industry in Ghana is generally adequate and the employment of workers on a casual (daily) basis is not specifically prohibited in Ghanaian labour laws. However the indication from the blueprints available suggests some lack of understanding or inconsistencies on the real issues confronting casual workers in the construction industry. For example the Social Security Legislation which was established under the PNDC Law 247 under Pension Scheme discourages “casualization” in employment relationships and this makes the casual worker lacks protection of the law in retirement benefits. However, sections 74 – 118 encourage employers to engage casual workers.

Again the legislation above places the responsibility of the health and safety of casual workers on the main contractor and the law and its regulations are quite explicit on the steps that have to be taken in the managing of health and safety provisions such as first-aid facilities, training, protective gear to casual workers. To this responsibility, it appears that lack of monitoring and enforcement, and lack of awareness and the economic and educational challenges

(see chapter 2) on the part of the casual workers has allowed some contractors the freedom to choose how they wish to treat their casual workers, and whether or not they will abide by the regulations of the government in this regard. To this, a framework has to be developed to assess the provision of health and safety materials to casual workers on site by contractors.

3.6 SUMMARY

This chapter has reviewed the legislations and policies of occupational health and safety in the construction industry in relation to guidelines and legislations from the ILO and has further reviewed some portions of the Labour Act 651 in context of casual workers in the construction industry in Ghana. References have been made to ILO construction code of practice and the Ghanaian Factories, Offices and shop Act of 1970. Indications are that the safety laws place the responsibility of the health and safety of casual workers on the main contractor.

To this end, the next chapter focuses on the development of a theoretical framework for evaluating the health and safety issues that confront a typical casual Ghanaian construction worker taking into account issues emerging from chapter two. Further appropriate research methods required for the study to address the OHS of the Ghanaian casual worker are also discussed.

CHAPTER FOUR

THEORETICAL FRAMEWORK AND RESEARCH METHODOLOGY

4.0 INTRODUCTION

Having concluded the literature review, the focus of this chapter is to combine the observations, assertions and conventions that emerged from the literature review to develop a theoretical framework for the study. The theoretical framework will serve as a pivot to evaluate the

occupational health and safety issues of casual workers in the construction industry in Ghana and also set the scene for developing a conceptual framework for the study. Following this, the conceptual framework is used in designing an appropriate Research Instrument for eliciting the relevant data. The chapter also discusses issues relating to how the sampling frame was established and the data used for the analysis.

4.1 THE THEORETICAL FRAMEWORK OF CASUALISATION

As demonstrated in chapter three sections 3.3, the ILO's code of Practice on Safety and Health in Construction site 1992 demonstrates that employers have clear legal obligations to protect any worker under their control or management. To this end, the Ghanaian contractor has legal obligations under the National labour Act 651 of 2003 and Factories, Offices and shop Act of 1970 among other things to:

- Provide and maintain, working environment that is safe and without risks to health;
- Provide adequate information on hazards, as well as instructions, training and supervision to help execute work safely;
- Provide personal protective equipment appropriate for the job; and
- Provide adequate welfare facilities such as amenities and first aid.

Figure 4.1 below, shows the theories that govern the provisions of occupational health and safety materials on construction sites. The National labour Act 651 of 2003 and Factories, Offices and shop Act of 1970 was put together to develop the framework.

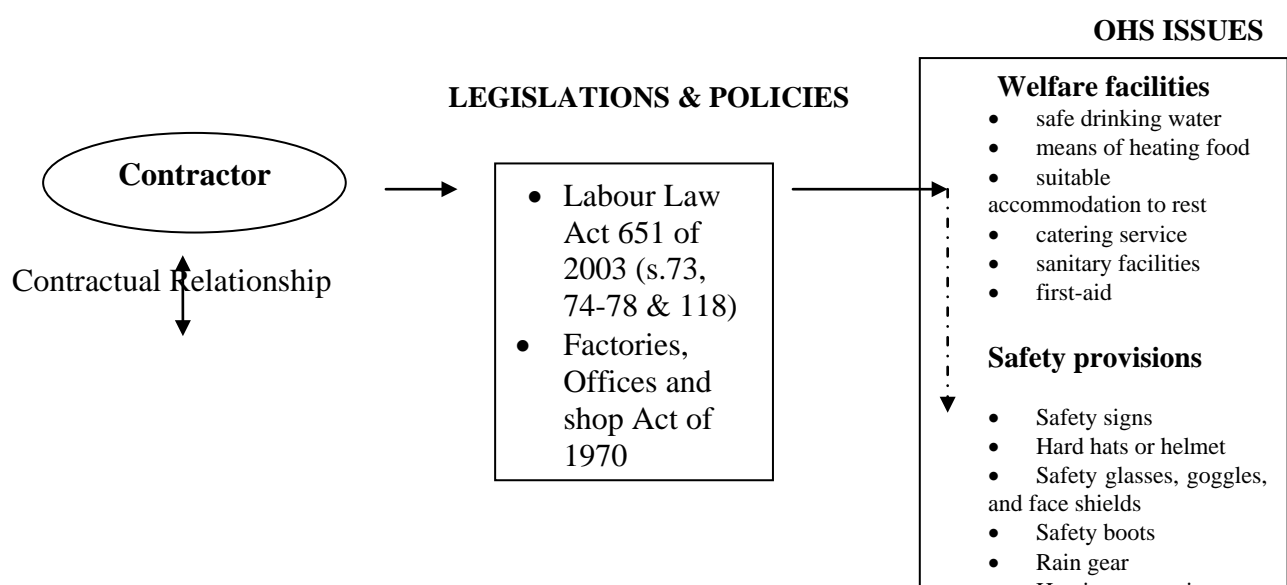




Figure 4.1: A framework of OHS provisions for casual workers

Within the legislation and policies in Fig 4.1 lies the National Labour Act 651 of 2003 and Factories, Offices and shop Act of 1970 and the requirement of the law in the context of OHS is projected form OHS issue (see fig 4.1). Section 73 under the legislation and policies in fig 4.1, deals with the right of employer to employ casual workers, whereas sections 74 and 78 deal with the conditions of employment of the casual worker, and the interpretation or the meaning of casual worker respectively. Section 118 of Act 651 explains how employers should manage the occupational health and safety of casual workers and the environment within which they work.

From the legislation and policies, contractors are allowed to hire casual workers for short periods on terms that suit the operations of their firms, however contractors are to operate within the definition of engagement of a casual worker which is, *“a casual worker should be engaged on a work which is seasonal or intermittent and not for a continuous period of more than six months and his or her remuneration is calculated and paid on a daily basis”*. Once the contractor employs a casual worker, by legislation, a verbal contractual relationship is established, where the casual worker have rights to minimum remuneration for each day worked, overtime and medical facilities. Further opportunity is provided by the legislation for the casual to access full remuneration when he or she attends work, for example whether the weather

prevents him or her from carrying on his or her normal work. The legislation and policies further place the responsibility of provision of welfare facilities and safety materials for the casual worker on the main contractor on site. Portions of the Factories, Offices and shop Act of 1970 only re-echoes the health and safety provisions in sections 118 to 119 of the National labour Act 651.

This legislation and policies as explained in the framework (Fig 4.1), becomes the base line for measuring what the Ghanaian contractor provides for the casual worker and what the casual worker receive from the contractor with regards to occupational health and safety measures. Indeed the framework seeks to confirm the provision and receipt of welfare facilities and safety measures for the Ghanaian casual worker on a construction site, and whether these provisions are implemented is also a subject of this study.

4.2 THE CONCEPTUAL FRAMEWORK

Conceptual framework is a collection of interrelated concepts, like a theory but not necessarily so well worked-out (Borgatti, 1999). Borgatti (1999) asserted that a theoretical framework guides the researcher to determine what things to be measured and what statistical relationships to look out for. Drawing from this assertion, it is appropriate to present a brief of the emerging issues from the literature review and thereafter determine which variable to measure.

Issues emerging from the literature review from some developing countries were grouped into safety and welfare issues of casual workers; socio-economic conditions of the casual worker, and employers' benefits and concern of engaging casual workers. Governing these issues are the

Legislations and Policies of Occupational Health and Safety (OHS) (see sections 2.9, 3.3 and 4.2 of chapters two, three and four)

It was revealed that, welfare facilities such as inadequate accommodation, sanitary facilities, lack of catering services and unsafe drinking water among others, were the major problems confronting casual workers on construction sites, whereas lack of safety provisions such as protective gear, first-aid facilities, working height accessories and training of casual workers on health and safety were also safety problems facing the casual worker (Fig 4.1).

At the socio-economic level, it was revealed that, casual workers in most of the developing countries were unable to meet some of their basic needs such as food, shelter and health. The low level of education of casual workers, high turnover of casuals on construction sites and their quest of hunting for jobs have made them vulnerable to demand for welfare facilities and safety provision. Contractors in most developing countries employ casual workers for 'flexibility' as employee numbers increases or decreases in line with the needs of the business, especially during seasonal work demands. Further, for many contractors, the readily availability of casual workers who are cheaper to hire, gives the employers the opportunity to dismiss and employ casual workers for trivial reasons. The effect of low education together with the economic condition of the casual workers, have made them weak to resist to work in unsafe conditions which otherwise would require safety measures, and also to demand for the payment of social security and better wages. These factors make the employment of casual workers a beneficiary to some contractors. Although no comprehensive data on the above issues exist in Ghana, especially in the construction sector, however given the similarities in the construction industries in those developing countries such as Tanzania, Kenya, South Africa , there is little doubt that the trends observed might be different in Ghana. Thus, the economic and social behaviour of both employers and casual workers, together with the available legislation and policies on

occupational health and safety set the agenda for developing a framework to evaluate the situation in Ghana.

4.3 METHODOLOGY ADOPTED

As noted earlier, the aim of this research is to study the occupational health and safety of the Ghanaian casual worker on the building construction site and figure 4.1 of this chapter illustrates the basis upon which the research instrument is designed and the kind of respondents selected. Generally, to achieve the aim of a study, one of the important areas to consider is the kind of method that is adopted (Naoum, 2001). For this reason, the researcher employs a range of complementary research methods to the study. The three phases upon which these methods were applied to are;

- preliminary phase;
- second phase; and
- analysis of data phase

4.3.1 Preliminary Phase

The background information on casual workers was gathered from literature and the sources of the reviewed literature were in two categories:

- **Primary source** : - These include field survey, both formal and informal, face to face unstructured taped interviews and discussions with contractors, site engineers, site supervisors and casual workers on building construction sites;
- **Secondary source**: - These include desk review of both published and unpublished material including policy documents, newspapers, internet, journals, articles, reports, bulletins, newsletters, and site safety text books available in KNUST main library. The secondary source

was to get a deeper understanding of occupational health and safety related issues involving casual workers in the construction industry

The information gathered from the preliminary phase helped guide the second phase of the fieldwork, which is distribution of questionnaires and collection of data from the key respondents

4.3.2 Second Phase

The second phase of the study includes:

- design of research instrument; and
- data collection

4.3.2.1 Design of Research Instrument

In order to achieve the aim and objectives of the study, well structured close-ended questionnaires were designed to gather information from building construction sites in Kumasi Metropolis. These questions were ethical and feasible. The wordings were without bias and the questions provided multiple choice options which gave the respondents the opportunity to present their ideas by way of selecting from the options provided.

Close-ended questionnaires were used because Glasow (2005) has indicated, close-ended questions are easy for respondents to answer and it also help researchers to analyze their data easily. Salant et al (1994) are also of the view that closed-ended questions with unordered choices, for example the multiple choice questions are useful for ranking items in order of preference. Further, Fowler et al (1995) suggested that close-ended questionnaires are used to gauge the respondents' ability to provide informed responses or to identify respondents who believe they are informed and compare their responses to those who do not believe they are informed.

McIntyre (1999), Fowler et al (1995) and Salant et al (1994) further asserted that researchers must avoid questions that ask the respondent for data they could not or do not have, including questions that assume the respondent knows something about the subject and more so personal questions. Objectionable statements that reflect the researcher's bias and questions that require difficult calculations should similarly be avoided in the case of wording of questionnaires. They observed that questions with predisposition type, either for or against a particular perspective should be avoided, because such questions may be leading or may include assumptions that may not be true. To this end, question nine for example under the employers' questionnaire was cast as: *'Below are a number of welfare facilities and safety materials provided on sites for casual workers. On a scale of 1 to 5, I please rank these provisions to indicate the extent to which they are important for addressing the health and safety concerns of casual workers by ticking the appropriate cell'* (See appendix 3)

4.3.2.1.1 The Content and the Rational Of the Research Questionnaires

The content of the questionnaires for the two groups of respondent (contractors and the casual workers) were different with different subheadings (see appendix B). For the employers, the information sought was divided into four subheadings:

- subheading (A):- personal / company's details (e.g. position, the educational level, company's categorisation, working experience in the industry);
- subheading (B):- health and safety issues (provision of welfare facilities and protective equipment); and
- Subheading (C):- benefits and concern of engaging casual workers

Generally, the first subheading (A) in the employers' questionnaire was to identify the types of companies and the kind of personnel from whom information is being sought from and indeed this is to establish the credibility of the data. The purpose of subheading (B) was to indicate whether employers provide health and safety facilities to Ghanaian casual workers on construction sites. This question was necessary because indications from chapter two are that most of the construction firms of the countries reviewed such as China, Malaysia, India, Tanzania, South Africa do not provide welfare related facilities and safety materials to casual workers on building construction sites and given the similarities in the construction industries in these developing countries, there is little doubt that the trends observed might be different in Ghana. Hence, questions 7, 8 and 9 under the employers' questionnaires were posed to find out whether that trend is similar in Ghana. The responses to these questions will help to address the research question, "*What are the challenges facing the Ghanaian casual workers on Occupational Health and Safety*"? posed in chapter one.

Subheading C deals with benefits and concerns of engaging casual worker. This will give the idea of how important these casual workers are in the construction industry.

In the case of casual workers the information sought was on:

- subheading (A):- personal details such as their educational level, how they joined their current company);
- subheading (B):- provision of welfare facilities; and
- subheading (C):- provision of safety equipment

The casual workers responded to same questions posed to the employers but in it reverse form and this was a way of finding the accuracy of the information provided by the respondents

In most of these subheadings in the questionnaires, the respondents (the contractor and the casual workers) were to use Likert scale to scale them in other of importance to assess the

various factors identified in literature review. The conventional five-points of scaling for employers for example were selected as.

- very important (5 points)
- important (4 points)
- neutral (3 points)
- not important (2 points)
- not very important (1 point)

4.3.2.1.2 Covering Letter

In order to achieve high response rate, especially from the contractor a covering letter from the department of Building Technology accompanied the questionnaires and in the letter, the department introduced the researcher and explained the purpose of the study to the respondents. The letter again, indicated to the respondents the need for their response and assured them the confidentiality of their response. Additionally, instructions were given to respondents as how they should indicate their reaction to specific statement on occupational health and safety issues involving casual workers, and a copy of this letter is shown in the appendix 3

4.3.2.2 Data Collection

4.3.2.2.1 Sampling Frame

Sampling frame by definition is a list of the people or items from which a statistical sample is taken (Encarta Dictionaries 2007), and in this study the targeted respondents were:

- Project engineers, project managers and foremen who were on active building construction sites; and
- Casual workers on these active sites.

Project engineers and managers were targeted because, it has been established by fact that most project engineers have the widest exposure to a construction projects, and are involved in various project phases including planning, design, and construction. They are most often than not responsible for setting up safety policies and programmes on sites and work closely with the main contractor and hence, their roles in safety management are explicit.

Again, site general foremen act on behalf of the contractor to supervise workmen to work safely and are probably the closest party to the construction workers. They have to ensure a safe work site by the provision of correct equipment and machines, implementation of appropriate construction methods and procedures, and supervision of proper plant or equipment operation (Toole, 2002). Moreover, better safety results occur if foremen carry out positive safety behaviour on site including the provision of appropriate personal protective equipment and regular safety signals to workers (Langford et al., 2000).

Casual workers on the other hand are directly involved with the actual construction works and they know the problems they encounter with management in terms of site safety and safety measures or procedures considered during construction works.

4.3.2.2.2 Sample Size Determination

4.3.2.2.2.1 Building Construction Firms

Ahadzie (2007) pointed out that there are over 20,000 registered “building contractors” with Ministry of Water Resources, Works and Housing and 12% of these building contractors are in the Ashanti Region. Meaning, the region have about 2400 registered contractors. To determine the minimum sample size of these registered contractors in the Kumasi metropolis, Kish (1965) formula which gives a procedure for calculating minimum sample size has to be applied.

$$n = \frac{k}{1 + \frac{k}{N}}$$

Where: n = Sample Size, $k = \frac{s^2}{v^2}$ N = Population Size

S = Maximum standard deviation in the population element (total error = 0.1 at a confidence level of 95%)

V = Standard error of sampling distribution = 0.05

P = the population elements.

$$S^2 = P(1-P) = 0.5(1-0.5) = 0.25$$

Therefore in determining the minimum sample size of contractors in Ashanti region given that $N = 2400$

$$k = \frac{s^2}{v^2} = \frac{.25}{.05} = 100$$

$$n = \frac{k}{1 + \frac{k}{N}}$$

$$n = \frac{100}{1 + \frac{100}{2400}} = 96$$

$n = 96$ means that, the minimum sample size of building contractors in Kumasi to be used for the study is approximately 96. This 96 number of contractors will help in establishing the actual sample size for the study. Saunders et al (2007) however put forward a formula for calculating for actual sample size. This formula according to Saunders et al (2007) considers irregularities such as refusal to respond to questionnaires, ineligibility to respond to questionnaires, inability to locate respondent which occur during distribution and collection of data. The formula is presented here as:

$$n^a = \frac{n \times 100}{re\%}$$

Where n^a is the actual sample size required, n is the minimum sample size, $re\%$ is the estimated response rate expressed as a percentage.

Oladapo (2005) and other researchers such as Newman and Idrus (2002), Ellhag and Boussabaine (1999) and others, have indicated that a response rate of 30% is good enough in construction studies. Thus given that $n = 96$, $re\% = 30$. n^a will compute as:

$$n^a = \frac{96 \times 100}{30}$$

$$= 320$$

Drawing from the assertion from Oladapo (2005) and the formula from Saunders et al (2007), 320 is the actual sample size, however 100 respondents was decided because the time for the submission of this dissertation to the Department Of Building Technology of Kwame Nkrumah University of Science and Technology (KNUST) for assessment was short.

4.3.2.2.2 Method of selecting Site Engineers, Foremen and Project Manager

The technique applied for the selection of the project engineer or manager or the foreman is purposive sampling. This technique is used because Erbil et al (2010) has indicated that, the purposive sampling technique allows the researcher to select the individual who have good knowledge on the subject in discussion. As indicated in section 4.3.2.2.2.1 of this section, the project engineer or manager are responsible for setting up safety policies while foremen are closer to the casual workers and responsible for implementation of safety policies and with this it is expected that respondent will demonstrate good knowledge about OHS issues of casual workers. The procedure for the sampling according to Wilmot (2005) is that, group the respondent according to preselected criteria relevant to a particular research questions and let them respond. Here according to Wilmot (2005), the sample size of respondent at the time of application of the technique may or may not be necessary. Based on this, on each of the selected 100 construction sites, depending on who is available, either the project engineer or manager or

the foreman will be asked to respond to questionnaires. Where all the respondent are present or two are present on site, the longer served respondent is selected from the group to respond to the questionnaire. However if the contractor/owner is present, then the contractor is selected.

4.3.2.2.2.3 Casual Workers

As indicated in section 2.4 of chapter two, all the categories of building construction firms in Ghana employs a considerable number of casual workers. With this, it is appropriate to select casual workers from the each of the targeted 100 construction firms. To this reason, a casual worker from each site is targeted and this gives a sample population of 100 casual workers. The method of selection is also based on purposive sampling (see section 4.3.2.2.2.2). Here, the longer served casual worker is selected because it is expected that the longer served casual would give an in-depth knowledge of the real situation on their occupational health and safety issues.

4.3.2.2.2.4 The Distribution and Collection of Data

Data collection is a term used to describe a process of preparing and collecting data and purpose of these processes is to obtain information to keep on record, to make decisions about important issues, and to pass information on to others. The developed questionnaires were distributed to and retrieved from construction offices and active construction sites in person. This process of distribution and retrieving of the questionnaires in person was taken for two reasons as suggested by Ahadzie (2007), first, to make sure that the questionnaires gets to the intended recipients and secondly, to help improve the response rate. The top management on site (the owners/contractors or project manager or site engineer or the general foreman) were given one set questionnaire for a response and on the same site a casual worker was selected to respond to another set of questionnaire, and those of casual workers who could not read or write at the time of distribution were guided by the researcher. Those casual who claimed they could read and understand were

left with the questionnaires to be collected at a later time. In all some of the questionnaires were collected back on the same day while others were collected later from the respondent. When the rest was collected, it was realised that 14 questionnaires from the casual workers and 6 from the other respondent were not properly answered.

Out of the 100 questionnaires distributed, 75 were retrieved. Twenty (20) of the returns were found to be too badly completed to be useful for the analysis and were therefore discarded. This brought the responses effectively to 55, representing a response rate of 55%. This response rate is considered adequate as, according to Oladapo (2005), Newman & Idrus (2002) and Ellhag and Boussabaine (1999), a response rate of 30% is good enough in construction studies

4.4 SUMMARY

This chapter has established a theoretical framework of occupational health and safety for casual workers. Through the framework set, questionnaires have been developed by employing number of research methods. Again, the chapter has presented the distribution and retrieving of questionnaires. The next stage is to analyse and discuss the results obtained.

CHAPTER FIVE

ANALYSIS AND DISCUSSION OF RESULTS

5.0 INTRODUCTION

This chapter deals with the analysis and discussion of collected data using Statistical Package for Social Sciences (SPSS) and the statistical tools employed for the analysis were *Chi-Square χ^2 test and one sample statistics means of importance*. Independence index was also used for the analyses. The *Chi-Square χ^2 test* was used to infer whether differences exist in response from the respondents, while the *one sample statistics means of importance* helped in establishing the significant importance of the welfare and safety issues. The chapter also present the results of the analysis and discussions in the form, texts, figures, tables and the like. However, the analysis of the demography of the respondent using descriptive statistics set the chapter's agenda.

5.1 THE DEMOGRAPHY

5.1.1 The Demography of Personnel

For the purpose of this analysis, the personnel used here are defined to include owners or managers of company, project managers, project engineers and site general foremen. Under the general information of the employers' questionnaires, the information sought were on company's

categorisation, the personnel's details including their position in the company, educational level and the working experience in the construction industry. Tables 5.1 and 5.2 give a picture of the personnel's profile while table 5.3 shows the various types of construction firms that were involved in the study.

From Table 5.1, about 88% of the personnel on site were in the senior management positions (comprising 44% of project engineers and 44% of site general foremen) and about 77% of these personnel have had further or higher education from HND to BSc in construction related courses.

Table 5.1: Educational Background of Personnel

Personnel	Educational Level				No. of response	Response rate in %
	MSc	BSc	HND	Technician		
Owners	-	3	1	1	5	9
Project Managers	1	1	-	-	2	3
Project Engineers	2	14	7	1	24	44
Site general foremen	-	-	16	8	24	44
Total	3(5%)	18(33%)	24(44%)	10(18%)	55	100

Table 5.2: Working Experiencing of Personnel

Type of Respondents	Years Worked					Number of Response	Response rate in %
	Over 20	16-20	11-15	6-10	Up to 5		
owners	-	3	1	-	1	5	9
Project Manager	-	-	2	-	-	2	4
Project Engineers	2	-	9	9	2	22	40
Site foreman	2	5	2	12	4	25	46

Total	4(13%)	8(15%)	14(26%)	21(38%)	7(13%)	55	100
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Table 5.2 shows the working experience of the personnel and the indications are that, about 38% of these personnel have worked between 6 to 10 years and majority of about 46% of the respondent are site general foremen. This background information gathered on these personnel suggests that they are competent, experienced and capable of exercising good judgment and as such the responses provided by them could be relied upon for study.

With regards to participation of construction firms (see Table 5.3), about 47% of the construction firms belongs to D3K3 classification of Ministry of Water Resources, Works and Housing. In comparing the result from Table 5.3, D3K3 firms are more than D2K2 and D1K1 in the Kumasi metropolis. Understanding from Fugar (2009) (see chapter two sections 2.1) is that, almost all the D3K3 construction firms do not have Human Resource Management (HRM) departments together with its associated health and safety personnel to deal with safety issues. This has led the owners /managers and operational managers to perform health and safety personnel's functions. The likely hood implications are that, the occupational health and safety of casual workers would be affected.

Table 5.3: Construction Firms and Personnel

Company Type & number		Personnel			
		Owners	Project Manager	Project Engineers	Site foreman
D1, K1	8(15)	-	1	4	3
D2, K2	21(38)	3	1	14	3
D3, K3	26(47)	2	-	6	18
Total	55(100)	5(9)	2(3)	24(44)	24(44)

5.1.2 The Demography of Casual Worker

In the case of casual workers, the background information obtained is presented here in Tables 5.4 and 5.5. From Table 5.4, about 60% of the casual workers are between the ages of 30 to 39 years while 28% of the casual workers have their ages between 18 to 29 years. About 4% of the casual workers are below 18 years of age and 9% are in the age group of 40 to 49 years. From Table 5.5 about 29% of these casual workers have had basic training in Technical or Vocational skills, while 28% of them are BECE (Basic Education Certificate Examination) graduates. About 24% of the casual workers are MSLC (Middle School Leaving Certificate) graduate while 9% of them have secondary or higher school education. The remaining 11% have no formal education.

The results from Tables 5.4 and 5.5 Table, paints a picture that most casual workers on sites falls within the working age in Ghana which is 18 to 60 years. This also means that casual workers within this study are matured enough to address their health and safety issues. Again, for the fact that about 92% (29%+28%+24%+11) casual workers have their educational level up to Basic Education, means that their educational level is low. The implications are that it will be very difficult for them to read and understand the legislation and policies governing their employment and occupational health safety on site. Thus in terms of safety materials, they may not be able demand the kind of safety materials they require for their work if the employers refuse to provide.

Table 5.4: Age Distribution of Casual Workers on Construction Site

Ages	Frequency	Percent	Valid Percent	Cumulative Percent
less than 18	2	3.6	3.6	3.6
18- 29	15	27.3	27.3	30.9
30- 39	33	60.0	60.0	90.9
40-49	5	9.1	9.1	100.0
Total	55	100.0	100.0	

Table 5.5: Educational Level of Casual Workers on Construction Site

Educational Level	Frequency	Percent	Valid Percent	Cumulative Percent
Never been to School	6	10.9	10.9	10.9
MSLC	13	23.6	23.6	34.5
BECE	15	27.3	27.3	61.8
VOC/ TECH	16	29.1	29.1	90.9
Secondary or higher	5	9.1	9.1	100.0
Total	55	100.0	100.0	

5.2 REACTIONS TO OHS ISSUES ON CONSTRUCTION SITE

As demonstrated in the literature review (see chapter two and three), the occupational health and safety of casual workers on some construction sites in most developing countries have been compromised as a result of the drive for economic and social behaviour of both employers and casual workers. The assertion made on these developing countries was that some employers do not provide some welfare facilities and safety materials to casual workers on construction sites. The emphasis on this section is to determine whether or not, the employers in Kumasi Metropolis provide welfare facilities and safety materials to casual workers on construction sites. To this end, section 5.2.1 deals with provisions of welfare facilities while section 5.2.2 also deals with provisions of safety materials.

5.2.1 Welfare Facilities

Question: *There is general assertion that contractors do not provide the following welfare related facilities on construction site for casual workers. Please indicate your reaction to each statement by ticking the appropriate cell.*

The above question is related to some practices of some contractors on construction sites in the context of non provision of some welfare facilities to casual workers (see chapter 2, section 2.8.1) and for this reason Ghanaian contractors especially those in Kumasi were to respond to this assertion by ticking an appropriate cell to indicate whether they agree or disagree to that assertion.

Results: Table 5.7 shows the average rating to the responses from contractors to the above question.

Table 5.6: Employer's responses to none provision of welfare facilities

Welfare Facilities	Strongly Agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly Disagree (%)
Safe drinking water	36.4	20.0	7.3	12.7	23.6
Means of heating food	47.3	20.0	20.0	3.6	9.1
Water for washing and cooking	38.2	25.5	21.8	7.3	7.3
Suitable accommodation to rest	36.4	16.4	29.1	9.1	9.1
Catering service	45.5	10.9	12.7	16.4	14.5
Sanitary facilities (toilets, showers, changing rooms)	40.0	16.4	10.9	20.0	12.7
Accommodation to change and store clothing	41.8	16.4	10.9	20.0	10.9
First-aid equipment	50.9	18.2	7.3	12.7	10.9
Average ratings	42	18	15	13	12

Comment:

From analysis of the results shown in table 5.6 the following picture emerge:

- Going back to Table 5.6, among other issues, employers admitted four welfare facilities that were lacking on site for casual workers. This includes first-aid equipment, means of heating food, catering service and accommodation to change and store clothing.
- With the average response rate of 51%, employers demonstrate that first-aid items as a welfare item that is lacking on construction site for casual workers.

- Means of heating food, catering service and accommodation to change and store clothing also took in turns with average ratings of about 47%, 46% and 42% respectively

- Taking an average of the ratings over all eight “key welfare related issues” of casual workers on construction sites, employers rated the displeasure of that assertion as 25% (12% + 13%) while 60% (42% + 18%) agreed to that assertion.

The same question was posed to casual workers but the Likert scale of 1-5 points which ranges from strongly agree to strongly disagree was stated in opposite direction of 5-1 for casual workers to respond to that assertion and the results obtained is presented in Table 5.7

- From table 5.7, four issues of welfare facilities were identified by casual workers to be lacking on site for them. This includes suitable accommodation to rest, catering service, first-aid equipment and means of heating food.

- About 42% of casual workers indicated that suitable accommodation to rest on site is a facility that is lacking on site for them.

- Catering service, first-aid equipment and means of heating food had their ratings as 38 %, 33% and 29% respectively.

- With an average total of about 51% (28% + 23%), casual workers disagreed to the assertion that employers provide welfare related facilities for them while an average rating of 26% (10% +16%) , casual workers agreed to that assertion.

Table 5.7: Casual Workers Reaction to the Provisions Welfare Facilities

Welfare Facilities	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
	(%)	(%)	(%)	(%)	(%)
Safe drinking water	14.5	36.4	7.3	16.4	25.5
Means of heating food	5.6	13	16.7	37	27.8

Welfare Facilities	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
	(%)	(%)	(%)	(%)	(%)
Water for washing and cooking	10.9	9.1	40.0	25.5	14.5
Suitable accommodation to rest	11.3	3.8	37.7	41.5	5.7
Catering service	5.5	10.9	12.7	38.2	30.9
Sanitary facilities (toilets, showers, changing rooms)	10.9	14.5	30.9	23.6	20.0
Accommodation to change and store clothing	10.9	10.9	21.8	27.3	29.1
First-aid equipment	10.9	29.1	14.5	12.7	32.7
Average ratings	10	16	23	28	23

The result also from tables 5.6 and 5.7 indicates high responses from both employers (60%) and casual workers (51%). This seems to suggest that the provisions of welfare facilities on construction site in Kumasi Metropolis have been compromised. To confirm this, the chi-squared test of the contingency table was employed to infer whether differences exist in response between employers and casual workers. The next section introduces the contingency table of chi-squared test on welfare facilities.

5.2.1.1 Chi-Squared (χ^2) Test on Welfare Facilities

The Chi-Squared test of the contingency table is used to determine whether differences exist in response between two or more populations (Keller et al, 2004). In this study, Chi-Squared test was used because; employers and casual workers have been identified as the population and because of the use of descriptive statistics (see tables 5.6 and 5.7 of this chapter). The result of Chi-Squared test is achieved by stating the hypothesis, computing the observed and expected values from the responses, computing χ^2 statistic and p-value. The χ^2 statistic measures how far away is the observed values from the expected one and it is the sum of each of the

contributions from each variable. The p-value is computed by looking under the Chi-square table with the degrees of freedom (see appendix 5)

From this, table 5.8 shows the results of computed observed values and expected values on welfare facilities from both employers and casual workers.

Table: 5.8: Observed and Expected proportion on Welfare Issues

Welfare facilities	Casual workers	Employers	Chi-Squared value (χ^2_{cal})
Safe drinking water	41.90 (45.36) *	56.40 (52.94) *	10.898
Means of heating food	63.70 (57.22) *	60.30 (66.78) *	
Water for washing and cooking	40.00 (47.86) *	63.70 (55.84) *	
Suitable accommodation to rest	45.50 (45.36) *	52.80 (52.94) *	
Catering service	69.10 (57.92) *	56.40 (67.58) *	
Sanitary facilities (toilets, showers, changing rooms)	43.60 (46.15) *	56.40 (53.85) *	
Accommodation to change and store clothing	56.40 (52.89) *	58.20 (61.71) *	
First-aid equipment	45.40 (52.89) *	69.10 (61.66) *	

Note: * are expected values

As indicated, the result of Chi-Squared test is achieved by:

- stating the hypothesis;
- computing the observed and expected values from the responses;
- computing χ^2 statistic; and
- p-value

Hypothesis

H₀: response from casual workers and employers on welfare facilities issues are independent.

H₁: H₀ is not true (two-tail)

Where H_0 denotes the null hypothesis and H_1 denotes the alternative hypothesis

Significant level (α) = 0.05

We reject H_0 if $\chi^2_{cal} > \chi^2_{0.05, 7}$.

χ^2 Statistic

After stating the hypothesis, the next step is to calculate the χ^2 statistic and it is computed from the relation:

$$(\chi^2) = \frac{\sum_{i=1}^n ([Observed\ proportions - Expected\ proportions])^2}{Expected\ proportions}$$

The observed and expected proportions values are generated from the SPSS as a result of entering data. However, χ^2 for all variables from welfare facilities table (table 5.8) is calculated from the χ^2 equation above. For example, the χ^2 for safe drinking water is calculated as follows:

$$\begin{aligned} \chi^2_{\text{Safe drinking water}} &= \frac{(observed\ proportion - expected\ proportion)^2}{(expected\ proportion)} \\ &= \frac{(41.90 - 45.36)^2}{45.36} = 0.26 \text{ for casual worker} \\ &= \frac{(63.70 - 57.22)^2}{57.22} = 0.73 \text{ for casual worker} \\ &= \frac{(56.40 - 52.94)^2}{52.94} = 0.22 \text{ for employers} \\ &= \frac{(60.30 - 66.78)^2}{66.78} = 0.18 \text{ for employers} \end{aligned}$$

$$\sum X^2 \text{ for safe drinking water} = 0.26 + 0.73 + 0.22 + 0.18 = 1.39$$

. Thus the X^2 -statistic

which is the sum of each variable in the welfare facilities table 5.8 is then calculated.

From table 5.8 Chi-Squared value calculated (X^2_{cal}) = **10.898**

Degrees Of Freedom

The degrees of freedom is calculated from (rows-1) \times (cols-1) and from table 5.8 for example, the number of rows is 8, and the number of columns is 2. Thus the degrees of freedom is = (8-1) \times (2-1) = 7 \times 1 = 7.

P-Value

The last part is to compute the *P-value*. This is done by looking under the Chi-square table (see appendix 5). The degrees of freedom which is now 7 is read from the Chi-square table under significant level (α) = 0.05. this then give $X^2_{Table} = \mathbf{14.067}$

$X^2_{Table} = 14.067$ (degrees of freedom = 7)

Since $X^2_{cal} < X^2_{Table}$, we accept the null hypothesis (H_0) and reject the alternative hypothesis (H_1). This means that there is no evidence of a relationship between responses from casual workers and employers on welfare issues. Thus the responses from casual workers indicating that contractors do not provided welfare facilities to them are independent from the responses from the employers

The *P-value* for the test statistic is $P\text{-value} > 0.100$. With the $P\text{-value} > 0.100 > \alpha = 0.05$, there is enough evidence to infer that the responses from casual workers and employers on issues about the provision of welfare facilities on construction sites are unrelated. There are significant differences in opinions (responses) as far as $P\text{-value} > 0.100$ is concerned. This underscores the reason why there is a high frequency of “strongly agree” to “strongly disagree”

in table 5.6 and “strongly disagree” to “strongly agree” in table 5.7. The meaning and conclusion of $P\text{-value} > 0.100$ is that contractors in Kumasi Metropolis do provide welfare facilities at construction sites for casual workers.

The chi-square test has established that contractors in Kumasi Metropolis do not provide welfare facilities at construction sites for casual workers. However, from table 5.6, 60% of the employers in Kumasi Metropolis have admitted to the fact that they do not provide welfare facilities on construction sites for casual workers. This appears to create difference in results from the employers and chi-square test, but this should not minimize the importance of the findings from the employers because, Sinn (2006), explained that these differences sometimes occurs and it is due a sample error.

The facts still remains and as shown in tables 5.6 and 5.7, welfare facilities are lacking to casual workers on Kumasi construction sites. For example there is no arrangement for catering services for casual workers. Food is sold by women vendors who come around and no proper places for dining and casual workers. Casual workers have their meals in outdoors, exposing their meals to dust in the air. The environment within which they eat is unhygienic. Portable drinking water is not provided to casual workers in some construction sites. Casual workers have to carry their drinking water from home otherwise they have to request or buy from these women vendors. The water that is provided on construction sites are stored in unhygienic concrete or ploy tanks infested by spirogyra and other organisms and unfit for human consumption. Sanitary services such as toilets, urinals are virtually not available at some construction sites and those provided, are not hygienic. On construction sites where toilets facilities are in nonexistent, casual workers have to depend on nearby bushes.

There is all indication that contractors do not provide welfare facilities on construction sites for casual workers in Kumasi Metropolis and the results appears to confirms what was reviewed from the literature (see chapter 2, section 2.6) where Vaid, (1999) reported that in

India, the on-site accommodation provided for casual workers is rudimentary, comprising simple shacks with no running water or decent sanitation, and poor ventilation. Abdul-Aziz, (2001) also reported that in Malaysia, casual workers live on sites in buildings of poor quality. Even China as an emerging developed nation, the trend was not different. The bulk of casual workers on construction sites, lack proper places to have their meals and they are often found eating outdoors, exposed to dust in the air, without dining tables or seats (Lu and Fox, 2001). A base study conducted in Tanzania by ILO, (2005) revealed that casual workers were not provided with welfare facilities such as toilets in most of the projects.

5.2.2 Safety Issues

Question: *There is a general assertion that contractors **do not provide** the following safety related **items or equipment** on construction site for casual workers.*

The above question is related to some practises of some contractors on construction sites in the context of none provision of some safety equipment to casual workers and because of this, some employers were asked to indicate whether they agree or disagree to that assertion. Table 5.9 below shows the average rate of responses from employers to the above question.

Table 5.9: Employer's Responses on Provision of Safety Materials

Safety Materials	Strongly Agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly Disagree (%)
Safety signs	50.9	30.9	7.3	0	10.9
Hard hats or helmet	47.3	10.9	16.4	9.1	16.4
Safety glasses, goggles, and face shields	36.4	18.2	20.0	9.1	5.5
Safety boots	34.5	25.5	21.8	9.1	9.1
Rain gear	38.2	29.1	16.4	3.6	3.6
Hearing protection	32.7	30.9	21.8	7.3	3.6
Knee pads	34.5	25.5	20.0	5.5	5.5
Gloves	32.7	20.0	30.9	9.1	7.3
Safety nets	32.7	25.5	18.2	10.9	9.1
Flashlights	30.9	25.5	25.5	12.7	5.5
Ladder Scaffold platforms	29.1	20.0	21.8	16.4	12.7

hoisting equipment	32.7	21.8	20.0	12.7	12.7
Average ratings	36	24	20	9	9

Comment:

Following the results in table 5.9 the following issues appears to emerge:

- From table 5.9, a total of about 60% (36% + 24%) of contractors agreed to the statement that they do not provide safety materials on construction site to casual workers while an average of about 18% (9% +9%) of the contractors disagreed to the assertion.
- Among other factors, indications from table 5.8 suggests that safety signs, hard hats or helmet, rain gear and safety glasses (goggles and face shields) were the four main safety materials lacking on sites to casual workers.
- An average response rate of about 51%, employers expressed that casual workers lacks safety signs on construction sites.
- Hard hats or helmet, rain gear and safety glasses (goggles and face shields) had average ratings of 47.3%, 38.2%, and 36.4% respectively.

The same question was posed to casual workers but the Likert scale of 1-5 points was in the opposite direction of 5-1. The result obtained is presented in table 5.10.

Table 5.10: Casual Workers Responses on Provision of Safety Material

Safety Materials	Strongly Agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly Disagree (%)
Safety signs	7.3	27.3	10.9	12.7	41.8
Hard hats or helmet	18.2	25.5	20.0	3.6	32.7
Safety glasses, goggles, and face shields	13.0	31.5	16.7	24.1	14.8
Safety boots	9.1	16.4	30.9	12.7	30.9
Rain gear	9.1	1.8	21.8	41.8	25.5
Hearing protection	10.9	3.6	43.6	16.4	25.5
Knee pads	9.4	5.7	22.6	35.8	26.4
Gloves	14.8	7.4	37.0	22.2	18.5

Safety Materials	Strongly Agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly Disagree (%)
Safety nets	7.3	1.8	10.9	41.8	38.2
Flashlights	7.5	1.9	17.0	28.3	45.3
Ladder Scaffold platforms hoisting equipment	12.7	1.8	30.9	36.4	18.2
Average ratings	11	11	24	26	29

Comments:

- From table 5.10, the average ratings indicate that, about 55% (29% + 26%) of casual workers disagreed to the assertion while 22% of the casual workers (11% + 11%) agreed to that assertion.
- From table 5.10 flashlights, safety net, rain gear and knee pad were the four main safety issues on sites lacking to casual workers.
- With an average response of about 46%, casual workers expressed that flashlight is safety material that is lacking.
- Hard hats or helmet, rain gear and safety glasses (goggles and face shields) had average ratings of about 47%, 38%, and 36% respectively.

5.2.2.1 Chi-Squared (χ^2) Test on Safety Materials

Referring from section 5.2.1.1, table 5.11 below shows the calculated observed and expected values of the responses from casual workers and employers in relation to the provisions of safety material on construction site.

Table 5.11: Observed and Expected proportion on Safety Materials

Safety Materials	Casual workers	Employers	Chi-Squared value (χ^2_{cal})
Safety signs	54.50	81.90	24.513

Safety Materials	Casual workers	Employers	Chi-Squared value (X^2_{cal})
	(64.76) *	(71.69) *	
Hard hats or helmets	36.30	58.20	
	(44.87) *	(49.67) *	
Safety glasses, goggles and face shields	38.10	54.60	
	(44.01) *	(48.72) *	
Safety boots	43.60	60.00	
	(48.95) *	(54.19) *	
Rain gear	67.30	67.30	
	(63.90) *	(70.75) *	
Hearing protection	41.90	63.60	
	(50.09) *	(55.45) *	
Knee pads	60.00	60.00	
	(56.97) *	(63.07) *	
Gloves	40.00	52.70	
	(44.01) *	(48.72) *	
Safety nets	80.00	58.20	
	(65.61) *	(72.64) *	
Flashlights	70.90	56.40	
	(60.43) *	(66.91) *	
Ladder Scaffold platforms	54.60	49.10	
	(49.23) *	(54.50) *	
Hoisting equipment	60.00	54.50	
	(54.36) *	(60.18) *	

Note: * are expected values

Hypothesis:

H_0 : proportions in each response category for both casual workers and employers on issues relating to safety materials are independent.

H_1 : H_0 is not true (two-tail)

A significant level of $\alpha = 0.05$ was used.

We reject H_0 if $X^2_{cal} > X^2_{0.05, 11}$

$$X^2_{cal} = \sum_{i=1}^n \frac{(\text{Observed proportions} - \text{Expected proportions})^2}{\text{Expected proportions}}$$

From the frequency tables of both observed and expected proportions 5.12

Chi-Squared value calculated (X^2_{cal}) = 24.513

$$X^2_{0.05, 11} = 19.675 \text{ (degrees of freedom = 11)}$$

Since $X^2_{cal} > X^2_{Table}$, we reject the null hypothesis (H_0) and accept the alternative hypothesis (H_1) concluding that there is enough evidence of a relationship between responses from casual workers and employers on issues relating to safety materials

The P -value for the test statistic is

$$P(X^2_{cal} < 0.015)$$

With the P -value $< 0.015 < \alpha = 0.05$, there is enough evidence to infer that the responses from casual workers and employers on issues about the provision of safety materials on construction sites are related. That is there are differences in opinion (responses) among casual workers and employers on issues about the provision of safety materials on construction sites. The relationship or the extent of agreement is highly significant as far as P -value < 0.015 is concerned. This underscores the reasons why there were high frequencies of “strongly agree” to “strongly disagree” responses in table 5.9 and “strongly disagree” to “strongly agree” in table 5.10. This means that there is enough evidence to believe that contractors do not provide safety related materials on construction sites for casual workers.

Typically, in almost all project sites in Kumasi Metropolis, contractors do not provide safety gear, boots, safety uniforms, helmets, gloves, nose masks to casual workers. Indeed these safety materials were lacking on sites, and apart from the results provided above, the evident of this presented as pictures in appendix D of this study. The result also confirms, the finding of Mitullah et al (2003) in Tanzania construction sites, where it was revealed that about 70% of casual workers were not provided with safety materials such as hard hats or helmet, safety glasses, goggles, and face shields, safety boots at most of the project sites.

5.3 ONE SAMPLE STATISTIC MEANS OF IMPORTANCE

Now that certain welfare facilities and safety materials have been confirmed as a challenge to casual workers on construction site, one sample statistic means of importance is carried out to determine whether the respondents considers some of these facilities to be important or otherwise. While, the mean ranking establishes the importance of some of these issues, it also provided a clearer picture of the concerns raised by employers and casual workers (Ahadzie, 2007).

The ranking of these variables (welfare facilities and safety issues), are determined by putting together the sample size, the sample mean, the standard deviations and the standard error of each of these variables of the welfare facilities and safety materials. These statistical tools are used because Saunders et al, (2007) has indicated that the sample mean is an average computed by summing the values of several observations and dividing by the number of observation. This sample mean, according to Saunders et al (2007), plays an important role during sampling by making inferences about the population based on sample information.

Standard deviation according to Ahadzie (2007), is the statistical tool that measures the dispersion around the sample mean. Further, Ahadzie (2007) indicated, these values of standard deviation of the sample mean is a measure of how representative a sample is likely to be to the population. A large standard deviation (relative to the sample mean) suggests that the values of standard deviation are widely spread out from the sample mean. This means that that there is a lot of variability between means of the sample. Small standard deviations on the other hand, suggest that the values of standard deviation are more tightly clustered around the sample mean. This is an indication that most sample means are similar to the population mean and so the sample is likely to be an accurate reflection of the population (Ahadzie, 2007).

The standard error indicates how tightly the sample mean are distributed around the population mean (Babbie, 2001). From this, the standard error appears to behave like standard

deviation. To this, a number of researchers such as Babbie (2001), Ahadzie (2007) often referred the standard error as the standard deviation.

These characteristics of the statistical tools, helped in the ranking of the variables. It is important to note that while ranking the variables of welfare facilities and safety materials using one sample statistic means of importance, when two or more variables have the same mean, the one with the lowest standard deviation was assigned the highest importance ranking. To this end, tables 5.12 and 5.13 below shows the summary of results of ranking of welfare facilities and safety materials using one sample statistic means of importance on building construction sites.

Table 5.12: Summary of one sample statistic showing rankings of OHS issues from employers'

	N	Mean	Standard deviation	Standard error	Ranking
Welfare facilities					
First-aid equipment	49	4.7200	.57286	0.081	1 st
Safe drinking water	49	4.7000	.88641	0.094	2 nd
Sanitary facilities (toilets, showers, changing rooms)	49	4.1800	.80026	0.102	3 rd
Accommodation to change and store clothing	49	3.9600	.69869	0.140	4 th
Means of heating food	49	3.1200	1.43769	0.119	5 th
Suitable accommodation to rest	49	3.6800	1.03884	0.125	6 th
Catering service	49	3.4200	1.03194	0.132	7 th
Water for washing and cooking	49	3.0800	1.36785	0.127	8 th
Safety Materials					
Hard hats or helmet	49	4.4200	.78480	0.095	1 st
Training in safety	49	4.4200	.90554	0.091	2 nd
Appointment of safety officer on site	49	4.4000	1.03016	0.090	3 rd

Safety glasses, goggles, and face shields	49	4.3600	.85141	0.105	4 th
Safety boots	49	4.3200	.95704	0.101	5 th
Safety signs	49	4.2400	.84660	0.103	6 th
Rain gear	49	3.5800	1.21370	0.144	7 th
Hearing protection	49	3.4000	1.17803	0.142	8 th
Hoisting equipment	49	3.4000	1.27775	0.143	9 th
Knee pads	49	3.3200	1.21957	0.126	10 th
Gloves	49	3.3000	1.34392	0.123	11 th
Ladder Scaffold platforms	49	3.2600	1.25860	0.111	12 th
Flashlights	49	3.2600	1.30634	0.105	13 th
Safety nets	49	3.1800	1.33539	0.102	14 th

Table 5.13: Summary of one sample statistic showing rankings to OHS issues from casual workers

	N	Mean	Standard deviation	Standard error	Ranking
Welfare facilities					
Safe drinking water	50	4.5686	1.00509	0.082	1 st
Suitable accommodation to rest	50	4.1373	1.00039	0.127	2 nd
Sanitary facilities (toilets, showers, changing rooms)	50	4.1373	1.13172	0.125	3 rd
First-aid equipment	50	4.1373	1.42856	0.122	4 th
Water for washing and cooking	50	4.0196	1.06752	0.138	5 th
Catering service	50	3.8824	1.32132	0.136	6 th
Means of heating food	50	3.6667	1.21106	0.118	7 th
Accommodation to change and store clothing	50	3.5686	1.17055	0.144	8 th
Safety Materials					
Safety boots	50	4.3725	1.01903	0.135	1 st
Safety signs	50	4.1176	1.05161	0.106	2 nd
Hard hats or helmet	50	4.0196	1.06752	0.130	3 rd
Training in safety	50	4.0196	1.20814	0.128	4 th

Safety glasses, goggles, and face shields	50	3.9412	1.12092	0.140	5 th
Appointment of safety officer on site	50	3.9412	1.34777	0.143	6 th
Rain gear	50	3.6078	1.32783	0.199	7 th
Knee pads	50	3.1176	4.62881	0.095	8 th
Gloves	50	3.0000	1.56205	0.100	9 th
Hearing protection	50	2.8627	1.53648	0.177	10 th
Safety nets	50	2.3333	1.46515	0.222	11 th
Flashlights	50	2.2745	1.47076	0.268	12 th
Ladder Scaffold platforms	50	2.2353	1.39411	0.292	13 th
Hoisting equipment	50	2.0000	1.41421	0.291	14 th

Comment:

The following observations were made from tables 5.12 and 5.13:

The standard deviations less than 1.0, normally indicate that there is little variability in the data or there is consistency in agreement among the respondent in their responses Ahadzie (2007). To this end, welfare facilities such as first-aid equipment, safe drinking water, sanitary facilities, accommodation to change and store clothing, hard hats or helmet and training of casuals in safety norms had their standard deviations less than 1.0. This means that there was consistency in agreement among the respondent that those variable are needed for addressing the occupational health issues confronting casual workers on construction sites.

On the welfare related issues, employers ranked first-aid equipment first (1st) as the most important facility for addressing the health and safety issues concerning casual workers. The second (2nd) and third (3rd) important facility were safe drinking water and sanitary facilities. On the other hand, casual workers ranked safe drinking water first (1st) as the most important facility for addressing the health and safety issues concerning them, while sanitary facilities and suitable accommodation to rest were ranked as second (2nd) and third (3rd) important facilities.

On the issue of safety, employers ranked hard hats or helmet first (1st) as the most important facility for addressing the health and safety issues concerning casual workers. The second 2nd and third (3rd) important issues were training of casuals in safety norms and appointment of safety officer on site. Casual workers on the other hand also ranked Safety boots first (1st) as the most important safety material for addressing the health and safety issues concerning them, while safety signs and hard hats or helmet were ranked as second (2nd) and third (3rd) important safety materials.

For the fact that sanitary facilities and first-aid equipment emerged within the first three rankings of the employers and casual workers on welfare issues, is an indication of their importance in addressing the occupational health and safety issues of casual workers on construction site. In a typical Ghanaian construction site in Kumasi, sanitary facilities such as toilets and urinals are in nonexistent and thereby casual workers have to depend on nearby bushes. With the first aid boxes, it was observed that some sites have the first boxes alright but does not contain drugs.

On safety provisions, hard hats or helmet emerged within the first three rankings of the employers and casual workers. This is also an indication that hard hats or helmet is important safety material in addressing the occupational health and safety issues of casual workers on Ghanaian construction site. Again, for employers, the training of casual workers in safety norms and appointment of safety officer on sites is a kind of proactive measures for preventing accident on site. Acting proactively requires one to anticipate problems before they occur and take steps to make sure accidents don't happen. Therefore the employers were demonstrating the proactive kind of preventing accident on site. To react proactively, casual workers think that wearing of safety boots and helmet couple with safety signs is the best option and this is to the fact that they are directly involved in the actual construction work.

5.4 RESPONSES ON BENEFITS AND CONCERN OF EMPLOYING CASUAL WORKERS

Fowler et al (1995), defines ranking as a comparisons among given options, within pairs of options, by cardinality of importance (first, second, third), or that score items one at a time using a common scale, and it's also determines the importance of that factor. In this section Importance Indices were used to rank the variables. The Importance Index (I.I) of determination of significance of factors was adopted because, Adnan et al (2007) asserted that to analyse data on ordinal scale (e.g. Likert scale 1-5), the application of Importance Index is also suitable. The Importance Index is computed as in (Adnan et al 2007):

$$\text{Importance Index} = \frac{5n_5 + 4n_4 + 3n_3 + 2n_2 + n_1}{5(n_1 + n_2 + n_3 + n_4 + n_5)} \times 100$$

Where:

n1 – number of respondents who answered “not very important”;

n2 – number of respondents who answered “not important”;

n3– number of respondents who answered “neutral ”;

n4 – number of respondents who answered “important”;

n5 – number of respondents who answered “very important”

It is worthwhile to note that the nearer the value of importance index of the identified factor is unity (1) or 100%, the more significant it is and hence, a greater impact on the rest of the variables.

Question: *Please on a scale of Very important to Not very important, indicate the extent to which the following statements influence your decision to employ casual workers*

This question is related to some benefits derived by engaging casual workers on construction site. Here, contractors were given some factors on a scale of very important to not

very important to rank to determine how these factors influences their decisions of engaging the services of casual workers. Tables 5.12 shows the average ratings of contractors' response and table 5.13 also shows the Importance Index of the ranking.

Table 5.14: Employers' Reactions to the benefits of Engaging Casual Worker

Benefits Factors	Very Important	Important	Neutral	Not Important	Not Very Important
Casual workers are readily available	69.1	25.5	-	3.6	1.8
Casual workers are cheaper to employ	49.1	29.1	9.1	9.1	3.6
Casual workers are in the weaker position to refuse to work in unsafe conditions	49.1	30.9	9.1	7.3	3.6
Casual workers are means by which employers are able to make savings on labour	40.7	38.9	14.8	1.9	3.7
Casual workers provides an easy way for adjusting labour	29.1	50.9	10.9	7.3	1.8
Casual workers are alternative to permanent worker;	25.9	50.0	11.1	7.4	5.6
Casual workers are lower wages earners	25.9	50.0	11.1	7.4	5.6
Casual workers are means of employing specific skills and knowledge	30.9	41.8	12.7	10.9	3.6
Average Rating	40	39	10	7	4

Table 5.15: Results of Importance Indices showing the ranking of benefit factors

Factors	WEIGHTING OF FACTORS										$\sum(n_i)$	I. INDEX	RANK
	1	n	2	n	3	n	4	n	5	n			
F1	1	1	2	4	0	0	14	56	38	190	251	91.27273	1 ST
F2	2	2	5	10	5	15	16	64	27	135	226	82.18182	5 th
F3	2	2	4	8	5	15	17	68	27	135	228	82.90909	3 rd
F4	2	2	1	2	8	24	21	84	22	110	222	82.22222	4 th
F5	1	1	4	8	6	18	28	112	16	80	219	79.63636	6 th
F6	3	3	4	8	6	18	27	108	14	70	207	76.66667	8 th
F7	1	1	4	8	6	18	15	60	29	145	232	84.36364	2 nd
F8	2	2	6	12	7	21	23	92	17	85	212	77.09091	7 th

Where

- F1 = Casual workers are readily available
- F2 = Casual workers are cheaper to employ
- F3 = Casual workers are in a weaker position to refuse to work in unsafe conditions
- F4 = Casual workers are a means by which employers are able to make savings on labour
- F5 = Casual workers provide an easy way for adjusting labour
- F6 = Casual workers are alternative to permanent workers
- F7 = Casual workers are lower wage earners
- F8 = Casual workers are a means of employing specific skills and knowledge

Comments

- Judging from table 5.14, about 79% (40% + 39%) of the contractors indicated that engaging casual workers are beneficially to them. Whereas 10% remained neutral, only 11% (7%+4%) of the contractors think that the engagement of casual workers is not important.
- From table 5.14, it appears that, the readily availability of casual workers, casual workers provides an easy way for adjusting labour, casual workers are lower wages earners and casual workers are alternative to permanent worker are the most beneficiaries factors to contractor in the Kumasi metropolis.

When the above factors was ranked using Importance Index, it turned out that the readily availability of casual workers is the most important factor that influences the decisions of contractors to engage their services. Another important factors were casual workers being lower wage earners and weaker in a position to refuse to work in unsafe condition.

The availability of the casuals workers to employers are due to the fact that there are always a pool of unemployed and underemployed people waiting at entrance gates of construction firms ready and willing to do skilled or unskilled work on casual basis Aladekomo (2004). This means there high turnover of casual workers wanting to be employed. This allows the employers to dictate how much they will pay and subsequently leads to employers' paying

less wage. Buchanan (2004) explained that casual workers are unwilling to leave dangerous work situations because they recognised the turnover of workers and hence, worried that they would be replaced if they complained about safety hazards on construction site. Contractors in Kumasi metropolis have clearly demonstrated this assertion by Buchanan. As casual workers gathers at entrance gates waiting to be employed, scares those who have not gain the opportunity to work. Thus, in order to maintain their position on the job means casual workers have to ignore about demands on rights.

Question: Please on a scale of Very important to Not very important, indicate the extent to which the following statements influence the displeasure of engaging casual workers in your company

This question is related to some concerns of contractors who engages casual workers on construction site and here contractors were given some factors on a scale of very important to not very important to rank to determine which of these concerns influence their displeasure in engaging the casual workers. Table 5.16 present the average ratings of the findings

Table 5.16: Employers' Reactions to the Concerns of Engaging Casual Worker

Concern Factors	VI	I	N	NI	NVI
Investing in casual workers has less of a long-term returns for their firms	49.1	20.0	16.4	10.9	3.6
An invested casual worker can easily be lost other firms	34.5	30.9	21.8	9.1	3.6
It is expensive to train casual worker	24.1	38.9	24.1	5.6	7.4
Casual workers are ignorant about their health and safety rights	46.3	35.2	9.3	5.6	3.7
Casual workers are careless	46.2	21.2	15.4	9.6	7.7
Casual workers have less experience in the work they do	41.8	27.3	18.2	9.1	3.6
Casual workers lack understanding of health and safety norms/warning signs in construction industry	45.3	34.0	7.5	5.7	7.5
Casual workers have more accidents on site	37.0	37.0	13.0	3.7	9.3
Average ratings	41	30	16	7	6

Table 5.17: Results of Importance Indices Showing the Ranking of Concern Factor

FACTORS	WEIGHTING OF FACTORS										$\sum(n_i)$	I. INDEX	RANK
	1	n	2	n	3	n	4	n	5	n			

F1	2	2	6	12	9	27	11	44	27	135	220	80	3 rd
F2	2	2	5	10	12	36	17	68	19	95	211	76.72727	7 th
F3	4	4	3	6	13	39	21	84	13	65	198	73.33333	8 th
F4	2	6	3	6	5	15	19	76	25	125	228	82.96296	1 st
F5	4	4	5	10	8	24	11	44	24	120	202	77.69231	6 th
F6	2	2	5	10	10	30	15	60	23	115	217	78.90909	4 th
F7	4	4	3	6	4	12	18	72	24	120	214	80.75472	2 nd
F8	5	5	2	4	7	21	20	80	20	100	210	77.77778	5 th

Where

VI = Very Important,

I = Important,

N = Neutral,

NI = Not Important

NVI = Not Very Important.

- F1 = Investing in casual workers has less of a long-term returns for their firms
- F2 = An invested casual worker can easily be lost to other firms
- F3 = It is expensive to train casual worker
- F4 = Casual workers are ignorant about their health and safety rights
- F5 = Casual workers are careless
- F6 = Casual workers have less experience in the work they do
- F7 = Casual workers lack understanding of health and safety norms in construction industry (e.g. warning signs)
- F8 = Casual workers have more accidents on site

Comment:

Indication from table 5.16 is that, about 50% of contractors in Kumasi think that investing in casual workers has long-run returns effect on the company. With the average rating of 47%, contractors are not happy about the ignorant of casual workers on their health and safety rights. Again, 47% of the contractors think that casual workers are careless as against 46% of contractors who thinks that casual workers lack the understanding of health and safety norms or warning signs in construction industry. About 42% the contractor believes that casual workers have less experience about the type of work they do

- When the above factors was ranked using Importance Index, it turned out that the most important issue influencing the displeasure of engaging casual workers on construction site, is their ignorant about their health and safety rights. This means that casual workers cannot even demand what is due them. An opportunist employer will ignore about their safety and make profit out of their ignorance. Another important issue is casual workers lack understanding of health and safety norms such as warning signs. This issue has a link to the education of casual workers. ILO in 2003 asserted that the high turnover of casual workers in the construction industry poses a considerable barrier to training.

5.5 REACTION TO SOME FACTORS INFLUENCING CASUALISATION IN THE CONSTRUCTION INDUSTRY

The socio-economic condition of the casual workers themselves is one of the reasons why casual workers want to continue to work in such unsafe conditions. For example during the ethnographical study by Buchanan (2004), the author found casual workers were unwilling to leave dangerous work situations because they recognised the turnover of workers and hence, worried that they would be replaced if they complained about safety hazards on construction site

Question: *Please on a scale of Very important to Not very important, indicate the extent to which the following statements influence your health and safety issues on construction site.*

The purpose of this question is to identify the most important issues that influence the occupational health and safety of casual worker and here casual workers were given some factors to rank on a scale of very important to not very important. Table 5.18 present the results.

Table 5.18: Results of Importance indices showing the ranking of socio-economic factors influencing the health and safety of casual workers on site

FACTORS	WEIGHTING OF FACTORS										$\sum(n_i)$	I. INDEX	RANK
	1	<i>n</i>	2	<i>n</i>	3	<i>n</i>	4	<i>n</i>	5	<i>n</i>			
F1	1	1	1	2	3	9	23	92	24	120	224	86.15385	1 ST
F2	0	0	0	0	9	27	25	575	18	432	1034	83.46154	2 ND
F3	0	0	2	4	8	72	29	725	12	216	1017	80	6 TH
F4	2	2	2	4	7	56	22	638	19	228	928	80.76923	5 TH
F5	0	0	4	8	5	35	25	550	18	342	935	81.92308	3 RD
F6	18	18	20	40	5	25	6	150	2	36	269	41.96078	9 TH
F7	1	1	7	14	4	20	20	120	20	40	195	79.61538	7 TH
F8	0	0	6	12	7	28	31	620	8	160	820	75.76923	8 TH
F9	1	1	7	14	2	14	18	558	23	184	771	81.56863	4 TH

Where

F1 = Have little or no schooling

F2 = Find it difficult in getting job

F3 = Are unfairly paid

F4 = Lack protection from the law, against dismissal, sickness, old age and incapacity

F5 = Have no ideas in the construction industry

F6 = Difficulty in meeting their basic needs

F7 = Faces the problem of non-payment of social security by employer

F8 = Lack training on the job

F9 = Have the fear of losing the job if health and safety rights are demanded

Comment:

Among other factors, casual workers ranked little or no schooling as the most important issue influencing their occupational health and safety. The little education of casual workers means that, most of them cannot read to understand safety signs or demand safety materials required for a particular job and this will make them vulnerable to accident on sites. Another factor is the difficulty they encounter in getting job in other sectors. This has allowed some of them to enter into the construction work without having knowledge about the industry, especially in area of health and safety norms (National Centre for Vocational Education Research, 2008). Kheni (2008) that casual workers feel they have suffered before getting job or staying at home without a job is a bitter lesson for them hence they will not bother to demand better condition of work.

5.6 SUMMARY

This chapter has presented the analysis and discussions of the results obtained from the collected data. The demography of the respondents has been analysed using descriptive statistics. Among others reasons, it concluded that the respondents were competent, experienced and capable of exercising sound judgment and that their responses could be relied on for the study.

The chapter has also reported the ranking results from one-sample t-test and Importance Index in respect to occupational health and safety (OHS) of casual workers on construction site. Also based on the findings, it was concluded that that the OHS issues of casual workers haven have been compromised and the social and economic condition of casual workers have also contributed to the situation. The next chapter presents the summary of how these findings and the conclusion were achieved throughout the various phases of the study

CHAPTER SIX

CONCLUSIONS AND RECOMMENDATIONS

6.0 INTRODUCTION

The aim of this research has been to study the occupational health and safety of the Ghanaian casual workers on building construction sites and to accomplish this aim, a number of objectives which were being guided by research questions were set. In this chapter, the research questions and the objectives are revisited to bring into light the extent to which the aim of the study has been achieved throughout the various phases of the study. The chapter also presents recommendations of the researcher based on the findings of the study and state the difficulties that were encountered throughout of the study.

6.1 RESEARCH QUESTIONS

The specific questions to the study include:

- What are the challenges facing Ghanaian contractor in respect of the recruitment of casual workers on occupational health and safety issues?
- What are the challenges facing casual workers in the labour market in Ghana?
- What are the contemporary occupational health and safety (OHS) issues confronting casual workers in the construction industry and how this can be incorporated into a framework to meet the challenges of the 21st century?

These research questions served as guidelines in achieving purpose of the study. The responses to these questions could be found in the five commented objectives listed.

6.2 COMMENTS ON OBJECTIVES

6.2.1 Objective One

To review literature on occupational health and safety issues of casual workers so as to get a deeper understanding of their health and safety related issues in the construction industry.

This objective has been achieved by undertaking an extensive review on casualisation in the construction industry in Ghana and other developing countries (see chapter 2 and chapter 3). The literature revealed that the occupational health and safety issues of casual workers in the Ghanaian construction industry are virtually not in existence. However, literature on occupational health and safety issues of casual workers in some developing countries such as Tanzania, Kenya, South Africa indicates that welfare facilities such as safe drinking water, means of heating food, water for washing and cooking, suitable accommodation for resting, catering services, sanitary facilities, accommodation to change and store clothing, and first-aid have not been provided to casual workers on construction sites. Also, the provisions of safety materials such as safety signs, protective gear, helmets, safety boots, gloves, nose masks, provision of first-aid facilities and working height accessories were lacking on sites for casual workers. Nevertheless, some employers seem to have some benefits and concerns in engaging casual workers.

Casual workers are readily available when their services are needed and they are cheaper to employ. These reasons coupled with the fact that casual workers are lower wage earners, means by which employers are able to make savings on labour. Some employers in developing countries enjoy the benefit that casual workers are alternative to permanent worker and others employ casual workers as of means of recruiting specific skills and knowledge they need, Some employers are of the view that investing in casual workers in areas such as training, has less of a long-

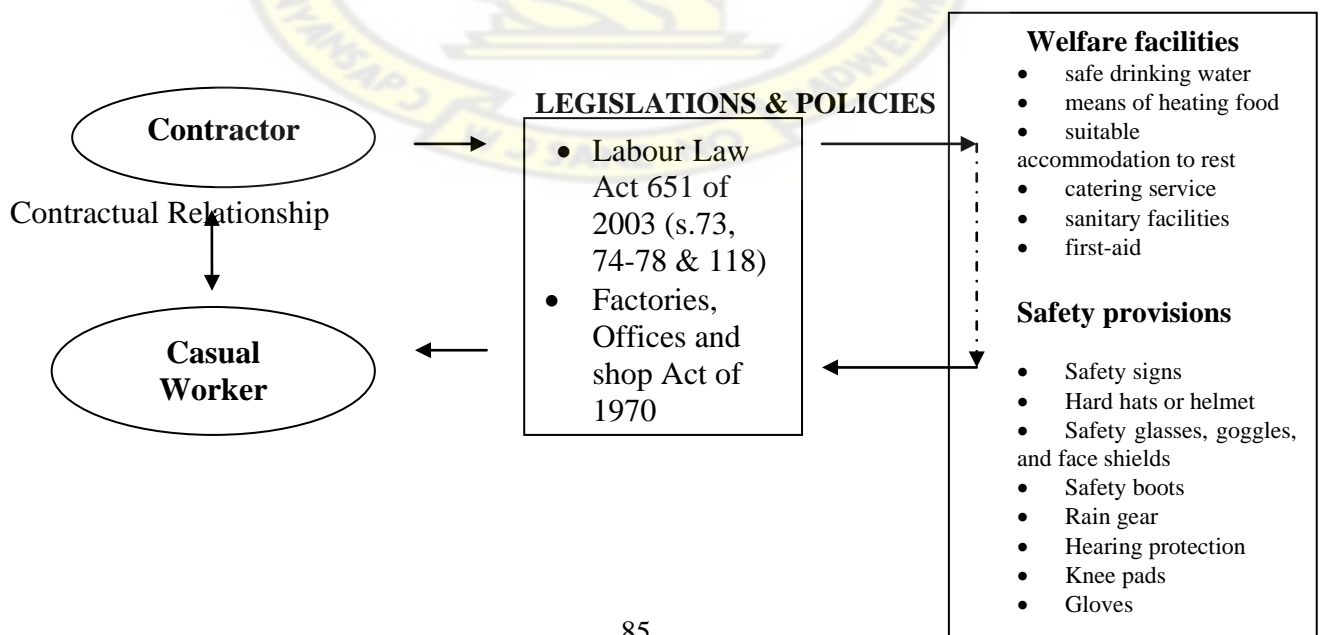
term returns for their firms. Others think that, the invested casual worker could easily be lost to other firms. It was also realised that it was expensive to train casual workers considering the high turnover of casual workers in the construction industry

The literature also revealed that some factors have also contributed to the occupational health of casual workers in the construction industry. For example, casual workers on construction sites in some of developing countries were found to have low or no education. it was also found that the quest of casual workers in meeting their basic needs such as food, shelter , have allowed most of them to enter into the construction work without having knowledge about the industry, especially in area of health and safety norms, and lacking safety training.

6.2.2 Objective Two

To develop a theoretical framework for evaluating the health and safety issues that confront a typical casual Ghanaian construction worker

This second objective has also been addressed by putting together the ILO's code of Practice on Safety and Health in Construction site 1992, The National labour Act 651 of 2003 and Factories, Offices and shop Act of 1970 to develop the framework presented below



Within the legislation and policies in the above framework, lies the National Labour Act 651 of 2003 and Factories, Offices and shop Act of 1970. The requirement of these laws in the context of OHS is projected form OHS issues. Section 118 of Act 651 explains how employers should manage the occupational health and safety of casual workers and the environment within which they work. This then places the responsibility of provision of welfare facilities and safety materials for the casual worker on the main contractor on site.

In conclusion, the above framework becomes the base line for measuring what the Ghanaian contractor provides for the casual worker and what the casual worker receive from the contractor with regards to occupational health and safety provisions. Indeed the framework seeks to confirm the provision and receipt of welfare facilities and safety materials for the Ghanaian casual worker on a construction site.

6.2.3 Objective three

To develop a questionnaire out of the framework to elicit data from site engineers, foremen and casual workers

The development of appropriate theoretical framework together with the methodology paved the way for the fulfilment of this objective. A Set of two different close-ended questionnaires were designed for employers and casual workers and they were to respond to questions on:

- welfare facilities and safety materials; and
- benefits and concern of engaging casual workers.

In conclusion, through the development of questionnaires, data on occupational health and safety on casual workers were obtained from owners/contractors, site engineers, project managers, foremen and casual workers. The details of these questionnaires can be found in appendix B

6.2.4 Objective Four

To analyse the data using appropriate analytical tools

This objective has also been fulfilled in that, all the analyses on the various issues on welfare facilities, safety materials, benefits and concerns of engaging casual workers were carried out using the Statistical Package for Social Sciences (SPSS) where some of the identified factors were ranked using one sample statistics means of importance and Importance Index. The chi-squared test was also carried out to determine the significant difference in responses between the employers and casual workers. From the analysis and discussions in chapter 5, the following findings and conclusions were drawn:

The findings indicate that 60% of building contractors in the Kumasi metropolis do not provide welfare facilities and safety materials to casual workers. The findings also indicate that first-aid equipments, safe drinking water, sanitary facilities, provision of personal protection equipment (PPE) and training of casual workers on safety procedures, were the measures needed for addressing the occupational health and safety issues confronting casual workers on construction sites.

On the issue of benefit of engaging casual workers on construction site, 79% of the contractors in Kumasi Metropolis indicated that the engagements of casual workers are beneficiary to their firms. When these benefits factors were ranked using the Importance Index, it turned out that the readily availability of casual workers was the most important factor influencing the decision of employing casual workers on construction sites. Next to this factor were, casual workers are lower wage earners and casual workers are in a weaker position to refuse to work in unsafe conditions.

Among other factors, the contractors in Kumasi Metropolis ranked the ignorant of casual workers about their health and safety rights as the most important factor influencing the displeasure of engaging them on construction site. Next to this factor was the lack of

understanding of health and safety norms on construction sites by casual workers. The third ranked factor was, investing in casual workers has less of long-term returns on their firms.

On the issues on the socio-economic conditions of casual workers, casual workers ranked their low or no schooling as the most important factor influencing their health and safety issues on construction site. This factor was then followed by the difficulty of casual workers getting job and the little or no idea they have in the construction industry.

In conclusion, the occupational health and safety of casual workers in the Ghanaian construction industry have been compromised as a result of the drive of economic and social behaviour of both employers and casual workers, coupled with the lack of or implementation of safety legislation and policies on construction sites.

6.2.5 Objective Five

From the findings, make recommendation policy makers to help protect the rights of casual workers.

The current practises of employers' towards the provision of welfare facilities and safety materials to casual workers on construction sites differ from the provisions stipulated in the National Labour Act 651 of 2003 and Factories, Offices and shop Act of 1970. This requires the intervention of Ghanaian policy makers to protect the health and safety, employment, and rights of casual workers.

6.2.5.1 Recommendations

In view of the above deviations for the provision of welfare facilities and safety materials to casual workers on construction sites, Ghanaian policy makers should be committed to implement the following recommendations:

- Safety Officers from Ghana Labour office should liaise with the Ministry of Water Resources, Works and Housing and in conjunction with Association of Civil Engineering and Building Contractors, regularly visit construction sites to ensure:

- the enforcement of laws governing health and safety, employment, and rights of casual workers; and
- They should also create awareness among casual workers the laws governing their occupational health and safety rights

- The establishment of institutions such like the Department of Building Technology, KNUST, The building and road Research Institute (BRRI) and some Non Governmental Organisations (NGOs) could be founded to organise training programmes and workshops for the workers and management in safety

- Contractors of the various construction firms should be encourage setting up Human Resource and Safety Departments for the purpose of executing safety education campaigns and training programmes for all levels of management and casual workers. The training is to deliver the content of how important these welfare facilities and safety materials are to the firms and the health of the casual workers. Safety education, on the other hand, transfers the concepts of why casual workers have to work safely and the effects of not adhering to safety measures on site. The former is a kind of skills provided, while the latter is a form of knowledge transfer.

- Since the training involves casual workers, the educational and training programmes will have to include the use of films or slides show. This will help the understanding of casual workers on matters relating to health and health and safety issues.

- The establishment of safety department will also monitor the use of safety materials and this will enhance safety awareness, which in turn leads to a safe and successful project.
- five to ten minutes each morning be apportioned to briefing on health and safety to all workers, including casual workers, before commencement of work, to inculcate in them safety awareness, and improving safety on construction sites.



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DEPARTMENT OF BUILDING TECHNOLOGY
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March 22, 2010

DBT/S.7B

Our Ref:.....

Your Ref:.....

Date:.....

TO WHOM IT MAY CONCERN

Letter of Attestation
Frederick Owusu-Danso

I write to confirm that the above named is an MSc student in the Department of Building Technology, Faculty of Architecture and Building Technology, KNUST, Kumasi.

He is writing a project entitled: "***Occupational Health and safety issues involving casual workers on Building Construction Site in Kumasi Metropolis, Ghana***"

I should be grateful if he would be given the necessary assistance he is seeking for .

Prof. Joshua Ayarkwa
Head of Department



APPENDIX 2

Department Of Building Technology
Kwame Nkrumah University of Science and Technology
University Post Bag
Kumasi.

SURVEY QUESTIONNAIRES

OCCUPATIONAL HEALTH AND SAFETY ISSUES INVOLVING CASUAL WORKERS ON BUILDING CONSTRUCTION SITES IN GHANA, A KUMASI STUDY

Dear Sir/Madam,

This questionnaire forms part of an MSc. research project which aims to study the occupational health and safety of the Ghanaian casual worker on the building construction sites for the purpose of highlighting the critical issues affecting the overall welfare and safety of casual workers on building construction sites. It is expected that this research will help to improve the conditions of these casual workers on sites and protect the rights.

I would like to invite you to participate in the above project. Completion of the questionnaire is completely voluntary and returning the completed questionnaire will be considered as your consent to participate in the survey. The questionnaire will take you about 5 minutes to complete.

I appreciate that you are already busy and that participating in this survey will be another task to add to a busy schedule, but by contributing you will be providing important information. **All data held are purely for research purposes and will be treated as strictly confidential.**

If you wish to receive feedback on the research findings, please complete the slip below and return it together with your questionnaire.

In the event of questions or queries, please do not hesitate to contact us. Thank you for your time and valid contribution in advance.

Yours faithfully,

Mr. Frederick Owusu Danso BSc
MSc Researcher
Email – ofreddanso@yahoo.com
Mobile: 0244530837

Prof. Edward Badu & Dr. D. K. Ahadzie
Supervisors of MSc Research

X.....X.....X

I wish to receive feedback on the research findings, please find my contact details below:

Name:	Email:
Tel:	Fax:
Address:	

KNUST



APPENDIX 3

DEPARTMENT OF BUILDING TECHNOLOGY

FACULTY OF ARCHITECTURE AND BUILDING TECHNOLOGY

COLLEGE OF ARCHITECTURE AND PLANNING

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY, KUMASI

EMPLOYERS ASSESSMENT ON HEALTH AND SAFETY ISSUES OF CASUAL WORKERS

A. PERSONAL / COMPANY'S DETAILS

1. Please Tick [✓] to indicate the category of your company

- a. D1, K1 []
- b. D2, K2 []
- c. D3, K3 []
- d. D4, K4 []

2. Please Tick [✓] to indicate your position in the company.

- a. Contractor []
- b. Project Manager []
- b. Site Engineer []
- d. Site Foreman []

Others please specify_____

3. Tick [✓] to indicate your educational level

- a. MSc []
- b. BSc []
- c. HND []
- d. Technician (CTC I,II and III) []

Others please specify_____

4. Tick [✓] to indicate how long you have been involved in the building construction industry

- a. Over 20 years ☐
- b. 16-20 years ☐
- c. 11- 15 years ☐
- d. 6-10 years ☐
- e. Up to 5 years ☐

5. Tick [✓] to indicate the % contributions of casual workers to your profit turnover. Please rate them according to the following

- a. Very High (over 90%) ☐ b. High (70- 90%) ☐ c. Average (50-69%) ☐
- d. Low (30-49%) ☐ e. Very Low (10-29%) ☐

6. Tick [✓] to indicate how many people currently work in your site?

a.Total Workmen on site

- 1-20 ☐
- 21-40 ☐
- 41-60 ☐
- 61-80 ☐
- 81-100 ☐
- 101> ☐

b. Permanent employees

- 1-20 ☐
- 21-40 ☐
- 41-60 ☐
- 61-80 ☐
- 81-100 ☐
- 101> ☐

c. Casual workers

1-20	[]
21-40	[]
41-60	[]
61-80	[]
81-100	[]
101>	[]

B. HEALTH AND SAFETY ISSUES

WELFARE ISSUES

7. There is general assertion that contractors do not provide the following welfare related facilities on construction site for casual workers. Please indicate your reaction to each statement by ticking the appropriate cell

Welfare Facilities	Strongly Agree	Agree	Neutra 1	Disagree	Strongly Disagree
Safe drinking water	[]	[]	[]	[]	[]
Means of heating food	[]	[]	[]	[]	[]
Water for washing and cooking	[]	[]	[]	[]	[]
Suitable accommodation to rest	[]	[]	[]	[]	[]
Catering service	[]	[]	[]	[]	[]
Sanitary facilities (toilets, showers, changing rooms)	[]	[]	[]	[]	[]
Accommodation to change and store clothing	[]	[]	[]	[]	[]
First-aid equipment	[]	[]	[]	[]	[]
Others please specify	[]	[]	[]	[]	[]

SAFETY ITEMS OR EQUIPMENT

8. There is general assertion that contractors do not provide the following safety related items or equipment on construction site for casual workers. Please indicate your reaction to each statement by ticking the appropriate cell

Welfare Facilities	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Safety signs	[]	[]	[]	[]	[]
Hard hats or helmet	[]	[]	[]	[]	[]
Safety glasses, goggles, and face shields	[]	[]	[]	[]	[]
Safety boots	[]	[]	[]	[]	[]
Rain gear	[]	[]	[]	[]	[]
Hearing protection	[]	[]	[]	[]	[]
Knee pads	[]	[]	[]	[]	[]
Gloves	[]	[]	[]	[]	[]
Safety nets	[]	[]	[]	[]	[]
Flashlights	[]	[]	[]	[]	[]
Ladder Scaffold platforms	[]	[]	[]	[]	[]
Hoisting equipment	[]	[]	[]	[]	[]
Others please specify	[]	[]	[]	[]	[]

9. Below are a number of welfare facilities and safety materials provided on sites for casual workers. On a scale of 1 to 5, 1 please rank these provisions to indicate the extent to which they are important for addressing the health and safety concerns of casual workers by ticking the appropriate cell

Very important = 5 Important = 4 Neutral = 3
Not important = 2 Not very important = 1

	5	4	3	2	1
Welfare Facilities					
Safe drinking water	[]	[]	[]	[]	[]
Means of heating food	[]	[]	[]	[]	[]
Water for washing and cooking	[]	[]	[]	[]	[]
Suitable accommodation to rest	[]	[]	[]	[]	[]
Catering service	[]	[]	[]	[]	[]
Sanitary facilities (toilets, showers, changing rooms)	[]	[]	[]	[]	[]
Accommodation to change and store clothing	[]	[]	[]	[]	[]
First-aid equipment	[]	[]	[]	[]	[]
Others please specify	[]	[]	[]	[]	[]

Safety Materials					
Safety signs	[]	[]	[]	[]	[]
Hard hats or helmet	[]	[]	[]	[]	[]
Safety glasses, goggles, and face shields	[]	[]	[]	[]	[]
Safety boots	[]	[]	[]	[]	[]
Rain gear	[]	[]	[]	[]	[]
Hearing protection	[]	[]	[]	[]	[]
Knee pads	[]	[]	[]	[]	[]
Gloves	[]	[]	[]	[]	[]
Safety nets	[]	[]	[]	[]	[]
Flashlights	[]	[]	[]	[]	[]
Ladder Scaffold platforms	[]	[]	[]	[]	[]
Hoisting equipment	[]	[]	[]	[]	[]
Training in safety	[]	[]	[]	[]	[]
Appointment of safety officer on site	[]	[]	[]	[]	[]

BENEFITS FACTORS

10. Please in a scale of Very important to Not very important, indicate the extent to which the following statements influence your decision to employ casual workers

Benefits Factors	Very Important	Important	Neutral	Not Important	Not Very Important
Casual workers are readily available	[]	[]	[]	[]	[]
Casual workers are cheaper to employ	[]	[]	[]	[]	[]
Casual workers are in the weaker position to refuse to work in unsafe conditions	[]	[]	[]	[]	[]
Casual workers are means of making savings on labour and safety equipment cost	[]	[]	[]	[]	[]
Casual workers provides an easy way for adjusting labour requirements	[]	[]	[]	[]	[]
Casual workers are alternative to permanent worker;	[]	[]	[]	[]	[]
Casual workers are lower wages earners	[]	[]	[]	[]	[]
Casual workers are means of employing specific skills and knowledge	[]	[]	[]	[]	[]
Casual workers do not need safety equipment because they care of themselves	[]	[]	[]	[]	[]
Casual workers are means of flexible	[]	[]	[]	[]	[]

employment					
Casual workers are means of avoiding labour taxes	[]	[]	[]	[]	[]
Casual workers are means of avoiding social security	[]	[]	[]	[]	[]
Casual workers are alternative due to duration of the project	[]	[]	[]	[]	[]

CONCERN FACTORS

Please in a scale of Very important to Not very important, indicate the extent to which the following statements influence the displeasure of engaging casual workers in your firm

Concern Factors	Very Important	Important	Neutral	Not Important	Not Very Important
Investing in casual workers has long-run return on the company	[]	[]	[]	[]	[]
An invested casual worker can easily be lost other firms	[]	[]	[]	[]	[]
It requires a great deal of money to train casual worker	[]	[]	[]	[]	[]
It requires time in the short run to train casual worker	[]	[]	[]	[]	[]
Casual workers poses a barrier to safety training in the construction industry	[]	[]	[]	[]	[]
Casual workers demand a lot in their health and safety rights	[]	[]	[]	[]	[]
They are ignorant about their work	[]	[]	[]	[]	[]
They ignorant about their health and safety rights	[]	[]	[]	[]	[]
Casual workers are careless	[]	[]	[]	[]	[]
Casual workers have different health and safety standards	[]	[]	[]	[]	[]
Have less experience of the type of work they are doing	[]	[]	[]	[]	[]
Lack understanding of health and safety norms/warning signs in construction industry	[]	[]	[]	[]	[]
Casual workers have more accidents on site	[]	[]	[]	[]	[]
Casual workers very work hard because they want to be permanent workers	[]	[]	[]	[]	[]
Casual workers do not use safety equipment issued to them	[]	[]	[]	[]	[]

KNUST



APPENDIX 4

DEPARTMENT OF BUILDING TECHNOLOGY

FACULTY OF ARCHITECTURE AND BUILDING TECHNOLOGY

COLLEGE OF ARCHITECTURE AND PLANNING

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY, KUMASI

CASUAL WORKER ASSESSMENT HEALTH AND SAFETY ISSUE

A. PERSONAL DETAILS

1. How long have been working as casual worker in this company?

a. up to 6 months ☐

b. more than 6 months ☐

2. Please tick [☐>] to indicate your age range

<18 ☐

18-29 ☐

30-39 ☐

40-49 ☐

50 & above ☐

3. How did you join construction?

Through labour office ☐

Through friends or relatives ☐

Apprentice ☐

Personal search (at the entrance gate of the company) ☐

Other (please specify) _____

4. Please tick [☐>] to indicate your educational level

a. Never been to school ☐

b. MSLC ☐

- c. BECE ☐
- d. VOC / TECH ☐
- e. Secondary and higher ☐

B. HEALTH AND SAFETY ISSUES

WELFARE ISSUES

5. There is general assertion that contractors do provide the following welfare related facilities on construction site for casual workers. Please indicate your reaction to each statement by ticking the appropriate cell

Welfare Facilities	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Safe drinking water	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Means of heating food	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Water for washing and cooking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Suitable accommodation to rest	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Catering service	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sanitary facilities (toilets, showers, changing rooms)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Accommodation to change and store clothing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
First-aid equipment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Others please specify	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

C. SAFETY ITEMS OR EQUIPMENT

6. There is general assertion that contractors do provide the following safety related items or equipment on construction site for casual workers. Please indicate your reaction to each statement by ticking the appropriate cell

safety items or equipment	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Safety signs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hard hats or helmet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Safety glasses, goggles, and face shields	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Safety boots	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Rain gear	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Hearing protection	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Knee pads	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Gloves	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Safety nets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Flashlights	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ladder Scaffold platforms	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
hoisting equipment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Others please specify	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

7a. Are you aware the contractor has to provide you with welfare facilities and safety equipment on site?

Yes ☐

No ☐

b. If yes, why are you still working? Please you can [√] one or more

There Is No Job Else Where ☐

Have To Take Of Family ☐

It Is Difficult Getting Job ☐

Because Of Income ☐

8. Please in a scale of Very important to Not very important, indicate the extent to which the following statements influence your health and safety issues on construction site. Please Tick [√] the appropriate cell

Socio-Economic Condition	Very Important	Important	Neutral	Not Important	Not Very Important
Have Little or no schooling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Find it difficult in getting job	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are unfairly paid	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack protection from the law, against dismissal, sickness, old age and incapacity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Have no ideas in construction industry before recruitment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Difficulty in meeting basic needs such as food, shelter	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Faces the problem of non-payment social security by the employer	[]	[]	[]	[]	[]
Lack training on the job	[]	[]	[]	[]	[]
Have the fear of losing job if demands are made on my right to health and safety	[]	[]	[]	[]	[]

KNUST

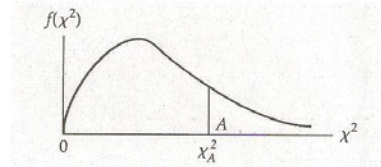


APPENDIX 5

APPENDIX C

CRITICAL VALUES FOR χ^2

Table 5

Critical Values of χ^2 

DEGREES OF FREEDOM	$\chi^2_{.995}$	$\chi^2_{.990}$	$\chi^2_{.975}$	$\chi^2_{.950}$	$\chi^2_{.900}$	$\chi^2_{.800}$	$\chi^2_{.700}$	$\chi^2_{.600}$	$\chi^2_{.500}$	$\chi^2_{.400}$	$\chi^2_{.300}$	$\chi^2_{.200}$	$\chi^2_{.100}$	$\chi^2_{.050}$	$\chi^2_{.025}$	$\chi^2_{.010}$	$\chi^2_{.005}$
1	0.000393	0.000157	0.000982	0.003932	0.015790	2.70554	3.84146	5.02389	6.63490	7.87944							
2	0.010025	0.020100	0.050636	0.102587	0.210720	4.60517	5.99147	7.37776	9.21034	10.5966							
3	0.071721	0.114832	0.215795	0.351846	0.584375	6.25139	7.81473	9.34840	11.3449	12.8381							
4	0.206990	0.297110	0.484419	0.710721	1.063623	7.77944	9.48773	11.1433	13.2767	14.8602							
5	0.411740	0.554300	0.831211	1.145476	1.61031	9.23635	11.0705	12.8325	15.0863	16.7496							
6	0.675727	0.872085	1.237347	1.63539	2.20413	10.6446	12.5916	14.4494	16.8119	18.5476							
7	0.989265	1.239043	1.68987	2.16735	2.83311	12.0170	14.0671	16.0128	18.4753	20.2777							
8	1.344419	1.646482	2.17973	2.73264	3.48954	13.3616	15.5073	17.5346	20.0902	21.9550							
9	1.734926	2.087912	2.70039	3.32511	4.16816	14.6837	16.9190	19.0228	21.6660	23.5893							
10	2.15585	2.55821	3.24697	3.94030	4.86518	15.9871	18.3070	20.4831	23.2093	25.1882							
11	2.60321	3.05347	3.81575	4.57481	5.57779	17.2750	19.6751	21.9200	24.7250	26.7569							
12	3.07382	3.57056	4.40379	5.22603	6.30380	18.5494	21.0261	23.3367	26.2170	28.2995							
13	3.56503	4.10691	5.00874	5.89186	7.04150	19.8119	22.3621	24.7356	27.6883	29.8194							
14	4.07468	4.66043	5.62872	6.57063	7.78953	21.0642	23.6848	26.1190	29.1413	31.3193							
15	4.60094	5.22935	6.26214	7.26094	8.54675	22.3072	24.9958	27.4884	30.5779	32.8013							
16	5.14224	5.81221	6.90766	7.96164	9.31223	23.5418	26.2962	28.8454	31.9999	34.2672							
17	5.69724	6.40776	7.56418	8.67176	10.0852	24.7690	27.5871	30.1910	33.4087	35.7185							
18	6.26481	7.01491	8.23075	9.39046	10.8649	25.9894	28.8693	31.5264	34.8053	37.1564							
19	6.84398	7.63273	8.90655	10.1170	11.6509	27.2036	30.1435	32.8523	36.1908	38.5822							
20	7.43386	8.26040	9.59083	10.8508	12.4426	28.4120	31.4104	34.1696	37.5662	39.9968							
21	8.03366	8.89720	10.28293	11.5913	13.2396	29.6151	32.6705	35.4789	38.9321	41.4010							
22	8.64272	9.54249	10.9823	12.3380	14.0415	30.8133	33.9244	36.7807	40.2894	42.7956							
23	9.26042	10.19567	11.6885	13.0905	14.8479	32.0069	35.1725	38.0757	41.6384	44.1813							
24	9.88623	10.8564	12.4011	13.8484	15.6587	33.1963	36.4151	39.3641	42.9798	45.5585							
25	10.5197	11.5240	13.1197	14.6114	16.4734	34.3816	37.6525	40.6465	44.3141	46.9278							
26	11.1603	12.1981	13.8439	15.3791	17.2919	35.5631	38.8852	41.9232	45.6417	48.2899							
27	11.8076	12.8786	14.5733	16.1513	18.1138	36.7412	40.1133	43.1944	46.9630	49.6449							
28	12.4613	13.5648	15.3079	16.9279	18.9392	37.9159	41.3372	44.4607	48.2782	50.9933							
29	13.1211	14.2565	16.0471	17.7083	19.7677	39.0875	42.5569	45.7222	49.5879	52.3356							
30	13.7867	14.9535	16.7908	18.4926	20.5992	40.2560	43.7729	46.9792	50.8922	53.6720							
40	20.7065	22.1643	24.4331	26.5093	29.0505	51.8050	55.7585	59.3417	63.6907	66.7659							
50	27.9907	29.7067	32.3574	34.7642	37.6886	63.1671	67.5048	71.4202	76.1539	79.4900							
60	35.5346	37.4848	40.4817	43.1879	46.4589	74.3970	79.0819	83.2976	88.3794	91.9517							
70	43.2752	45.4418	48.7576	51.7393	55.3290	85.5271	90.5312	95.0231	100.425	104.215							
80	51.1720	53.5400	57.1532	60.3915	64.2778	96.5782	101.879	106.629	112.329	116.321							
90	59.1963	61.7541	65.6466	69.1260	73.2912	107.565	113.145	118.136	124.116	128.299							
100	67.3276	70.0648	74.2219	77.9295	82.3581	118.498	124.342	129.561	135.807	140.169							

SOURCE: From C. M. Thompson, "Tables of the Percentage Points of the χ^2 -Distribution," *Biometrika* 32 (1941): 188-89. Reproduced by permission of the Biometrika Trustees.

APPENDIX 6



Steel benders working on reinforcement bars in foundation without gloves, helmets of safety boots



A labourer without safety boots



Artisan on scaffold without protective cloth, boot and helmet

