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Research Paper

Evaluation of Safety Measures, Compliance, and Compensation In Lagos State Government Building Construction Projects

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ABSTRACT: *The construction industry in Lagos State, Nigeria, plays a pivotal role in economic development but faces significant challenges related to safety, compliance, and worker compensation. This study aims to evaluate the safety measures, compliance levels, and compensation practices in Lagos State government building construction projects, with a view to identifying prevalent hazards, assessing the adequacy of safety protocols, and improving worker welfare. A total of 475 questionnaires were administered to contractors, construction workers, safety officers, and other stakeholders, complemented by key informant interviews to gather in-depth insights. Findings reveal that while basic safety measures such as hazard signage and protective equipment are provided, their quality is often substandard, compromising effectiveness. Workers demonstrate commendable compliance with safety protocols but express dissatisfaction with compensation mechanisms, which are often inadequate, delayed, or conditional on extensive reporting. Prevalent hazards include unguarded machinery, exposure to harmful substances, and fall risks, with medical treatment being the most common form of compensation. The study underscores the urgent need for enforcing stricter safety regulations, improving hazard mitigation strategies, and establishing fair and transparent compensation systems. Recommendations include mandatory safety training, regular audits, provision of high-quality protective equipment, and the development of robust compensation frameworks to promote a safer and more equitable construction environment in Lagos State.*

KEYWORDS*: Construction safety, Hazard management, Compliance, Worker compensation.*

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I. INTRODUCTION

Hazards are common occurrences in building construction sites, often leading to injuries, incapacitation, and fatalities. The construction industry has been widely criticized for its poor safety performance, making it one of the most dangerous occupations globally (Ajayi, 2014). Hazards such as contact with unguarded machinery and exposure to harmful substances are prevalent, exacerbated by the employment of untrained workers to cut costs. Consequently, construction sites frequently record high rates of work-related injuries and illnesses, often attributed to inadequate safety practices and poor adherence to safety regulations (Lateef, Emmanuel, & Olayinka, 2021).

In Nigeria, the construction industry plays a significant role in economic growth, contributing 10.17% to the nation's GDP in 2021 (National Bureau of Statistics, 2022). Lagos State, a major hub for construction activity, exemplifies both the sector's economic importance and its safety challenges. The state's construction projects face persistent issues, including unregulated practices, the absence of proper hazard reporting systems, and a lack of accountability for worker safety. These challenges are compounded by the predominance of transient, unskilled laborers and contractors who often fail to implement adequate safety measures.

Despite its vital contributions to the economy, the construction sector in Lagos is marred by preventable accidents, which sometimes culminate in catastrophic events such as building collapses. Records of safety incidents are scarce, and hazards on sites remain poorly documented. For example, the Lagos State Ministry of Works and Infrastructure lacks a comprehensive database of safety incidences, making it difficult to design targeted interventions.

Globally, the construction industry accounts for 30%-40% of workplace fatalities, with workers being three times more likely to die or be injured compared to those in other sectors (Dodo, 2014). However, in Nigeria, safety conditions are worse due to limited regulation and enforcement. Studies such as Idoro (2011) and Dodo (2014) have highlighted the need for stricter laws and monitoring of safety practices but have not extensively addressed the prevalence of hazards or compliance with safety measures on government construction sites.

Furthermore, there is a dearth of research on compensation for construction workers exposed to hazards, despite evidence that adequate compensation improves job satisfaction and productivity (Thuita & Oiye, 2018). Many contractors fail to provide workers with proper benefits, such as health insurance and hazard-related compensation, further marginalizing the workforce. This lack of empirical data on safety compliance and compensation practices in Lagos government projects necessitates focused research.

Therefore, this study evaluates the safety measures, compliance levels, and compensation systems in Lagos State government building construction projects. It seeks to address critical gaps by identifying prevalent hazards, assessing compliance with safety protocols, and appraising workers' satisfaction with compensation practices. These findings aim to inform policies and strategies to enhance safety, ensure fair compensation, and foster a sustainable construction environment in Lagos State.

STUDY AREA

Lagos State, the study area, is one of Nigeria's 36 states and a former federal capital. Located in the southwestern region of the country, Lagos is Nigeria's most urbanized and densely populated state, with a land area of 351,861 hectares. It comprises five administrative divisions—Ikeja, Badagry, Ikorodu, Lagos (Eko), and Epe—divided further into 20 Local Government Areas and 37 Local Council Development Areas. As of 2015, Lagos State's population was estimated at 24.6 million, making it Africa's foremost urban hub and the sixth megacity globally. Metropolitan Lagos alone accounts for over 85% of the state's population on just 37% of its land area. Known for its rapid urbanization (6%-8% annually), Lagos is also home to key economic and political activities within Africa. It houses significant infrastructural landmarks, including the Lagos State Government Secretariat and numerous business districts like Ikeja, the state capital. The Lagos State Ministry of Works and Infrastructure oversees the planning, implementation, and supervision of government construction projects, reflecting the state's role as a driver of national and regional development.

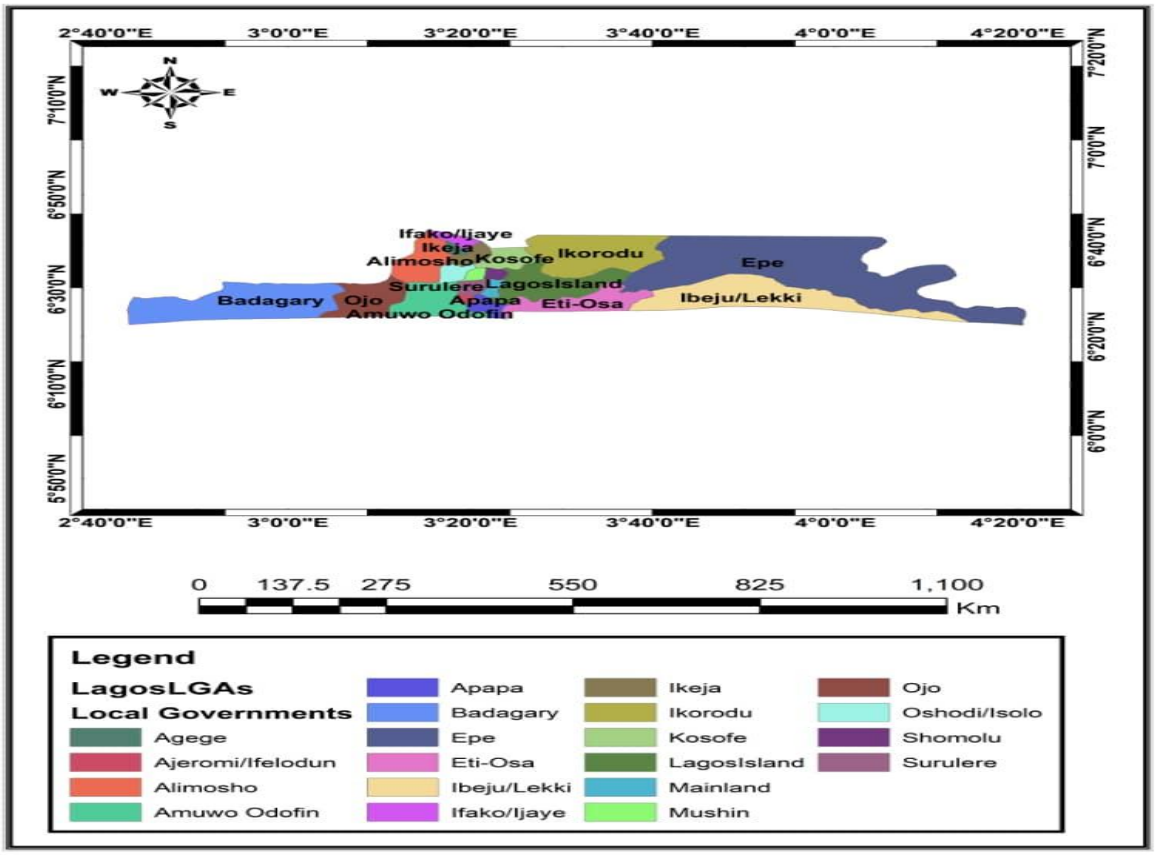

Figure 1.3: Map of Lagos State
Source: Floral Diversity in the Wetlands of Ibeju-Lekki Area, Lagos, Nigeria (2016)

II. LITERATURE REVIEW

The construction industry is fraught with hazards, ranging from physical injuries and environmental risks to long-term health issues caused by exposure to toxic materials. Olugbenga, Chukwurah and Sina (2019) emphasize that construction sites often contain flammable, radioactive, toxic, corrosive, or explosive materials, necessitating proper planning and mitigation strategies. Measures such as using advanced machinery to minimize diesel consumption, implementing dust control systems like sprinklers, and ensuring the proper disposal of wastewater can significantly reduce risks associated with air and water pollution. Similarly, adherence to safety protocols, such as covering trucks carrying construction materials, restricting the burning of waste, and using non-toxic paints and adhesives, helps to protect workers and the surrounding environment (Asiedu, *et al.*, 2021). In Nigeria, the absence of cohesive safety guidelines and reliance on substandard materials further exacerbate the risks. The use of hazardous construction materials such as silica, asbestos, and lead compounds contributes to severe health issues, including lung diseases and occupational cancers. A standardized framework for material quality, combined with stricter regulatory enforcement, is vital for improving safety performance (Author's Field Survey, 2022).

Effective safety management systems (SMS) are critical to reducing workplace injuries and fostering a culture of safety. These systems integrate policies, planning, accountability, and tools to address site-specific hazards and ensure compliance with safety standards. Modern platforms, such as iAuditor, streamline safety risk assessments, improve communication among team members, and centralize documentation for continuous improvement (iAuditor by Safety Culture, n.d.). However, the Nigerian construction sector often struggles with gaps in training, inadequate wages, and a lack of modern equipment, which not only increase the likelihood of accidents but also contribute to poor worker morale and high turnover rates. Workers are frequently exposed to hazardous conditions, including extreme noise, vibrations, and toxic substances, resulting in occupational illnesses such as carpal tunnel syndrome, dermatitis, and vibration-related injuries. Beyond immediate dangers, the long-term implications for workers' health can be devastating, as seen in the prevalence of chronic illnesses and disabilities among construction workers in Nigeria (Health & Safety Executive, 2022).

Failure to implement effective health and safety measures has far-reaching consequences for the construction industry in Nigeria. The sector has consistently recorded high rates of accidents, fatalities, and injuries, resulting in reduced productivity and significant legal liabilities. A lack of adequate compensation mechanisms further aggravates the situation, leaving workers vulnerable and often unprotected. Robust compensation frameworks, including medical benefits, wage replacement, and rehabilitation programs, play a crucial role in mitigating these risks. Such frameworks not only protect workers but also hold employers accountable, encouraging the adoption of safety protocols and investments in safer technologies (Opeyemi, Razali, and Mohd, 2018). Furthermore, fair and timely compensation improves employee morale, reduces stress, and promotes a safer working environment. As Nigeria's construction industry continues to grow, addressing these challenges through comprehensive health and safety policies, risk assessments, and training programs will be pivotal for safeguarding the workforce and ensuring sustainable development in the sector.

III. RESEARCH METHODOLOGY

The research methodology employed a multi-methodological approach, combining both quantitative and qualitative research designs to ensure a comprehensive investigation. Quantitative tools, such as field measurements and structured questionnaires, were complemented by qualitative methods including ethnographically-oriented key informant interviews (KIIs). This methodological triangulation enhances the validity and reliability of findings (Okafor, 2002; Onwuegbuzie & Leech, 2006). The study focused on construction professionals, contractors, workers, and safety officers within Lagos State's Ministry of Works and Infrastructure and Safety Commission. A multistage sampling technique was adopted, targeting specific groups: 10% of construction professionals (26 respondents), all 62 contractors, 354 construction workers, 23 safety officers, and 10 key tradesmen, resulting in a total sample size of 475 participants.

Data collection involved structured questionnaires addressing topics such as hazard incidence, prevalent risks, safety measures, compliance levels, and compensation satisfaction, alongside KIIs with experienced tradesmen to gather in-depth insights. Statistical analysis, conducted using SPSS (version 20), included descriptive statistics, ANOVA, and Scheffe's post hoc tests to explore variations in hazards and safety measures across sites, providing a nuanced understanding of safety practices and their implications for hazard reduction in Lagos State construction projects.

IV. FINDINGS

Safety Measures and Level of Workers' Compliance

The safety measures that are provided by contractors to minimise hazards effects on construction sites consist of safety equipment such as fall protection systems and guardrails (4.32). However, further interaction with the construction workers shows that the safety equipment provided are substandard which often worsen

emergency situation than guaranteeing safety. Also, provision of hazard warning signage (4.28) as a safety device coupled with the introduction of protocols to lift or carry heavy object (3.89) are adequate safety measures on the construction sites.

Lastly, workers' compliance to some safety measures in the study area is encouraging. It was reported that construction equipments were handled with utmost care, particularly proper fixing and prior inspection of scaffolding before mounting by workers has the highest acceptability of 4.13. This could be a measurable indicator of assessing workers' awareness on major causes of hazards and inadequate compensation of accident victim. Resultantly, construction workers preferred to minimise hazard occurrence rather than being a victim with little or no compensation for the suffering experienced.

Table 1.0: Safety Measures and Precaution Procedures

							Contractors and workers			Construction
S/N	**Safety Measures and Precaution Procedures**	**SA**	**A**	**I**	**D**	**SD**	**N**	**Sum**	**Mean**	**Rank**
1	Ensure all relevant safety equipment such as ladders, fall protection systems, guardrails are up to standard	1045	724	81	42		377	1892	5.02	**1**
2	Adequate hazards warning signage on site	935	800	108	30		377	1873	4.97	**2**
3	Training of workers on safety tips and company policy	980	716	117	36	06	377	1855	4.92	**3**
4	Have inspection checklists ready-made for employees on the clock	805	876	93	48	03	377	1825	4.84	**4**
5	Regular disposal of waste on site	720	876	177	32		377	1805	4.79	**5**
6	Provide safety training resources so that employees can stay clued up on what constitutes safe manual handling	670	900	183	24	06	377	1783	4.73	**6**
7	Provision of modern tools and equipment for site workers	695	860	174	46	03	377	1778	4.72	**7**
8	Conducting safety meetings to keep workers on the lookout and answer workers' questions	615	888	252	18		377	1773	4.70	**8**
9	Provision of workplace safety guidelines specific to electrical work hazards	710	808	201	54		377	1773	4.70	**8**
10	Provision of ties, chutes and netting to prevent falling debris	690	816	180	72		377	1758	4.66	**10**
11	Provide two-way communication for employees to inform their superiors of noise that they were not adequately prepared for	305	848	516	66	03	377	1738	4.61	**11**
12	Perform maintenance checks on PPE and fill in quality control forms	565	892	225	48	03	377	1733	4.60	**12**
13	Supply training guides on how to detect damaged/exposed wires and understand the severity of coming into contact with electrical current	715	648	327	42	03	377	1735	4.60	**12**
14	Ensuring employees fill in checklists to confirm that they are wearing Personal Protective Equipment (PPE)	575	876	204	60	06	377	1721	4.56	**14**
15	Provision of checklists for employees to inspect the quality of their PPE	435	988	258	30	03	377	1714	4.55	**15**
16	Take photos to confirm that safety warnings and barrier systems are in place	630	616	438	24		377	1708	4.53	**16**
17	Introducing protocols and workflows that will reduce the time spent lifting/carrying heavy objects	485	900	276	42	03	377	1706	4.53	**16**
18	Unstable communication which surfaces at any point in time	470	924	216	82		377	1692	4.49	**18**
	Valid N						**377**			
	Mean Score = 4.70									

Source: Author's Field Survey, 2023

Hazards Compensations

With respect to compensations of accident victim on construction sites, the most prevalent form of compensation is medical treatment (AI=4.21) of workers; followed by compensation for disability (AI=3.66) and compensation paid when reports are made (AI=3.65). This is because substantive evidence is needed by the contractors to justify compensation claim for any workers.

Workers' Satisfaction with Compensations

Workers were not satisfied with the compensation made to accident victim (AI=3.29) on the basis of construction experience, educational qualification and possible future medical problems.

Ways of Reducing Hazards and Improving Safety on Construction Sites in the Study Area

The study revealed respondents' suggestion on ways to minimise aftermath of hazard on construction sites which are availability of adequate first aid kit (RDI=4.59), enforcement of safety rules and guidelines (RDI=4.57), use of hazard warning signages (RDI=4.53) and establishment of safety orientation for construction workers (RDI=4.47).

Table 1.2: Hazard Reduction Mechanisms

		Construction workers				Safety Officers			
S/N	**Reduction of hazard occurrence**	**N**	**Sum**	**Mean**	**Rank**	**N**	**Sum**	**Mean**	**Rank**
1	Enforcement of proper safety techniques	438	2003	4.57	**2**	21	99	4.71	**1**
2	Establishment of an effective training program which improves workers' skill related to the actual safety hazards identified	438	1948	4.45	**6**	21	99	4.71	**1**
3	Establishment of an effective safety program which addresses the actual safety hazards	438	1959	4.47	**5**	21	96	4.57	**3**
4	Assessment of risk on site before commencement of work on a daily basis	438	1887	4.31	**9**	21	96	4.57	**3**
5	Maintenance of working machines and equipment regularly	438	1919	4.38	**8**	21	95	4.52	**5**
6	Enforcement of compliance to safety rules and regulations on site always	438	1976	4.51	**4**	21	94	4.48	**6**
7	Using of effective signage for dangerous areas on construction sites	438	1985	4.53	**3**	21	91	4.33	**7**
8	Ensuring availability of good first aid kit at all time	438	2010	4.59	**1**	21	91	4.33	**7**
9	Enforcement of regular breaks and lunch breaks for site workers	438	1865	4.26	**10**	21	90	4.29	**9**
10	Provision of high quality Personal Protective Equipment (PPE)	438	1925	4.39	**7**	21	81	3.86	**10**
	Valid N	**438**				**21**			
	Mean	**44.46/10 = 4.45**				**44.37/10 = 4.44**			

Source: Author's Field Survey, 2023

V. CONCLUSION AND RECOMMENDATIONS

Findings revealed that hazards on construction sites in Lagos State government projects are primarily attributed to inadequate safety measures and the use of substandard equipment, as indicated in Table 1.0 above. For instance, although fall protection systems and guardrails were provided, they were often of poor quality, which undermines their effectiveness during emergencies. It is recommended that all safety equipment and materials used on construction sites adhere to high-quality standards to ensure proper functionality.

Furthermore, compensation practices for accident victims were found to be insufficient and inconsistent. While medical treatment was the most common form of compensation, other essential provisions, such as clear compensation guidelines and disability benefits, were inadequately addressed (Table 4.2). To improve workers' welfare, clear and standardized compensation policies should be enforced, considering factors such as years of experience and potential future medical complications.

The study also highlighted significant gaps in hazard mitigation strategies. While measures such as hazard warning signage and enforcement of safety protocols were implemented, key recommendations include establishing comprehensive safety training programs, regular maintenance of equipment, and the consistent use of effective hazard warning signage (Table 4.3). These initiatives will enhance workers' awareness and ensure compliance with safety regulations.

On a general note, enforcement of proper safety techniques and availability of first aid kits were ranked among the highest-rated suggestions for hazard reduction by both construction workers and safety officers, with mean ratings of 4.59 and 4.71 respectively. It is essential for future construction projects to integrate these practices consistently to minimize hazard occurrences.

Finally, construction sites that adhered to robust safety practices and provided adequate compensations recorded higher worker satisfaction levels. It is recommended that the Lagos State government adopts a standardized safety framework, including periodic inspections and strict enforcement of compliance with safety protocols. This approach will not only improve worker safety and satisfaction but also promote sustainable practices in the construction sector.

Conflict of interests

The authors have not declared any conflict of interests.

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