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Assessment of Health and Safety Item on Construction Sites in Ondo State

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***Abstract*—**The well been of human beings on construction site is very important, many man power had been lost through accidents which kills or make workers physically unfit to carry out construction activities, these in turn have multiple effects on the whole economy. Thus it is necessary to put all safety items and regulations in place before construction activities can commence. This study was carried out in Ondo state of Nigeria to known and analyse the state of health and safety of construction workers in the state. The study was done using first hand observation method, 50 construction project sites were visited in 10 major towns of Ondo state, questionnaires were distributed and the results were analysed. The result show that construction workers are being exposed to a lot of construction site hazards due to lack of inadequate safety programmes and non-provision of appropriate safety materials for workers on site. From the data gotten for each site visited and the statistical analysis, it can be concluded that occurrence of accident on construction sites depends significantly on the available safety facilities on the sites. The result of the regression statistics show that the level of significant of the dependence of occurrence of accident on the availability of safety items on site is 0.0362 which is less than 0.05 maximum significant level required. Therefore a vital way of sustaining our building strategy is by given a detail attention to provision of adequate health and safety items on construction sites which will reduce the occurrence of accident, loss of man power and death of skilled workers among others.

***Keywords*—**Construction sites, health, safety, welfare.

I. Introduction

SAFETY is the condition of being safe or free from danger or risk. It is the control of recognized hazards to achieve an acceptable level of risk. Health is the level of functional or metabolic efficiency of a living organism. In human, it is the general condition of a person's mind and body, usually meaning to be free from illness, injury or pain. Reference [1] defined health in its broader sense in 1964 as a state of complete physical and social well-being and not just merely the absence of disease or infirmity. Safety at work is a complex phenomenon, and the subject of safety attitudes and safety performance in the construction industry is even more so. In the construction industry the risk of a fatality is five times more likely than in a manufacturing based industry, while the risk of a major injury is two and a half time higher than that of a manufacturing based industry. Each year, up to 120 people are killed on construction sites in the UK and there are about 3000 workers who suffer from a major injury in construction related accidents [2]. Construction is widely regarded as an accident prone industry, the reasons why construction is risky and prone to health and safety risks are because of the physical environment of the work, nature of the construction work operations, construction methods, construction materials, heavy equipment used, and physical properties of the construction project itself [3]-[5].

Workers in a construction site may be exposed to various hazardous substances and physical agents, e.g. asbestos, lead, silica dust, organic solvents, sewer gases, welding fumes, radiation, noise and vibration. Excessive exposures to these substances/agents may result in acute injury, chronic illness, permanent disability or even death. The risk of accidents may be increase by loss of concentration at work and fatigue which arises from poor health conditions. Construction work is featured by high labour turnover, constantly changing working environment and conditions on site, different types of work are being carried out simultaneously by several contractors. These features would further increase the health risks of workers. Long-term disability is another critical case experienced by many construction workers, [6] followed a cohort of 5137 men in Geneva over twenty years and report that only 57 per cent of construction workers reached 65years of age without suffering a permanent impairment. Falls and manual handling are prominent risk factors associated with serious injuries and long-term disability in construction [7], [8].

Construction work also exposes workers to a wide range of health problems from asbestosis to back pain, hand and arm vibration syndrome, cement burns etc. Fig. 1 shows the % of accidents in Indonesia construction industries and other sectors between 2007 and 2010. The figure is an indication that so many accidents occur on construction sites on yearly basis and the issue of health, safety and welfare facilities should be of priority on all construction sites.

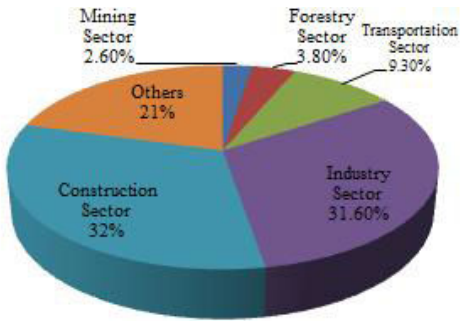

Fig. 1 Comparison of Accident in Construction Industry and others [9]

Health and safety regulations should be designed into constructions sites before the building phase, during the

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building phase and after the building phase so as to ensure effective utilization of that structure. It is cheaper and easier to control the risks to which workers are exposed in construction sites before commencement of work on site. These risks can be controlled by these steps; Putting in place a policy for machinery and work equipment operations, setting health and safety requirements in tender specifications, planning the work process to minimize the number of workers who could be harmed, starting your control activities before getting to site (for example, by planning, training, site induction and maintenance activities), ensuring all persons, including managers are trained and able to carry out their work without risk to the safety or health of themselves or other workers, ensuring all workers puts on their personal protective equipment adequately (PPE) before commencement of work in construction site [10]. PPE should not be substituted for taking safety measures. A well planned site layout and process control can often eliminate most hazards on worksites. If the use of PPE is an appropriate control measure, the programme should cover: how it is selected, maintained; and how its use is evaluated; training of employees using the PPE; and vigilance of the programme to determine its effectiveness in preventing workers from injury or illness (The Real Estate Developers Association of Hong Kong and The Hong Kong Construction Association, 2005).

This study provides an explanatory study of health and safety items on construction sites in Ondo state.

II. Material and Method

The study was carried out in Ondo State of Nigeria its geographical coordinates are 7° 6' 0" North, 4° 50' 0" East and the map shown in Fig. 2. A total of 50 construction sites were visited in 10 major towns of the state with 5 sites visited from each town to have a broad knowledge of the state of health and safety items on construction sites in the state, their present rating conditions and how often they are put to use. These towns are; Akure, Owo, Ondo, Ore, Okitipupa, Owena, Idanre, Igbaraoke, Akungba and Ibule. The questionnaire was designed to address issues like different type and present conditions ofdifferent available health facilities and personal protective Equipment (PPE) on construction sites, sanitary facilities present in the site, types of training in-safety offered to workers and appointment of safety officers on construction sites.

Fig. 2 Map of Ondo State

A full inspection of the construction site, workers, and welfare facilities activities were carried out. Data were collected with the help of well-prepared questionnaire containing series of health, safety and welfare questions which was answered either by the civil engineer in charge, site engineer, site supervisor, contractor, builder or the quantity surveyor.

III. Results and Discussions

The results obtained are presented in Tables I-III and Figs. 3, 4 and for both health and welfare facilities. The tables show the responses given on a 5 point scale rating, from very good to very bad; 1=Very bad, 2 =Bad, 3=Fair, 4=Good, 5=Very Good. The answered varied differently, depending on the type and condition of safety and welfare items presents in each site at the time of this research.

The results of the safety items in Fig. 3 and Table I show the general rating for the 5 sites in each town, it is clearly shown that only Akure, IgbaraOke and Akungba has all the safety facilities while the other towns lack one or two facilities.

Similarly, Table II and Fig. 4 show the general rating for the 5 sites visited in each town, it also clearly shown that Akure, IgbaraOke, Ondo and Akungba has all their welfare indicators complete, the remaining towns lack one or more welfare facilities.

Statistical analysis of the safety facilities and occurrence of accident obtained in all the sites from the 10 towns are shown in Table III.

TABLE I
Safety Indicators Rating for all the Towns

	SAFETY ITEMS					
TOWN	SAFETY HELMET (OA)	SAFETY BOOT (SB)	SAFETY GOOGLES (SG)	TRAINING IN SAFETY (TIS)	APPOINTMENT OF SAFETY OFFICER (ASO)	OCCURRENCE OF ACCIDENT (OA)
AKURE	4.80	4.60	4.00	1.60	2.20	1.2
IGBARA OKE	4.75	4.75	2.50	2.25	3.25	1.5
IDANRE	5.00	4.00	0.00	0.00	0.00	4.5
ONDO	3.80	4.20	0.00	0.00	2.70	3.4
IBULE SORO	4.75	3.25	0.00	0.00	0.00	4.75
OWENA	2.33	4.67	0.00	0.00	0.00	4.33
ORE	1.67	1.33	0.00	0.00	0.00	4.67
OKITIPUPA	2.25	4.00	0.00	0.00	0.00	3.75
OWO	2.67	3.67	0.00	1.00	1.33	3.0
AKUNGBA	4.50	4.75	1.25	1.25	1.25	1.5

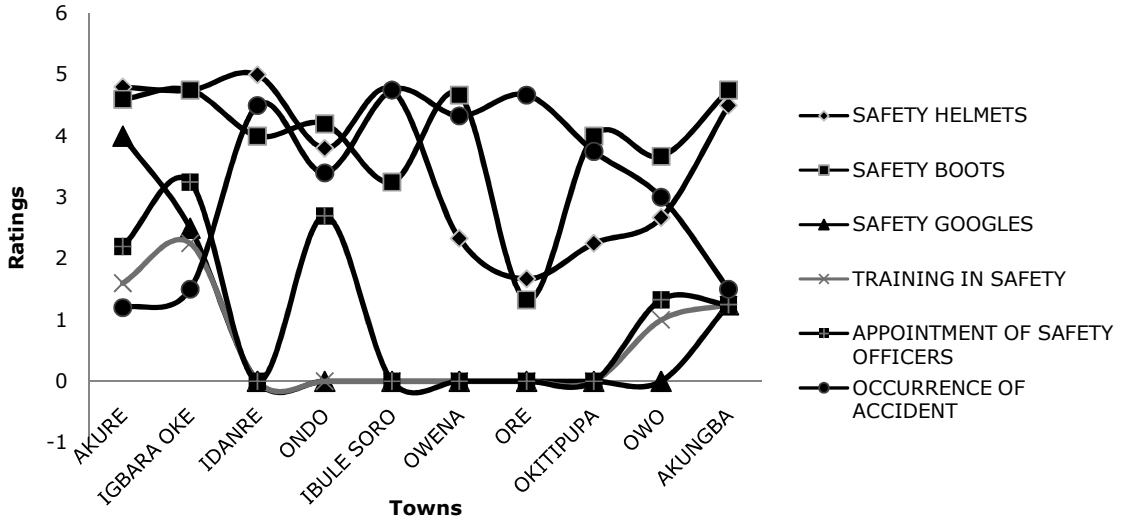

Fig. 3 Safety Items in Each Town Compare with the Occurrence of Accident

TABLE II
WELFARE INDICATOR RATINGS FOR ALL THE TOWNS

	WELFARE FACILITIES				
TOWNS	**Safe Drinking Water**	**Sanitary Facilities**	**Accommodation to change and Store Clothing**	**Means of Heating Food**	**First Aid Box**
AKURE	4.60	3.40	3.80	2.60	3.00
IGBARA OKE	4.75	4.25	3.00	4.25	4.25
IDANRE	5.00	0.00	1.50	0.00	0.00
ONDO	4.40	3.40	2.00	0.80	0.80
IBULE SORO	4.75	1.00	1.00	0.00	0.00
OWENA	4.33	1.00	3.00	0.00	0.00
ORE	4.00	1.00	2.67	0.00	0.00
OKITIPUPA	4.50	3.25	2.25	0.00	0.00
OWO	4.67	1.67	4.00	0.00	1.00
AKUNGBA	4.75	3.00	3.25	1.00	1.00

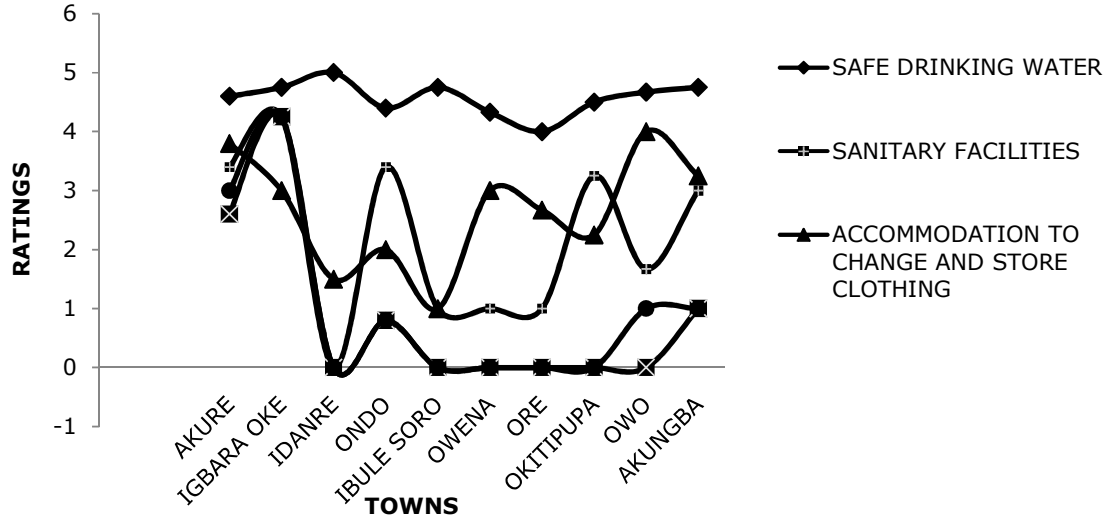

Fig. 4 Welfare Facilities and their Indicator Ratings for all the Towns

TABLE III
SUMMARY OUTPUT OF THE STATISTICAL ANALYSIS OF THE SAFETY FACILITIES AND OCCURRENCE OF ACCIDENT OBTAINED IN ALL THE SITES

Regression Statistics					
Multiple R	0.951				
R Square	0.904				
Adjusted R Square	0.785				
Standard Error	0.650				
Observations	10.000				
ANOVA					
	df	*SS*	*MS*	*F*	*Significant F*
Regression	5	15.969	3.194	7.570	0.036
Residual	4	1.688	0.422		
Total	9	17.657			
	Coefficients	*Standard Error*	*t Stat*	*P-value*	
Intercept	4.913	0.964	5.095	0.007	
SH	0.124	0.211	0.586	0.589	
SB	-0.302	0.258	-1.168	0.308	
SG	-0.272	0.285	-0.955	0.394	
TIS	-0.826	0.526	-1.568	0.192	
ASO	-0.193	0.261	-0.738	0.501	

The result of the regression statistics shows that the level of dependence of occurrence of accident on the availability of safety items on site is highly significant at P < 0.036 with a level of confidence 99.9638%.

The linear regression analysis equation is shown in (1);

$$0A = 0.124SH + 0.302SB + 0.272SG + 0.826TIS + 0.193ASO + 4.913 \quad (1)$$

IV. Conclusion and Recommendations

The well been of human beings on construction site is very important , where man power is lost through accidents which kills or make workers physically unfit to carry out construction activities, these will have multiple effects on the whole economy. Thus it is necessary to put all safety items and regulations in place before construction activities can commence. This study reveal that construction workers are being exposed to a lot construction site hazards due to lack of inadequate safety programmes and non-provision of appropriate safety materials for workers on site. Based on the data gotten for all the sites in the towns visited, it can be concluded that not more than 30% of those sites visited in each town have complete safety items and welfare facilities on sites. Out of the 10 towns visited, 3 towns have all the safety and welfare items completed even though some of these items have very low ratings. Some accidents will not surface immediately but later in life like eyes problem and in 7 of the towns visited no safety goggles was available on sites. This is to say only few sites workers in Ondo state practice a good health and safety policy on construction sites. Similarly means of heating food and first aid box were trivial issue in almost all the towns except Igbara Oke. These welfare items should be of utmost importance in any construction sites. Non availability of these basic essential health and welfare facilities like toilets, drinking water, rest facilities, lighting, fire extinguisher and First Aid box among others may worsen the state of health of construction workers in a nation thereby promoting poverty rather than alleviating it and also weakening the nation capacity building strategy. A construction site fully provided with adequate and good health, safety and welfare facilities items will reduce construction accident as well skilled workers death record thereby sustaining the nation building strategy. Policies and regulations with respect to safety and welfare facilities need to be developed and implemented.

Based on the research findings and preceding discussion, the author recommended that review of existing safety regulations and provision of adequate personal protective equipment for workers should be ensured by the Government, client, contractors and even workers.

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