

## **Occupational Health Hazards among Construction Workers in Gaborone, Botswana**

Article by Joseph Emuron  
*Estate Construction (Pty) Ltd, Gaborone, Botswana*  
Email: [emuronj@yahoo.com](mailto:emuronj@yahoo.com)

### ***Abstract***

*The purpose of this study was to identify and highlight the hazards that are most commonly found at construction sites in Botswana. Respondents from Estate Construction Company located in Gaborone was selected for this study. Questionnaire survey was conducted on the construction site to establish the health and safety hazards prevailing and control measures therein. A physical observation was also conducted on the construction sites in order to relate questionnaire responses to what actually obtains on the construction site.*

*In Botswana, the construction industry is booming as economic development takes its course. However, much as construction has come with its benefits, records of the factories inspectorate of the department of labour reveal that between 2000 and 2003, five fatalities were recorded in Botswana's construction industry. Even though the number of these accidents is not alarming, the benefits paid to the accidents victims are high. These accidents represent a considerable economic and social burden to employers, employees and to the society as a whole. This therefore calls for urgency in mitigating this problem. This study will help come up with comprehensive measures to rectify this problem such; identifying the hazard, assessing the risk and controlling the risk to ensure a safe and conducive working condition for the workers. Implementation of control measures requires different approaches due to changing working environment at the construction sites.*

**Keywords:** *Construction, Hazards, Safety, Workers, Booming, Industry.*

### **Introduction**

The global volume of construction output is forecast to grow by 85% to \$15.5 trillion by 2030, according to PricewaterhouseCoopers, with the largest construction markets -- the US, India, and China -- accounting for 57% of global growth. Other key markets include Japan, Germany, Spain, France, and Italy. Emerging markets such as India is growing quickly as a result of increased urbanization, rising populations, and the expanding middle class. Construction growth in China is expected to slow in some sectors such as housing and shift to health care, education, social infrastructure, and retail. Construction in some mature economies has been constrained by government deficits and austerity measures. The US construction industry includes about 660,000 establishments (single-location companies and units of multi-location companies) with combined annual revenue of about \$1.5 trillion (First Research Industry Profiles; Fort Mill, South Carolina).

Over the last two decades, the construction industry has grown tremendously hence becoming one of the main engines of growth and development in many economies as shown by statistics above. It has provided infrastructure that other sectors of the economy rely on to produce goods and services as well as housing which is a basic human need. Other opportunities that come with it are: employment opportunities and communication networks. However, despite its importance, it's littered with a lot of hazards and presents itself as one of the riskiest sectors to work with especially where rules and regulations are not fully implemented. Potential hazards for employees in the construction sector include: scaffold collapse, trips, slips, failure to use proper personal protective equipment, falls from height, collapse of trenches, noise, repetitive motion injuries caused by vibrating tools, falls, electric shocks and

arc flash blasts and everyday and this makes them have the potential for becoming sick, ill or disabled for life. The above scenario can be managed by ensuring rules and regulations are fully implemented, there is adequate supervision, training of workers and other hierarchy of control measures. However, there is no single best approach to the management of hazards in the construction sector but it should involve all stakeholders. In that way, all their interests will be considered.

And evidence shows that a well-considered policy contributes to business efficiency and continual improvement throughout the organization. It helps to minimize financial losses arising from avoidable accidents and demonstrates to the workforce that accidents are not necessarily the fault of any individual member of the workforce. A good health and safety policy helps to ensure that there is a systematic approach to risk assessment and sufficient resources, in terms of people and money, have been allocated to protect health and safety and welfare of the workforce (Phil Hughes 1995-2001). This elucidates the fact that having a quality policy in place can help in addressing the challenges arising in the construction.

## **Methods**

### **Description of the study site**

Estate construction Pty Ltd is a construction company fully incorporated under the laws of Botswana. It has been offering construction services over the last ten years and employing about five hundred workers spread all over the country. The sites are located in the following areas: Central business district (CBD), Glenn valley, Kanye, Mathathane, Thumi and Platjane with the head office being in Block 3 in Gaborone. It employs workers with a wide range of skills including: electricians, plumbers, bricklayers, steel workers, carpenters, scaffolders, SHE officers, etc. Since its inception, it has been involved in bush clearing, construction of roads, bridges, bus and taxi ranks. The management structure is hierarchical in nature: Managing director at the top, followed by the Project manager and other staff members.

### **Data collection method**

#### **Research**

The qualitative method of research in this study aimed at determining the health and safety hazards and reliability of the control measures. The survey instrument needed to be designed so as to capture people's actions and perceptions. It also needed to be designed to enable an understanding of the practices in organizations relative to the study of health and safety hazards. Because of the type of data that was obtained, it was found that interviews with workers on construction site, coupled with a physical observation, constituted the best method.

A pilot study was conducted by the selection of a small sample of workers covering all the trades in the organization (n=6) who gave their opinions so as to improve the questionnaire. The data which was collected during the pilot study was not considered in data analysis.

Questionnaires were developed and delivered to building construction sites and respondents were requested to complete them after the researcher introduced himself. Checklists were also used to collect information obtained from observations. Lists of behaviors, artifacts, or elements were recorded on the checklists to validate the authenticity of the questionnaire responses, to check if the items were found to, be present, exhibited or true. This methodology was adopted to optimize the reliability of the findings in terms of reconciling physical observations with those emanating from the respondents.

The selection of the sample stratum was based on time and financial limitations.

Given that there were five six branches scattered within and outside Gaborone and under the same management at the time of the study, one building site located in Central Business District with total number of seventy (70) employees was selected and 35 questionnaires were distributed and completed and included in the analysis of the data.

## **Reliability and validity of data collection instrument**

### **Reliability**

The findings from the study may have a certain level of reliability but certainly not as quantitative research because there's an element of subjectivity. The interpretation will solely depend on the researchers own judgment but the researcher tried as much as possible to adhere to the principles of research by exercising personal discipline to avoid excessive subjectivity and as well as adopting a 'disciplined subjectivity' (Kathryn M. Borman and Margaret D. Lecompe). Reliability was also possible by use of checklists to validate the authenticity of the questionnaire responses, to check if the items were found to be present, exhibited or true.

### **Validity**

The researcher tried as much as possible to make sure the findings of the study are universally accepted by validating the questionnaire. It is believed that a validated questionnaire ensures that the research measures what it is meant to measure right from data collection, techniques, sampling of the study population.

### **Data analysis method**

The process of data collection was followed by data processing which basically was to make collected data more organized, meaningful and easier for analysis and interpretation. The researcher used content analysis and a scheme of analysis was worked out following the coding categories using quotations and identifying literature to be used in the synthesis of the findings.

### **Ethical approval**

Approval was obtained from the project manager of the company before the commencement of the study.

### **Limitation of the study**

The study was limited in scope because of time and financial constraints.

## **Results**

The demographic characteristics of the workers are as follows: Out of 35 respondents sampled, 10 were women and 25 men, the greatest proportion were aged 19-28 years and had 1-3 years' experience. More than half of them were skilled implying most of the workforce was competent. Less than half of them were married.

With respect to the general perception of risks presented by the hazards, 23 out of 35 respondents perceived their job as risky. But this proportion varied slightly according to the profession; the perception of risk was highest among scaffolders due to the risk of falls and lowest among painters.

The availability of first-aid tools, instructions and a trained specialist at the construction site is a safety requirement according to labour laws of Botswana. Of the surveyed respondents, 13 out of 35 were aware of the availability of first-aid materials at their construction site whereas 22 said were aware, implying that the level of awareness is high. When asked if there are trained specialists at the construction site, than half of the respondents said they are not there.

Of the respondents, 32 indicated that their main perceived risk was the risk of accidents while only 3 reported their main risk was occupational disease. This is borne out by workers' actual experiences; 20 of respondents reported having ever experienced any work accidents in their lifetime but only 15 reported suffering from a work-related disease. The main cause of the accidents according the subgroup that had experienced them was carelessness, followed by lack of safety measures and stress due to excessive overtime hours.

When asked about as to whether there is a safety culture in place, half of them answered in affirmative. When asked whether there are effective strategies to promote a safety culture, workers reported that safety training and education 21 and communication 11 would be the most effective, rather than inspection and enforcement 3. However, these strategies were not widely employed in reality, with only 16 of the workers reported having received any safety training, although almost all of them mentioned occasional or frequent promotion of safety during work by their supervisors.

Findings from observations on the construction site lead to the conclusion that hazards exist and the control measures are not effectively in place. Observations indicated that, less than half of the workers were wearing hats. Five of the workers observed were not wearing eye protection while working with power tools and two of the workers were not wearing the requisite gloves while carrying sharp tools or materials. Scaffolding without guardrails or toe boards was also observed but fortunately, all scaffolding was having guardrails. These observations provided an indication of the level of vulnerability or protection of employees at the site.

The kind of hazards can also be gauged based upon the audits and inspections that are conducted by contractors, clients, and designers. When asked whether the management conducts regular inspections, about 14 of the respondents said that their management conducted inspections. This shows that much as inspections take place, more needs to be in that sector because less than half agree that there is regular inspection.

Similarly, the purpose for the conducting of audits and inspections is to observe and record risk-taking behavior on construction sites, and to use it to mitigate or prevent future occurrences. However, only 10 of the respondents stated that their organizations observed and recorded risk-taking behavior on construction sites. This further reinforces the conclusion that hazards present are a high risk to the workers. Essentially, endeavors to prevent accidents, incidents, and occupational diseases are not taken.

Another finding from observation indicated that workers operate vibrating equipments. When asked for how, 5 out of 9 who operate such machines said for a maximum of five hours in a day. They also said they have work breaks as one way of addressing the negative effects of hand arm vibration. This is a good move considering the negative consequences associated with hand arm vibration

The other aspect concerns noise produced by the drilling machine. The researcher experienced sporadic noise but which can have a negative effect on the hearing ability of a person when exposed long term but all employees were going about their work normally as if all is normal without any kind of protection. When a question was subjected to them as to whether they have any problem with excessive noise levels, 30 out of 35 respondents said it was okay for them meaning they do not see it as a hazard. Implying that although there no control measures to address the risk, they did not care much whether they are provided with protection or not.

Workers were also asked how long they take working on a normal working day. The responses were varying alluding to the fact that they have different contracts. 15 of the respondents said they work for more than eight hours a day and it's not even considered 'overtime'. 9 said work till 5pm. whereas others come to do a particular assignment and leave at the end of it. This particular activity could not be collated using physical observation because there is a lot of movement of people in and out. However, one particular factor is clear, some workers psychological stress resulting from working long hours. It's something the top management has to address otherwise it remains a scar in the lives of the workers.

Another area the researcher was interested in was on electric shocks. Respondents were asked if they have ever experienced electrocutions, electric shocks and other accidents related to working with electricity. All those working with electrical installations who were interviewed representing 6 respondents out of 7 said such cases are very rare because they are provided with adequate protection, sufficient training that has helped mitigate some of the complications related to electricity. This therefore became apparent that the management of the construction company has addressed that aspect properly.

Another observation happened in the area of ergonomics to determine if there any hazards related to it. When asked such that question, more than half of the respondents said they do not have any issues

concerning ergonomics and that the principles are adhered to by the management. This means the management has put in place all the requirements meant to ensure there is fit between the worker and the tools/equipment. It was an area found it challenging to establish using observation.

The implementation of health and safety control measures entails implementing the requirements of legislation, namely standards as well as systems, procedures, and protocol. A total of 15 of the respondents indicated that their organization was registered with the department of labor, and 20 of the respondents were unsure. This response can possibly be attributed to the fact that the respondents were most of the time based on sites and some of them probably did not have access to information at top-management level. However, legislation requires that a copy of the registration certificate be retained in a file on site. The 20 of respondents that were not sure could then be considered to not have registered with the department of labor. Otherwise, respondents genuinely were to a great extent sure of the status of their organizations' registration.

## **Discussion**

Workers' perceptions about safety is an important element in promoting a safe working environment, as it contributes to the safety situation and allows the workers' point of view to be considered in formulating workers' safety policies in the construction sector. In general, this study suggests that the extent to which hazards pose a serious danger at workplaces in Botswana existed. However construction workers did show positive perceptions toward risks and safety.

A great majority of workers interviewed perceived their job as risky and some reported that their work sites did not have safety tools. Just less than half of respondents reported suffering from a work-related disease. The incidence of construction-related diseases was reported by our workers as fairly low and almost nonexistent. This may be due to the simple type and typically small size of projects compared with other countries.

The greatest influence on safety according to workers' perceptions was the foreman whose role generally requires a greater degree of experience and higher level of education than for other workers. The foreman has the most frequent contact with workers at the construction site, assigning tasks and monitoring performance, checking hazards, risks and is the person specifying the ways in which the work is to be performed and skilled enough to identify unsafe situations.

Accidents and ill health may be a result of technical and/or managerial failing. Workers reported that the main causes of accidents were carelessness by workers, absence or inadequate safety measures for a particular task and stress due to excessive overtime work. However, weak implementation of the government safety laws could be the root cause as this enables violations (e.g. not securing safety tools and forcing excessive overtime) to occur without punishment. The perceived inadequate training and education was another perceived cause of accidents according to workers. Other studies showed that accidents in the construction industry occur due to 3 root causes: failure to identify unsafe conditions before the activity, decision to proceed despite the identification of unsafe conditions and decision to work regardless the conditions of the work environment. Some of our workers identified inadequate tools and a very few suggested use of equipment beyond its capacity as causes of accidents.

Safety training and education were believed by our workers to be the elements with the greatest impact on construction site safety. This agrees with Dingsdag et al., who found that occupation health and safety training and education is the most important element for safe performance. Communication with the workers was identified by our sample as the second key element essential to improving worksite safety. Good communication enables effective feedback about the safety of the workplace and workers' concerns, which can contribute to improved safety situations

Literature informs that the existence of health and safety hazards and control measures can be established by determining the organizational culture. This is seen through both workers' and managements' actions. Appropriate actions or behavior will be exhibited if workers and management have knowledge of health and safety hazards, risks and control measures.

Organizations need to address the aspect of worker safety with the urgency it deserves because neglecting it can result into negative consequences. However, the physical observations indicate that health and safety standards are not pathetic after all over and above.

Literature also informs that management systems, procedures, and protocol are essential to the implementation of health and safety. The findings indicate that there is a management system, procedures, and protocol in the construction industry though not up to the highest standard. Hazard identification and risk assessment, prior planning, and record keeping were found to be adequate.

Safety training and education were believed by our workers to be the elements with the greatest impact on construction site safety. Occupation health and safety training and education is the most important element for safe performance. Communication with the workers was identified by our sample as the second key element essential to improving worksite safety. Good communication enables effective feedback about the safety of the workplace and workers' concerns, which can contribute to improved safety situations (Al Sari et al)

## **Conclusions**

Relative to the level of health and safety awareness and implementation in Botswana's construction industry, it can be concluded that; the level of health and safety management in construction sites is relatively good; though improvements need to be undertaken in such areas as enforcement of legislation and application of hierarchy of risk controls.

The findings from the survey cannot be generalized to be representative of the situation throughout the country because it was conducted in just one Construction Company and due to its qualitative nature; the findings were opinions of the workers.

## **Recommendations**

There should be awareness creation to the owners of construction companies to improve standards; health and safety management systems should be in place; there should be adequate implementation of health and safety regulations; workers need to be educated on risk taking behavior and health and safety procedures and protocols need to be put in place. Regular inspections are necessary and it should involve all stakeholders.

## **References**

- [1].Al Sari, M. I; Al Khatib, I. A. Eastern Mediterranean Health Journal; Alexandria 18.10 (2012): 1028-33
- [2].Coble, R.J. and Haupt, T.C. (1999), "Construction safety in developing countries", in Singh, A., Hinze, J.H. and Coble, R.J. (Eds), Implementation of Safety and Health on Construction Sites, A.A. Balkema, Rotterdam.
- [3].Gould, F.E. and Joyce, N.E. (2002), Construction Management - Professional Edition, Prentice-Hall, London.
- [4].Health and safety (H&S) awareness and implementation in Botswana's construction industry. Musonda, Innocent; Smallwood, John. Journal of Engineering, Design and Technology; Bingley 6.1 (2008): 81-90. Kathryn M. Borman and Margaret D. Lecompte.
- [5].UK Government: Addressing major causes of fatalities remains HSE Construction Division's priority in 2003/04, M2 Presswire; Coventry [Coventry] 24 Apr 2003: 1.
- [6].<https://www.britsafe.org/media/1570/the-causes-incidence-occupational-accidents-ill-health-across-globe-report.pdf>
- [7].[http://www.researchsystem.siam.edu/images/independent/Consumer\\_acceptance\\_of\\_air\\_purifier\\_products\\_in\\_China/CHAPTER\\_3.pdf](http://www.researchsystem.siam.edu/images/independent/Consumer_acceptance_of_air_purifier_products_in_China/CHAPTER_3.pdf)