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A STUDY OF CHALLENGES FACED BY REGULATORY AUTHORITIES FOR IMPLEMENTING HEALTH AND SAFETY COMPLIANCE IN THE GHANA CONSTRUCTION INDUSTRY CONTEXT

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ABSTRACT

In general, the construction industry is one of the world's occupational settings that has high incidents of fatalities and injury rates. Developing countries, Ghana inclusive are faced with much more challenges to effective management of occupational health and safety due to the increasing rate of industrialization and weak occupational health and safety framework. The study aims to investigate the challenges faced by the regulatory authorities. The study adopted a quantitative approach and collect data using a survey. The findings indicated that Regulatory Institutions (RIs) faced challenges like; a lack of comprehensive national OHS policy, lack of effective supervision and inability to prosecute companies who violate health and safety standards, lack of adequate resources on-site, lack of logistics, and lack of a well-defined framework for regulating health and safety standards. It is recommended that the government adequately resourced Regulatory Institutions (RIs) to effectively carry out their mandate to significantly reduce risk and accidents on construction sites.

Keywords: Health and Safety, Compliance, Construction, Contractors, Projects, Ghana.

INTRODUCTION

Background to the Study

An accident is usually an unplanned and unexpected event, which results from a mistake somewhere, somehow and by somebody, some of these mistakes result from easily recognisable hazards, which are preventable. The designer, the contractor or even the worker may make the mistake (Ward, 1979 as cited in Aniekwu). Danso (2005), quoted reports that the construction industry recorded 902 accident cases in the year 2000. Comprising 56 fatal accidents and 846 non-fatal accidents. ILO (1996) estimates show that two million women and men worldwide die each year because of occupational accidents and work-related illnesses. WHO estimates that 160 million new cases of work-related illnesses occur every year, and stipulates that workplace conditions account for over a third of back pain, 16 per cent of hearing loss, nearly ten per cent of lung cancer; and that eight per cent of the burden attributable to depression are workplace risk (Biddle, 2001 as cited in Ametepeh, 2011). Furthermore, the ILO's global estimates for 2003 indicated that each year at least 60,000 fatal accidents occur on construction sites around the world or one fatal accident every ten minutes. Admittedly, Construction is a dangerous industry, Worldwide, the ILO has estimated that it accounts for 100, 00 fatalities annually, some 30 to 40 per cent of fatal occupational injuries overall (ILO, 2005). Therefore, the risk of serious injury or death at work in this sector is considerably greater than in others. Zimolong and Elke (2006) observed that most injuries result from minor hazards at the workplace. Slip, trip and fall incidents are the most common incidents when performing normal activities. Zimolong and Elke (2006) further stated that a smaller proportion of injuries result from hazardous activities. These hazards are generic for the type of work performed; working at height, with electricity, with gases under pressure etc. Aniekwu (2007) buttressed this assertion by identifying some factors that result in an accident. These include the use of faulty tools and equipment; non-compliance to standard safety rules and regulations; poorly maintained and or inadequate scaffolding; lack of experience; and improper handling and storage of flammables such as explosives and combustibles. The rest are improper handling of tools and equipment; worker fatigue and boredom; improper supervision; management attitude and action on safety matters; inadequate management of work environment; faults in design detailing and specification; faulty construction techniques; worker's physical condition; lack of job satisfaction by workers; and monotony (constant exposure to a particular job).

The construction industry in Ghana recorded 902 accident cases comprising 56 fatalities in 2000 and 846 non-fatal accidents (Laryea & Sarfo, 2010; Danso, 2005 as cited in Danso et al. 2012). Data gathered by the current researcher from the Labour Office Accident records Book at Kumasi buttressed Danso's prediction. The records showed that there were 565 industrial accidents from February 2010 to November 2014. Out of this number, construction projects recorded 64 cases representing 11.33%. Sixteen of these were fatal. The breakdown of the construction project accidents is as follows: from February 2010 to December 2010, the number of recorded construction project accidents in Kumasi was 15 with two fatalities. That of 2011 was seven with two fatalities. (Indeed, there was a remarkable drop in 2011). In 2012, the

number shot to five fatalities –the highest among the years under consideration. The year 2013 recorded 18 construction project accidents with four fatalities. From January to November the following year, the records stood at four construction project accidents with three fatalities. It is worth noting that within five years, 16 lives were lost through construction project accidents. The question arising is would Ghana ever record zero accidents in construction projects? What roles are the regulatory institutions playing to curb this menace?

In the Ghanaian construction industry, workers suffer various degrees of industrial accidents leading to injuries and death. The current one happened at Cantonment in the Greater Accra Region where one person was crushed to death and twelve others sustained serious injuries after a four-storey building they were constructing collapsed on them. The structure buried the deceased under tons of rubble

The state institutions that visited the accident site were the Ghana National Fire Service (GNFS) and NADMO (Bokpe, 2014). There are many Statutes, which indirectly deal with occupational safety and health. These include the Environmental Protection Agency Act. 490 (1994); the Ghana Health Service and Teaching Hospital Act. 526, (1999); Occupational Safety and Health Recommendation (1981); and the Labour Act 615, sections 118 to 120 direct employers and employees in their roles and responsibilities in managing occupational health and safety in the nation. However, none of these acts stated clearly to who to report accidents and occupational illnesses. Nevertheless, the concept of monitoring and ensuring employee safety and health is gradually becoming acceptable in many sectors of Ghanaian industries.

The nation has seen some positive Safety and Health Practice policies by monitoring institutions and employers. Therefore, the need for effective management of health and safety policies in controlling accidents on-site must continue. It is also important that all parties involved should critically consider safety. Regular safety meetings, training and thorough inspection are essential. This enables the parties involved in a project to be aware of the progress of safe working conditions on-site. Proposals submitted by subcontractors to undertake sub-works should conform or agree with health and safety policies prepared by the contractor. The prevention of accidents in construction is largely a matter of education, vigilance and cooperation by everyone involved in the project. This research seeks to investigate how the regulatory institution tasked with ensuring quality construction, safety principles, survival, well-being and safety of workers affected construction projects.

Aim and Objective of the Study

The study aims to identify key challenges faced by regulatory institutions in ensuring the implementation of health and safety standards on project sites in Ghana.

Significance of the Study

Admittedly, one of the basic goals of organizations is to optimize human resources to achieve set targets. Matters relating to health and safety within an organization are critical in achieving set goals. Industrial accidents and illness make up one of the largest parts of loss of production time in the industry and these injuries have posed major challenges to the most construction project. Companies have suffered long spells or production shortfalls, compensation payments, insurance premiums and legal battles due to injury, reduction in the quality of life, family problems and decrease in life span and other effects which qualitatively cost employees, organizations, society and the nation, in general, is impossible to evaluate. This study is therefore significant for the following reason:

- Findings from the study will add up to existing knowledge on the subject under study;
- The outcome would enhance the performance of regulatory institutors in ensuring safety standards;
- Construction industries can utilize the findings to curb the alarming rate of industrial accidents resulting in injuries and deaths;
- Increase the awareness about health and safety in the construction industry and reveal the weaknesses strategies employers adopt to enhance health and safety standards.

Limitations

The major limitations of the study were that some respondents were reluctant to answer the questionnaire and to grant the researcher interviews, which was necessary for the study for fear that providing the right information may affect their institutions directly or indirectly. In addition, the retrieval of the questionnaire distributed to respondents was a big task because most of the respondents could not answer the questionnaire due to their work schedules. Moreover, the scope of the study, which covers the entire country, was too extensive for only two years. It thus poses a big challenge for the researcher to come out with a comprehensive mixed-method design.

LITERATURE REVIEW

Health and Safety in Project Life Cycle

Management and planning are one way to avoid unplanned events. Since accidents are unplanned events, effective safety management can help avoid job injuries. Safety management must be thorough, and it must apply to all aspects of the job, from the defining phase of the project until the last worker has left the premise after the other because in the safety program every party is responsible (Al-Kilani, 2011). Design error is one of the most frequent causes of system failure and accidents in the process industries. However, many people have overlooked it in risk analysis of process systems and control systems. A design error is a feature of a design, which makes it unable to perform according to its specification. A design rarely fails under all circumstances. The definition generally means that there are some circumstances, within the scope of the specification, under which the system does not match its specification (Taylor 2007).

Health and safety management starts from the defining phase of the construction project where the designer sets the goals of the project, considers specifications and conducts feasibility studies on the project. In addition, he sets the tasks and responsibilities of all parties involved in the project before the project commences. Health and safety in the planning phase of the construction project are very significant since it involves resources, risks, staffing and schedules for all activities that take place on-site including the movement of materials, the workforce and machinery. The budget for the project must as well target the health and safety standards of the construction company undertaking the project. Furthermore, health and safety at the executing phase of a project life cycle are of paramount importance because the greatest physical activities of the execution of the project take place at this phase. Compromising safety will affect the quality of the project adversely, workers become motivated if they know mechanisms put in place to ensure their safety. The designer must hold Health and safety in high esteem during the delivery phase of a project where work is completed and handed over to the client.

Regulatory Institutions and Health and Safety

Triadic relationships exist between the Regulatory Institutions (RI), Employers and Employees. As indicated in Fig.1. the more the regulatory institution frequently interacts with the employers to make sure that OHS policies are implemented, the more

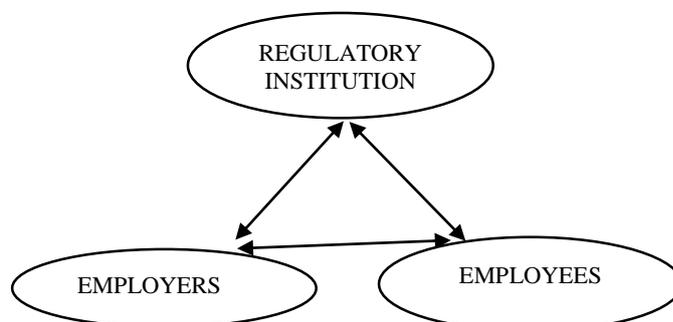


Figure 1: Triadic Interactive Model-Source (Author's Field Note, 2014)

The employers also ensure that the employees observe safety on site. In like manner, the more the regulatory institutions communicate with employees for confirmation of the implementation of OHS policies on-site, the more the employees interact with the RLs by reporting industrial accidents that resulted in injuries and fatalities in the industry. As noted in African Newsletter on OHS (2014), communication must have an impact; otherwise, it will be of no use. As such, the following is worth considering;

- Ensuring that the message reaches the intended audience,
- Ensuring that the message is usable and useful to the target audience,
- To involve the audience there must be structures and tools for feedback.

Challenges Facing Regulatory Institutions in Ghana

Many kinds of OHS issues are affecting Ghana. One most important issues pertains to dealing with the OHS challenge facing the regulatory institutions. It is obvious that the country has realized the benefits of OHS rather late; hence there are challenges in implementing OHS practices. One major challenge is that Ghana does not have any comprehensive national policy (Annan et al., 2014). This resulted in different Public institutions regulating their activities on behalf of the government differently as financiers, suppliers, regulators, clients, or paymasters (Edmonds & Miles, 1984). Non-government organizations, which significantly influence the activities of the industry, include trade unions, employers' organizations, private clients, donor agencies, professional institutions research institutions, and private educational institutions (Kheni et al, 2008).

A critical link in the health and safety programme is the ability of supervisors to investigate accidents and incidents (with the potential to progress in accidents) occurring in the workplace. The ultimate objective is to review all unsafe conditions to determine whether there are any control measures in place and whether they are performing as they should. Accidents and incidents are documented investigations on forms appropriately designed for that purpose and communicated to staff and management. It is also a statutory obligation that employers report accidents to the appropriate authorities (MOH, 2010). Writing in the same vein, Laryea (2010) stated that employers report all accidents or work-related illnesses to the appropriate authorities within a stipulated time. There are health and safety problems on almost all construction sites that need reporting. However, employers and victims do not report them to the right institutions

for action. British Safety Council, (2009) confirmed this. It indicated that the reporting of both work-related accidents and ill-health is poor across the world. Although some regions report accidents better than others, there is a need for much improvement in all countries. The ILO is calling for countries to develop national programmes including targets and indicators of progress. To do this, countries will first have to develop more reliable reporting systems.

The researcher's field Note (2015) revealed the following challenges faced by the regulatory institutions in Ghana:

- Some companies do not want to pay compensation to accident victims therefore reporting an accident case is a secondary matter to them;
- Most companies use outmoded methods of documenting accidents, resulting in inaccurate records and difficulty in data retrieval,
- Most regulatory institutions do not have adequate personnel to go around the numerous construction project sites spread all over the country,
- Some construction companies and the so-called 'one-man-contractors' are not willing to register with the regulatory institutions, making it extremely difficult to track their activities.

METHODOLOGY

Research Design

A research design is a blueprint for fulfilling research objectives and answering research questions. It is the master plan specifying the methods and procedures for collecting and analyzing the needed information. It ensures that the information the researcher has collected is appropriate for solving a problem (Adams, Khan, & White, 2007). The researcher adopted quantitative research to achieve the objective of the study.

Population

According to Fraenkel and Warren (2002), population refers to the complete set of individuals (subjects or events) having common characteristics which the researcher is interested in studying. Shao (1999) on the other hand defined population as the complete set of subjects that one can study: people, objects, animals, plants, and organizations from which one may obtain a sample.

A sampling frame by definition is a list of the people or items from which one takes a statistical sample (Microsoft Encarta, 2009). The study targeted the regulatory institutions considered from the three selected regions the Labour Department, the Department of Factories Inspectorates, Fire Service and the Environmental Health and Sanitation Department of the Environmental Protection Agency with a total list of 217. Table 1 Indicates the list of health and safety personnel in these departments.

Table 1
List of Regulatory Institutions from the Three Selected Regions.

Regulatory Institutions	Greater Accra	Ashanti	Volta	Total
Labour Dept.	30	21	17	68
Factors Inspt.	14	7	7	28
Fire Service	15	10	15	40
Environmental Prot. Agency	39	26	16	81
Total	98	64	55	217

Source: (Researcher's field Note 2015)

Sampling Technique and Sample Size

Kumar (1999) explains that a sample is a sub-group of the population which is an ideal representative of the entire population. The sampling approach adopted for the study followed a sequential process (Teddlie & Yu, 2007), sampling involving a systematic sampling with a random start for the selection of respondents from contractors for participating in questionnaires, and a census was conducted to select officers of regulator institutions. Systematic random sampling is by first selecting the sample element in a finite sequence at equal spacing (sample interval) from each sample. The population is then divided into subgroups, each having a total number of elements equal to the sample interval. The first member for the sample is then selected randomly from the first interval. Starting from the first member thus selected, every *n*th element from it is selected. The sample interval is calculated as;

$$\text{Sample Interval} = \frac{\text{population size}}{\text{sample size}}$$

Also, Baffour, King and Valente (2013) indicated that the census is considered the best when conducting research on small population groups in terms of area or membership. Furthermore, the census is a pivotal part of the official statistics produced by a country because it, typically, provides the benchmark for the population count at national and local levels. The quantitative sample size for the study comprising of Project Managers, Civil Engineers and Architect, as well as Labour Officers, Factories inspectors and EPA Safety Officers.

Data Collection

The study employed quantitative methods or data collection. This approach is similar to the view of Flyvbjerg (2004), that more often than not, a combination of qualitative and quantitative methods will do the task best. The researcher used questionnaires, interviews, observation and digital camera data collecting techniques or instruments to elicit data from the population. These institutions covered included Contractor's Association, Labour Department, Factories Inspectorate, Environmental Protection Agency and Fire Service.

Questionnaires Development

it sought the opinions of regulatory institutions on challenges to health and safety standards implementations on construction sites and how to respond to them (refer to Appendix –Annex 5&6).

Analysis of Data

Data were analyzed using statistical programs like the Statistical Package for Service Solution (SPSS) version 20.0 with statistical tools like Descriptive statistics. The researcher employed some measures of central tendencies such as the Mean and the Standard Deviation (SD). The study also used Factor Analysis (FA), a data reduction tool for simplification to interpret data from respondents. The researcher coded Likert scale questions before entering them into the computer.

PRESENTATION AND ANALYSIS OF RESULTS

Demographic Characteristics of Regulatory Institutions

Regulatory institutions, unlike an acephalous system, have well-defined departments and positional structures with the requisite staff to synchronize their activities for the achievement of the organization's objective. This section seeks to find out the position of respondents concerning their organization. From the data gathered, Labour Officer recorded a frequency of

forty-two out of 143 persons, representing 29.4% of respondents. Factory Inspectors recorded a frequency of sixteen persons, representing 11.2% of respondents; while Fire Safety Officers recorded a frequency of twenty-seven persons, representing 18.9% of respondents. Finally, EPA Safety Officer obtained the majority frequency of 58 persons, representing 40.6% of respondents. It is worth noting that, all these safety officers play major roles in terms of legislation, registration, monitoring and supervision of construction companies to ensure health and safety standards on construction sites in Ghana.

Table 2
Position in Organization

	Frequency	Valid Percent (%)
Labour Officer	42	29.4
Factories Inspector	16	11.2
Fire Safety Officer	27	18.9
EPA Safety Officer	58	40.6
Total	143	100.0

Source: (Author’s field Note 2015)

Types of Works Respondents Inspect

Regulatory institutions are independent of government agencies established by legislative acts to set standards in specific fields of human activity. They play a regulatory and supervisory i.e. codifying and enforcing rules and regulations and exercising oversight of human activities in a field for the public good. The study considered the type of work inspected by respondents from the regulatory institutions. These heavy manufacturing industries, offices, laboratories, construction, hospitals and other areas are not captured in this write-up. Fig 2 indicated that most of the respondents are into the supervision of shops (28% of respondents); followed by manufacturing industries (27% of respondents). The construction industry comprising Civil Engineering and Building construction recorded 23% while the supervision of offices and other areas recorded 18% and 4% respectively. This is an indication that, since respondents have been supervising construction projects, they have a fair understanding of construction activities and how health and safety are practised on sites.

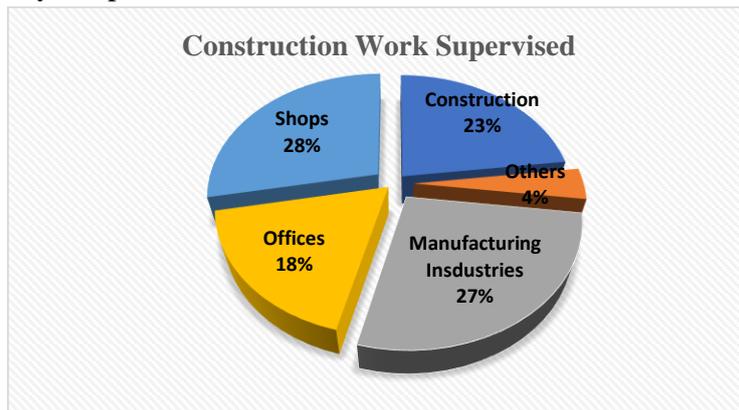


Figure 2: Types of Work Inspected by Regulatory Institutions, Source: (Author’s Field Survey, 2015)

Challenges faced by Regulatory Institutions in the Implementation of Health and Safety Standards on Construction Sites

This section of the study identifies all the various challenges as well as the key challenges faced by regulatory institutions in the implementation of health and safety standards on construction project sites in Ghana. The major aim of factor analysis is the orderly simplification of a large

number of inter-correlated measures into a few representative constructs. The main assumption of factor analysis involves having sufficient significant correlations in the data matrix. In other words, the researcher must ensure that the data matrix has sufficient correlations to justify the application of factor analysis. If a visual inspection reveals no substantial number of correlations of 0.33 or greater, then factor analysis is probably inappropriate.

The first step in factor analysis is the computation of the correlation matrix which measures the relationship between any two of the variables. The computed correlation matrix shows clearly that, there exist some fairly strong relationships among the variables. (See Appendix-Annex 2). Table 3 shows Bartlett's test of Sphericity which is used to test for the adequacy of the correlation matrix. (i.e., whether the correlation matrix has a significant correlation among at least some of the variables). The KMO and Bartlett's test, test the null hypothesis that there is no relationship/dependencies among the variables. From Table 3, the Bartlett test of Sphericity yielded a value of 511.928 and a *p-value* of 0.000. By rule, if the *p-value* is less than the default significance level of 0.05 we reject the null hypothesis. Hence since the *p-value* of 0.000 is less than the 0.05 level of significance, we reject the null hypothesis and conclude that almost all variables measuring challenges faced by regulatory institutions in the implementation of health and safety standards on the project sites are related to or dependent and hence we can proceed with factor analysis.

Table 3
KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.071
Bartlett's Test of Sphericity	Approx. Chi-Square	511.928
	Df	136
	P-value	.000

The communality table in Table 4 indicated that the proportion of variance in each variable accounted for the common factors. From the table, the common factors extracted would account for not less than 50% per cent of the total variation for each variable. In other words, the extracted factors put together will explain the challenges with the least correlation being 0.530.

Table 4
Communalities

Challenges Faced by Regulatory Institutions	Initial	Extraction
Lack of comprehensive national OHS policy	1.000	.689
Lack of effective supervision from regulatory institutions.	1.000	.695
Lack of control measures to check the activities of construction companies.	1.000	.717
Improper documentation of accidents and incidents investigations.		
Accident cases are not reported to the appropriate authorities.	1.000	.684
Timeframe for reporting accidents or work-related illnesses to regulatory institutions is normally delayed.	1.000	.590
Construction companies are unwilling to pay compensation to accident victims.	1.000	.769
Outmoded documentation of accident cases. (Keeping accident records in Note Books).		
Lack of adequate resources to facilitate the implementation of health and safety regulations on construction project sites.	1.000	.745
Refusal of construction companies to register with regulatory institutions.	1.000	.697
Inability to prosecute defaulting construction companies who fail to observe safety standards.	1.000	.673
Health and safety stakeholders influencing activities on construction project sites.		
Difficulties in monitoring the activities of construction projects due to lack of visibility of project sites.	1.000	.558
Cost of organizing health and safety training and workshops.	1.000	.745
Lack of logistics to organize sector-specific health and safety programmes.		

Lack of cooperation of project team with health and safety regulatory agencies.	1.000	.738
Lack of a specific legal framework for regulating health and safety standards in the construction industry in Ghana.	1.000	.451
<i>Extraction Method: Principal Component Analysis.</i>	1.000	.530
	1.000	.706
	1.000	.639
	1.000	.835

Source: (Author's field Note, 2015)

Table 4 presents the number of common factors computed, the eigenvalue associated with the computed factors, and the percentage of total variance accounted for by the common factors. Using the principal component method of factor extraction, the number of factors for extraction will be as many as the existing variables. In extracting the needed factors, one ought to use the eigenvalue method to extract factors with an eigenvalue of 1 or greater. Table 5, retained the first seven (7) factors extracted since they assume an eigenvalue of one or more and all the seven factors account for approximately 67 per cent of the total variance explained. The remaining factors for only 33 per cent, which is not representative compared to the first seven. Hence, one will require a model with seven factors to represent the data.

Table 5

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loading			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.916	23.038	23.038	3.916	23.038	23.038	2.042	12.012	12.012
2	1.622	9.541	32.580	1.622	9.541	32.580	1.866	10.976	22.988
3	1.425	8.380	40.960	1.425	8.380	40.960	1.775	10.441	33.429
4	1.288	7.574	48.534	1.288	7.574	48.534	1.566	9.212	42.640
5	1.138	6.695	55.229	1.138	6.695	55.229	1.497	8.809	51.449
6	1.045	6.145	61.374	1.045	6.145	61.374	1.412	8.303	59.752
7	1.025	6.030	67.405	1.025	6.030	67.405	1.301	7.653	6.405
8	.850	5.002	72.407						
9	.784	4.613	77.020						
10	.689	4.053	81.073						
11	.618	3.633	84.706						
12	.587	3.452	88.156						
13	.531	3.121	91.279						
14	.449	2.638	93.917						
15	.377	2.219	96.136						
16	.342	2.010	98.146						
17	.315	1.854	100.000						

*Extraction Method: Principal Component Analysis. Source; (Author's field Note 2015)

The component matrix in Table 6 presents the correlations that relate the variables to the seven extracted factors. These coefficients as summarized in the table called factor loadings indicate that the variables are closely related to each factor. However, since one has extracted the factors based on the proportion of total variance explained, there was a significant un-rotated loading shown in Table 6. (i.e. a variable is explained by two or more factors at the same time with

highly associated correlation coefficient values). The second variable is found to be highly loaded with factors 1, 2 and 7 at the same time indicating possible cross-loading. Similarly, variables 3 ends 4 are also cross-loaded.

Table 6
Component Matrix

	Challenges Faced by Regulatory Institutions	Component						
		1	2	3	4	5	6	7
1	Lack of comprehensive national OHS policy			.685				
2	Lack of effective supervision from regulatory institutions.	.462	.461					-.468
3	Lack of control measures to check the activities of construction companies.	-.333	.511		.332			
4	Improper documentation of accidents and incidents investigations.	.550	.396	.353				
5	Accident cases are not reported to the appropriate authorities.	.653						
6	Timeframe for reporting accidents or work-related illnesses to regulatory institutions is normally delayed.	.331			-.492	-.464		.372
7	Construction companies are unwilling to pay compensation to accident victims.	.623		-.334				
8	Outmoded documentation of accident cases. (Keeping accident records in Note Books).	.338			.625			
9	Lack of adequate resources to facilitate the implementation of health and safety regulations on construction project sites.	.438			-.402	.468		
10	Refusal of construction companies to register with regulatory institutions.	.641						
11	Inability to prosecute defaulting construction companies who fail to observe safety standards.	.657						
12	Health and safety stakeholders influencing activities on construction project sites.	.509						
13	Difficulties in monitoring the activities of construction projects due to lack of visibility of project sites.	.497	-.347		-.429			
14	Cost of organizing health and safety training and workshops.	.519	-.359					.344
15	Lack of logistics to organize sector-specific health and safety programmes.		-.520			.460		
16	Lack of cooperation of project team with health and safety regulatory agencies.	.496				-.359	.347	
17	Lack of a specific legal framework for regulating health and safety standards in the construction industry in Ghana.		-.424			.426	.614	
18	Extraction Method: Principal Component Analysis. a. 7 components extracted.							

7 components were extracted. Source; (Author's field Note 2015)

To present any possible loadings or reduce the number of cross-loading variables, the researcher subjected the seven factors to the *Varimax* rotation method to maximize the correlation between a factor and a variable. The results of the rotation are in Table 7. The table showed that the number of cross-loaded variables has been reduced to five (5); meaning, by rule, one has to delete them for easier interpretation.

Table 7
Rotated Component Matrix

	Challenges Faced by Regulatory Institutions	Component						
		1	2	3	4	5	6	7
1	Lack of comprehensive national OHS policy				.806			
2	Lack of effective supervision from regulatory institutions.	.815						
3	Lack of control measures to check the activities of construction companies.			-830				
4	Improper documentation of accidents and incidents investigations.	.590			.492			
5	Accident cases are not reported to the appropriate authorities.	.458					.432	
6	Timeframe for reporting accidents or work-related illnesses to regulatory institutions is normally delayed.						.851	
7	Construction companies are unwilling to pay compensation to accident victims.		.754					
8	Outmoded documentation of accident cases. (Keeping accident records in Note Books).				.538	.614		
9	Lack of adequate resources to facilitate the implementation of health and safety regulations on construction project sites.					.718		
10	Refusal of construction companies to register with regulatory institutions.		.479	.360				
11	Inability to prosecute defaulting construction companies who fail to observe safety standards.	.694						
12	Health and safety stakeholders influencing activities on construction project sites.		.819					
13	Difficulties in monitoring the activities of construction projects due to lack of visibility of project sites.			.558				
14	Cost of organizing health and safety training and workshops.			.623				
15	Lack of logistics to organize sector-specific health and safety programmes.							.605
16	Lack of cooperation of project team with health and safety regulatory agencies.					.563	.521	
17	Lack of a specific legal framework for regulating health and safety standards in the construction industry in Ghana.							.868

*Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization*

7 components were extracted. Source; (Author's field Note 2015)

Table 8 shows the seven factors to explain the reduced variables. From the table, the challenge, "Lack of comprehensive national OHS policy" has a high loading with factor 4. In other words, factor 4 explains the variable "Lack of comprehensive national OHS policy" better than any other factor in the model. Factor 1 explained variables 2 and 7. These account for the regulatory institutions' lack of effective supervision and inability to prosecute defaulting companies (Ineffective supervision) Factor 2 explained variables 5 and 8. These put together means, that construction companies are unwilling to pay compensation to accidents victim because it is health and safety stakeholders who influence them to do so. (Unpaid compensations). Factor three explained 3, 9 and 10. These groups mean the regulatory institutions lack effective

supervision and monitoring and do not organize health and safety training. (These stand for Lack of monitoring and supervision).

Factor 4 explained only variable 1 which is the Lack of comprehensive national OHS policy. Factor 5 explained only variable 6 which is “Lack of adequate resources to facilitate the implementation of health and safety regulation on construction project sites” (Inadequate resources). Factor 6 explains variable 4 “Timeframe for reporting accidents or work-related illnesses to regulatory institutions are normally delayed”, (Delay in reporting accident cases). Factor 7 explains variables 11 and 12 and hence can be grouped and renamed as “Lack of logistics to organize sector-specific health and safety programmes and Lack of specific legal framework for regulating health and safety standards (Lack of logistics and specific legal framework).

Table 8

Reduced Rotated Factors

	Challenges Faced by Regulatory Institutions	Component						
		1	2	3	4	5	6	7
1	Lack of comprehensive national OHS policy				.806			
2	Lack of effective supervision from regulatory institutions.	.815						
3	Lack of control measures to check the activities of construction companies.			-.830				
4	Timeframe for reporting accidents or work-related illnesses to regulatory institutions is normally delayed.						.851	
5	Construction companies are unwilling to pay compensation to accident victims		.754					
6	Lack of adequate resources to facilitate the implementation of health and safety regulations on construction project sites.					.713		
7	Inability to prosecute defaulting construction companies who fail to observe safety standards.	.694						
8	Health and safety stakeholders influencing activities on construction project sites.		.819					
9	Difficulties in monitoring the activities of construction projects due to lack of visibility of project sites.			.558				
10	Cost of organizing health and safety training and workshops.			.623				
11	Lack of logistics to organize sector-specific health and safety programmes.							.605
12	Lack of a specific legal framework for regulating health and safety standards in the construction industry in Ghana.							.868

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization

Source; (Author's field Note 2015)

In a word, the factor analysis has reduced to a few, the numerous challenges the regulatory institutions face in their effort to implement health and safety standards on project sites in Ghana. As a result, the key challenges have come into sharp focus. These are ineffective supervision; unpaid compensations; lack of monitoring and supervision; lack of comprehensive national OHS policy; inadequate resources; delay in reporting accident cases; and lack of logistics and specific legal framework. The following list sums up the key challenges:

- Lack of effective supervision and inability to prosecute defaulting companies who fail to observe safety standards
- Construction companies are unwilling to pay compensations to accident victims because it is the activities of health and safety stakeholders that are influencing them to do so;
- Regulatory institutions' effective supervision, monitoring and the high cost of organizing health and safety training;
- Lack of comprehensive national OHS policy;
- Lack of adequate resources to facilitate the implementation of health and safety regulations on construction project sites;
- Delay in reporting accidents or work-related illnesses to regulatory institutions;
- Lack of logistics to organize sector-specific health and safety programmes;
- Lack of a well-defined legal framework for regulating health and safety standards.

DISCUSSION

Challenges to Health and Safety Standards Implementation on Construction Site.: Perspectives of Regulatory Institutions

Regulatory institutions face numerous challenges when performing their functions. These challenges concern labour, the implementation and compliance with health and safety standards at construction sites and effective supervision by regulatory bodies. Quainoo (2001) noted that developing countries such as Ghana lack relevant policies to adequately cater for the health and safety of employees. The views of regulatory institutions corroborated Quainoo's (2001) findings that the lack of comprehensive national OHS policy was a major challenge to ensuring health and safety standards. Other points that regulatory institutions identified as challenges are the lack of a specific legal framework for regulating health and safety standards in the construction project sites in Ghana; the lack of logistics to organize sector-specific health and safety programmes; and the use of outmoded methods for documenting accidents (Researchers Field Note – refer to 2.4.). Many agreed to the use of modern methods for documenting accidents, such as computerizing for easy reference and retrieval.

It's high time we move away from this act of notebook record keeping. Fire consumes very important national documents when there is a fire outbreak. The internet has come to stay. All regulatory institutions need to use it.

Those regulatory institutions who make effective use of this modern method of record-keeping suggested that there was no need to always wait for Government to provide them with computers. That they could plan to set aside some money generated internally to acquire these devices.

The regulatory institutions added the following to the list of challenges to their successful implementation of safety rules and regulations. They include the inability of authorities to prosecute construction companies who default in observing safety standards, ineffective supervision by regulatory institutions; difficulties in monitoring the activities of construction projects due to distance; and the high cost of organizing health and safety training and workshops. One interviewee stated that monitoring construction activities are a very tedious task, which demands labour and logistics. The cost of monitoring construction activities in Ghana is one of the challenges in implementing health and safety standards for most regulatory

institutions. If the government is the financier of a project, monitoring and supervision are poor due to the late release of funds. One interviewee said:

All these aforementioned problems are relative; thus, it depends on the funding agency. Its donors are funding there is money for monitoring and supervising the project; of organizing the health and safety; but if the government is the funding agency it may happen that at that material moment fund was not available hence there would be difficulties faced in monitoring the project.

The refusal of construction companies to register with regulatory institutions is yet another challenge, as noted in the researcher's Field Note (refer to 2.4). Registration with regulatory institutions for a permit to work enables the former to track the activities ongoing on sites. The National Building Regulations (1996) L.I. 1630, stated emphatically that construction companies require a permit from the District Planning Authority when they intend to erect any building, make any structural alteration to any building, or execute any works or install any fittings in connection with a building. Some construction companies comply with this directive, but others bluntly refuse.

Registration with my institution gives me a fair idea of the activities, locations, accessibility and environmental hazards they pose to the good people of this nation. Hence, even small shops must register with us. The only remedy for total failure to register with us after much education is to seek intervention from the court of law.

Other challenges of regulatory institutions are improper documentation and inconclusive investigation of accidents; inadequate resources to facilitate the implementation of health and safety regulations on construction project sites; delay in reporting accidents and work-related illnesses to appropriate institutions. Delay in reporting accident cases to the appropriate institution for action is not exclusive to Ghanaian firms. A study by the British Safety Council (2009) found that reporting both work-related accidents and ill health to the right institutions for action is poor across the world.

Some other challenges of regulatory institutions are lack of cooperation between the project team and health and safety regulatory agencies; construction companies' unwillingness to pay compensations to accident victims; and the dearth of commitment by Health and Safety stakeholders influencing the activities of construction companies. These findings are consistent with researchers' Field Note, which noted that reporting an accident is a secondary matter to construction companies. Indeed, regulatory bodies need to enforce the laws to prosecute intransigent firms.

Factor analysis was used to trim down challenges regulatory institutions face to a few key challenges. These factors are ineffective supervision and monitoring; the inability to prosecute companies who fail to observe safety standards; construction companies' unwillingness to pay compensation to accident victims; and the high cost of organizing health and safety training. Others are a lack of comprehensive national OHS policy; inadequate resources for implementing health and safety regulations on construction project sites; delays in reporting accidents or work-related illnesses to regulatory institutions; lack of logistics to organize sector-specific health and safety programmes; and lack of specific legal framework for regulating health and safety standards.

In summary, these challenges are ineffective supervision; non-payment of compensations; lack of monitoring and supervision; lack of comprehensive national OHS policy; inadequate

resources; delay in reporting accident cases; lack of logistics; and specific legal framework for prosecuting cases.

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

Summary of Findings

The objective was to identify key challenges faced by regulatory institutions in the implementation of health and safety standards on project sites in Ghana. The study isolated the following specific challenges.

- Lack of effective supervision;
- Inability to prosecute companies who fail to observe safety standards;
- Construction companies are unwilling to pay compensation to accident victims;
- Ineffective supervision and monitoring;
- High cost of organizing health and safety training;
- Lack of comprehensive national OHS policy;
- Lack of adequate resources to facilitate the implementation of health and safety regulations on construction project sites;
- Delays in reporting accidents or work-related illness to regulatory institutions;
- Lack of logistics to organize sector-specific health and safety programmes;
- Lack of a specific legal framework for regulating health and safety standards.

Conclusions

Regulatory institutions in the effectuation of their functions faced this challenge: lack of a specific legal framework to enforce laws, inadequate labour, meagre funding, limited resource and logistics; non-compliance and non-collaboration from construction firms. Regardless of these challenges, construction companies and regulators have been able to ensure health and safety standards in construction firms. Employees' effective use of Personal Protective Equipment (PPEs) on project sites and their receipt of training and education on health and safety practices at construction sites resulted in the development of a positive attitude towards health and safety. Compliance with safety regulations, maintenance of tools and machinery, and the use of effective communication skills to promote health and safety standards in project sites by employees are other contributors.

The study contributed to knowledge since the questionnaires developed could be adopted by any researcher all over the world for further studies concerning the subject matter. In addition, the study is an improvement in literature.

Recommendations for Government

- The government in consultation with various stakeholders in the health, employment and construction industry should revise and enforce health and safety regulations;
- Government must give regulatory institutions much legal backing to ensure companies meet their requirements at construction sites;
- Government should give regulatory institutions the power to sanction obdurate companies;
- Government should adequately resource regulatory institutions to effectively carry out their mandate;
- Government should oversee those regulatory institutions as stipulated by the law;
- Government, in corroboration with contractors and regulatory institutions, should introduce a National Contractor Award Scheme to create competition among

construction companies and to improve voluntary compliance with occupational H&S regulations.

Recommendation for Regulatory Bodies

- Regulatory bodies must enforce health and safety standard rules and regulations without fear or favour to deter recalcitrant companies;
- Regulatory bodies must resource their outfit adequately and build their staff capacity in the area of health and safety to effectively monitor and supervise construction firms to ascertain their level of implementation of health and safety standards;
- Regulatory bodies should put in place mechanisms to internally generate funds for the acquisition of devices for comprehensive record keeping;
- Regulatory institutions could devise motivational packages to stimulate construction companies for enhanced performance;
- Regulatory bodies should sanction mediocre performing staff to stimulate improved performance;
- Regulatory bodies must collaborate with construction firms in the area of training and education of employees on health and safety standard practices.

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