Question, The impact of safety in construction project

Introduction

According to International Labor Organization (ILO), 337 million occupational accidents occur worldwide in every year and as a result of these accidents 2 million and 310 thousand people decease and 160 million people get injured. The financial loss caused by occupational accidents is estimated as 1.2 trillion $. There is an economic burden such as social security system and treatment costs on the back of society due to occupational accidents and diseases. Occupational accidents cause important financial loss in workplaces. However, occupational statistics are not recorded sufficiently in the developing countries and thus, the real cost of occupational accidents cannot be calculated. The heavy costs that the companies must face, prove the importance of occupational safety measurements (Andreoni, 1986; Larsson and Betts, 1996; ILO, 2004; Rikhardsson and Impgaard, 2004; Hamalainen, Takkala and Saarela, 2006).

Construction industry is an important part of the economy in many countries and often seen as a driver of economic growth especially in developing countries. Typically, construction industry contributes to 11% of gross domestic products (GDP) in most developing countries (Giang and Pheng, 2010). However many construction activities are inherently health and safety risks such as working at height, working underground, working in confined spaces and close proximity to falling materials, handling load manually, handling hazardous substances, noises, dusts, using plant and equipment, fire, exposure to live cables, poor housekeeping and ergonomics. In an urban context, health and safety accidents are relatively higher due to the fact that high rise buildings remain predominant with the fast-growing complexities of domain-wide construction projects to cope with modernizing cities arena and high demand for housing, offices, services and other infrastructures due to the high urbanization. Despite its importance, therefore, construction industry is considered as being risky with frequent and high accidents rate and ill-health problems to workers, practitioners and end user

Health and safety therefore is an economic as well as humanitarian concern that requires proper management control. One of the most common myths that have plagued this industry is that health & safety comes at a cost. Construction managers tend to believe that introducing and executing measures that ensure health and safety in construction sector will lead to higher cost, and hence lower profitability. However, it has been proved that investment in construction health and safety actually increases the profitability by increasing productivity rates, boosting employee morale and decreasing attrition (Mohammed, 2003).

Construction safety and health management therefore deals with actions that managers at all levels can take to create an organizational setting in which workers will be trained and motivated to perform safe and productive construction work. The system should delineate responsibilities and accountabilities. It should also outline procedures for eliminating hazards and identifying potential hazards before they become the contributing factors to unfortunate accidents.

2. Methodology

- The study used both survey and descriptive designs. The survey technique was significant in gathering information from site supervisors and the workers on the construction sites by use of questionnaires and/or interviews. Descriptive research was used for this study since it helped to identify the nature of the health and safety measures used on the construction sites and evaluate their enforcement mechanisms on construction sites as practiced in Kenya - Interviews were used as one of the sources of collecting primary data. The interviews were held with site personnel, including site agents, clerks of works and both skilled and unskilled workers to assist in explaining and clarifying any information required - Questionnaires were used as the main source of data collection. They were administered to the site management/supervisory staff and the construction workers both skilled and unskilled. The questionnaires were self-administered whereby they were hand delivered to the respondents to complete the questionnaires themselves. - Direct observation was also used which involved guided work site visits to construction sites were performed to directly observe and document the identified hazards, tasks, job site organization, work practices, equipment and tools being used.

Health and Safety in the Work Place

Occupational health and safety has been defined by the International Labor Organization (ILO), 2001 as: “The prevention and maintenance of the highest degree of physical, mental and social well-being, the prevention of ill-health among workers caused by their working conditions, The protection of workers from factors adverse to their health in their employment, and the placing and maintaining workers in occupational environments adapted to their individual and psychological conditions.” Health refers to the protection of bodies and minds of people from illness resulting from materials, processes or proceeding used in the work place whereas safety is protection of people from physical injury (Hughes and Ferret, 2008). Safety means a state in which no danger of a damage causing accident exists. A high

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Level of occupational health and safety contributes to the achievement of material and economic objectives and provides high quality and performance in working life. In spite of this, conditions at work and in the work environment for many occupations and in many countries still involve a distinct and even severe hazard to health that reduces the well-being, working capacity and even the life span of working individuals.

Construction Industry Health and Safety Construction workplaces the workers are exposed to hazards of occupational diseases and injuries and the adverse effects of excessively long hours of work. Machines, plants and other sophisticated construction equipment pose danger to the operators, who in most cases do not have prior skills for operating such machines or plants. A worker should be assigned duties in relation to his physical and mental health and skills. Further, employers should have complete control over their employees and therefore ensure adherence to safety practices. The company must comply with all provisions of safety and health regulations that pertain to the construction works itself.

A number of factors having a negative impact on health and safety management in developing countries which include poor infrastructure; problems of communication due to low literacy level; unregulated practices on construction sites; adherence to traditional methods of working; non availability of equipment; extreme weather conditions; improper use of equipment and corruption. The culture of the construction industry in developing countries also does not promote health and safety. The practices of competitive tendering and award of most public contracts to the lowest bidder in many developing countries compels contractors to drive their prices low while cutting costs which in turn affects health and safety.

3.2: Health and Safety Measures in Construction

3.2.1 Site Layout and planning a badly planned and untidy site is the underlying cause of many accidents. This results from falls of material and collisions between workers and plant or equipment. Space constraints, particularly in urban work sites, are nearly always the biggest limiting factor and a layout which caters best for the safety and health of workers may appear to be difficult to reconcile with productivity. Proper planning by management is an essential part of preparation and budgeting for the safe and efficient running of a construction operation. There

are many accidents due to tripping, slipping or falling over materials and equipment which have been left lying around, and stepping on nails which have been left projecting from timber

PPE program should be implemented. This program should address the hazards present; the selection, maintenance, and use of PPE; the training of employees; and monitoring of the program to ensure its ongoing effectiveness. The PPE required in the construction sites include; eye protection and face protection, hearing protection, respiratory protection, hand and arm protection, foot and leg protection, head protection and body and fall protection mechanisms

During this survey it was observed that construction workers on the sites lacked appropriate protective equipment for instance workers were noted carrying out high risk activities such as painting, excavations, concreting among others without the right protective gear such as helmets, masks, ear muffs, goggles and overalls.

First aid Kits and Accident Reporting Construction sites are dangerous places, and first aid and rescue equipment should always be available. What is needed depends on the size of the site and the numbers employed, but there should be a blanket and a stretcher. On large sites with more than 200 people are employed, there should be a properly equipped first aid room. On any construction site of that size, at least one person on every shift should have been trained in first aid to a nationally recognized standard. On day -to-day works procedures, an accident register book should be kept at the site, in which all types of minor injury such as bruises, to major accidents like imputing disability and fatal should be recorded.

This survey established that the construction sites that had first aid boxes were ill equipped with only spirit, bandage and cotton wool. Again the requirement that at least one person on every shift should be trained in first aid to a nationally recognized standard was not met since no respondent indicated having been trained as a first aider. First aid is a life saving exercise which is taken for granted on the sites visited and shows that workers are exposed to danger and risks when injured. Considering that accidents are rampant in construction sites as respondents indicated having witnessed some sort of accident first aid facilities is necessary.

3.2.4: Health and Safety Warning Signs

Safety Signs and Signals are one of the main means of communicating health and safety information. This includes the use of illuminated signs, hand and acoustic signals (e.g. fire alarms), spoken communication and the marking of pipework containing dangerous substances. Traditional signboards, such as prohibition and warning signs, signs for fire exits, fire action plan notices (fire drills) and fire-fighting equipment are also considered to be Safety Signs. It is critical that all Safety Signs and Signals can be easily understood. Where signboards are used in a workplace they should be sufficiently large and clear so that they can be easily seen and understood. Signboards also need to be durable, securely fastened and properly maintained to ensure they remain visible. Care must be taken to avoid using too many signboards in close proximity, signboards are only effective if they can be seen and understood. If too many signs are placed together there is a danger of confusion or of important information being overlooked (HSE 2009).

safety plan should be placed into a training program that's needed to be participated in by every site worker previous to partaking in any job found on the positioning irrespective of the roles simplicity. The absence of site meetings as established in this survey implies that workers are not given a forum learn about various risks on the sites and supervisors equally do not have opportunities to communicate important health and safety matters to the workers. Site meetings are one of the ways of sensitizing workers on their health and safety in the site and should therefore be held frequently.

Health and safety risk assessment

Health and safety risk assessment in a construction site is an important measure towards reduction of hazards and injuries. In the context of health and safety, common definitions used for risk are that: risk is the likelihood of a substance to cause harm; and risk is a combination of the likelihood of an occurrence of a hazardous event or exposure(s) and the severity of injury or ill health that can be caused by the event or exposure. According to HSE (2004), employers are required to make an assessment of the health and safety risks to which employees and others are exposed on construction sites. The significant findings must be recorded where five of more people are employed. Since managing health and safety is different from managing any other aspect in construction there need to do a risk assessment to find out about the risks, and to put sensible measures in place to control them, and make sure they stay controlled.

3.2:7: Health and Safety Training in Construction Sites With regard to Occupational Safety and Health, training consist of instruction in hazard recognition and control measures, learning safe work practices and proper use of personal protective equipment, and acquiring knowledge of emergency procedures and preventive actions. Training also provide workers with ways to obtain added information about potential hazards and their control; they could gain skills to assume a more active role in implementing hazard control programs or to effect organizational changes that would enhance worksite protection.

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Employees must therefore be given health and safety induction training when they start work, which should cover basics such as first aid and fire safety. There should also be job specific health and safety training. Training must also be provided if risks change, and refresher training when skills are not frequently used.

This study established that the training and induction carried out in construction sites is inadequate and hence there is need to review the same and probably implement a training program on health and safety since it is required that all employees must be given health and safety induction training when they start work, if risks change, and refresher training when skills are not frequently used.

3.2:8: Working Environment

According to ILO (1999), chemical Substances are a major health hazards since there are many chemicals used in the construction industry, which include insecticides, adhesives, cleaning agents, wood preservatives, fungicides, and paints among others. Many of these chemicals are hazardous, with a potential to cause poisoning. Toxic substances can cause both acute and chronic effects resulting from exposure for a long period. Dusts from many sources are also a prominent hazard in construction. Silica and asbestos dust can permanently damage the lung tissue, whilst lead in dust is absorbed into lungs and enters the blood stream causing

poisoning. Cement mixes is also a well-known cause of skin disease. Lead is found in electricity cables, pipes gutters and lead sheet roofs. Excessive lead absorption causes constipation, abdominal pain, anemia, weak muscles and kidney failure

3.2.9: Welfare Facilities

Work in the construction industry is tough and involves much manual or physical activity. It is also hazardous and dirty and therefore good welfare facilities not only improve workers' welfare but also enhance efficiency. Welfare facilities such as the provision of drinking-water, washing, sanitary and changing accommodation, rest-rooms and shelter, facilities for preparing and eating meals, temporary housing, assistance in transport from place of residence to the work site and back, all help to reduce fatigue and improve workers' health.

Therefore health and safety measures employed on construction sites are inadequate and fail to meet the required standards. The culture and attitude of construction workers and the site supervisors about health and safety often condone risk taking and unsafe work practices. Lack of proper information and ignorance are also to blame for the poor safety measures in construction sites. For instance some workers felt that the safety equipment's such as hard helmets and reinforced boots are too cumbersome and uncomfortable.

4. Legislation and Enforcement of Health and Safety Regulations

Cotton et al., (2005) noted that the institutional and legal governance frameworks on occupational health and safety in developing countries have little impact. The majority of contractors are small and medium Enterprises operating within their domestic markets where enforcement of health and safety standards and labour standards is very lax. Enforcement of health and safety regulations remains a problem due to lack of adequate resources available to government institutions

responsible for occupational health and safety administration. Also, there remains an acute need for contract provisions to support the enforcement of labour laws in developing countries.

4.1: The Occupational Safety and Health Act of 2007

In Kenya the health, safety and welfare of workers is the Occupational Health and Safety Act (OSHA) which was enacted in 2007. This Act was enacted to provide for the safety, health and welfare of workers and all persons lawfully present at workplaces, and also to provide for the establishment of the National Council for Occupational Safety and Health and for connected purposes. The purpose of this Act is to secure the safety, health and welfare of persons at work; and to protect persons other than persons at work against risks to safety and health arising out of, or in connection with, the activities of persons at work.

This Act applies to all workplaces where any person is at work, whether temporarily or permanently. Therefore the act and its provisions apply to the construction industry since the construction site is regarded as a factory. The Act provides for duties of both employer/occupier and the employees in ensuring the safety, health and welfare at work.

4.1.1: Health and Safety committee- The Act requires every occupier to establish a safety and health committee at the workplace in accordance with regulations prescribed by the Minister if there are twenty or more persons employed at the workplace; or the Director directs the establishment of such a committee at any other workplace

4.1.2: Health and Safety Audit- the Act in Section 11 requires the occupier of a workplace to cause a thorough safety and health audit of his workplace to be carried out at least once in every period of twelve months by a safety and health advisor, and a copy thereof sent to the Director.

5. **Enforcement Mechanisms of Health and Safety Regulations**

Enforcement mechanisms are part of health and safety management.

An organizational framework must be set up to facilitate the implementation of the policy. A structure that clearly defines the duties and responsibilities of the

various levels as far as safety is concerned must be designed. It should ensure that safety is integrated rather than separated from production thereby facilitating total commitment to safety. Health and Safety organization on a site includes the following: Safety officer, supervisor / Foreman, worker, safety Committee,

safety Representatives and Government representative. In Kenya Occupational, Health and Safety Act (OSHA) provides for the legislation and the enforcement mechanisms on health and safety matters in the construction industry. The health and safety officers are required to inspect the sites to ensure that the provisions of this Act are adhered to by all parties.

This study established that personal protective equipment provided is rarely inspected and this means that construction workers work without anyone confirming that they are in the right protective gear. Given that most of the workers do not have the requisite health and safety training it is possible that they are unaware of the role of personal protective equipment hence inspection for the same is important to ensure compliance and proper use. Also despite the importance of site layout planning the low percentage indicates that health and safety issues are rarely considered when planning.

OSHA (2007) requires every occupier to establish a safety and health committee at the workplace in accordance with regulations prescribed by the Minister if there are twenty or more persons employed at the workplace. However the study established that health and safety committees on construction sites is a key aspect in enforcement of health and safety but as established in this study the same are not constituted in most construction sites. Further factory inspections as required by the Occupational Health and Safety Act (2007) are hardly carried out implying that enforcement is inadequate. This is further exemplified by the indication that only one of the respondents had been penalized for failure to observe health and safety regulations. This shows that enforcement mechanisms of health and safety in construction sites are not adequate.

Health and safety audits on construction sites are key aspect in enforcing health and safety measures, however a high percentage indicated that they do not carry out audits. This contravenes the law since the Occupational Health and safety Act in Section 11 requires the occupier of a workplace to cause a thorough safety and health audit of his workplace to be carried out at least once in every period of twelve months by a safety and health advisor. In regard to compliance with occupational health and safety Act a notification of intent before commencement of construction is required to be given to Directorate of occupational health and safety services none of the respondents indicated that they complied with this requirement.

The enforcement mechanism for health and safety can be said to be weak and wanting. The absence of pressure which can be brought to bear on occupiers/contractors of construction means some less scrupulous owner/managers usually take advantage of the lack of punitive deterrent measures to place economic gain above other business objectives including health and safety. It was therefore not uncommon to find some occupiers/contractors who would manage the sites without bothering the least about health and safety issues. Proper healthy and safety mechanisms not only contribute to the well being of the worker but the effectiveness of the entire project

6. Challenges in the Management of Health and Safety in Construction Sites

Some of the major challenges in the management of health and safety in the constructions sites noted by the survey included but not limited to; inadequate personal and protective equipment, poor maintenance of personal protective gear, lack of top management support in the management of health and safety in construction sites, inadequate enforcement mechanisms, inadequate welfare facilities, absence of safety and health committees, unawareness of health and safety matters among the workers and lack of equipped first aid kits on the construction sites. Welfare facilities were also noted as a big challenge since they are not adequately provided as well as personal protective equipment. Some site

supervisors indicated that lack of adequate funds, lack of monitoring and evaluation, lack of personal protective equipment implementation programs among others as some of the factors that give rise to the above challenges.

The site supervisory staff and construction workers suggested that the provision of protective gear, formation of safety committees, inspections by the government, and training and education as measures to mitigate some of the major challenges encountered in the construction sites However due to lack of enforcement mechanisms such as site inspections to check adherence to health and safety requirements on the various measures the suggestions still remain unimplemented.

7. Recommendations

- Employers and contractors should provide suitable programs that are consistent with national Laws and Regulations to ensure the health and safety of workers. This includes maintaining a workplace that has minimal risks and accidents that can result in injury or death. They should also ensure that a competent person inspects the construction project site at suitable intervals to ensure safety guidelines are adhered to. - Employers must make an assessment of the health and safety risks to which employees and others are exposed on construction sites. The significant findings must be recorded where five of more people are employed. Since managing health and safety is different from managing any other aspect in construction there need to do a risk assessment to find out about the risks, and to put sensible measures in place to control them, and make sure they stay controlled. - Contractors must keep accident registers at sites, and make record of all kind of accidents from minor bruises to major and fatal accidents, and submit reports to Directorate of Occupational Health and safety services. All employees must be given health and safety induction training when they start work, which should cover basics such as first aid and fire safety. Training must also be provided if risks change, and refresher training when skills are not frequently used. - Contractors should make provision for safety and health when preparing bids. The provision for safety and health must be made competitive with the aim to compete with other bidders and to avoid a monetary loss. Costs for Personal Protective Equipment's measures should be explored and explicitly be part of tendering and costing for the project implementation. - Site supervisory staff should be sensitized with Occupational Health and Safety and should share that knowledge with co-workers. The supervisors should incorporate

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