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ASSESSMENT OF FINANCIAL COST OF ACCIDENT IN BUILDING CONSTRUCTION SITES IN ABUJA

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Abstract

The construction industry has been identified with the highest occurrence rate of accidents. Financial cost of construction accidents on building construction sites is an issue that constitute the problem of this study; a lot of financial losses are applicable to it both in human and material losses. The objectives of the study were to identify and rank the accidents peculiar to building construction projects in Abuja, determine the relationship between accident cost and building construction cost and determine whether the cost of accident predicts cost of construction. The study began with the review of literature, books, journals and web pages. A field survey was conducted and archive data were used from construction companies. Questionnaires were administered through simple random sampling technique in Abuja. The data was analysed using correlation and regression. According to the research, fall from height was rated the highest with 24%. It was closely followed by fall from same level with 20%. Collapse of scaffold was ranked third with 15%. Injury from equipment, slip and trip, struck by moving object and collapse of building or part of it were ranked the least. There is a positive impact between accident costs on the total cost of building construction.

Keywords: Accident, Accident cost, Building construction, Construction sites, Safety.

Introduction

The construction industry covers a wide range of activities ranging from large-scale civil engineering projects to very small house extension. The industry has been identified with the highest occurrence rate of accidents compared to any other industry. Anny and Sritomo (2015) stated that a construction project is prone to accidents due to its dangerous characteristics and unpredictable changes. Jallon (2011) asserted that accident will give a negative impact to the employers, employees and even to the nation as a whole.

Accidents as defined by Health and Safety Executives (HSE, 2017) as any unplanned event that results in injury or ill health of people, or damage or loss of property, plant, materials or the environment or loss of a business opportunity. Hale and Walker (2012)

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opined the prevention of accident is essential to secure and maintain a healthy and safe construction site so as to avoid the financial costs of construction accidents. Financial cost of construction accidents represent the losses incurred by the private investor such as contractors, due to the occurrence of construction site accidents. It is a great challenge for all those involve in the construction industry to improve this situation by taking effective action to minimise the risk of accidents and ill health. Financial cost of accidents is relatively complex since many visible and hidden costs should be taken into account in order to get an accurate estimate. Gavious (2009) asserted that accident cost estimation is a lengthy process and requires proper training and guidance before getting use to it.

Any accident or incidence of ill health will cause both direct and indirect cost. Sun (2010), stated that there are four (4) cost components that are important in estimating the indirect cost; they include productivity cost, worker replacement cost, legal and administrative cost and investigation cost. Kamaruzzaman and Sing (2010), asserted that accident does not only cause injury to workers, it can also destroy tools, equipment and materials. Direct cost includes cost of medical treatment, cost of rehabilitation of worker before he returns to work, compensation paid to injured worker, cost due to inefficiency of the worker who just recovered from injury upon resuming work. This research is aimed at assessing the extent at which accidents on building construction site affect the cost of a project.

The aim of this study is to assess impact of the financial cost of accidents on building construction project on site with a view to bring about a reduction in the cost of construction site accident.

The objectives of this study are to:

1. Identify the causes of accidents on building construction sites.
2. Identify and rank the accidents peculiar to building construction project in Abuja.
3. Determine the relationship between accident cost and building construction cost.
4. Determine whether the accident cost predicts cost of construction project.

Methodology

The objective of this research is to assess the financial cost of accidents on building construction projects on site. These objectives was be achieved using two main approaches mainly Primary and Secondary sources of data. The literature review was used to identify all building construction site accidents and to determine the types of accidents on building construction projects. Research journals, academic thesis and conference papers were the main sources of the secondary data gathered. The secondary data helped in shaping out the structure of the research questionnaire. The Primary source of data represents the main source of data used for the research. Two

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sets of questionnaires were used to collect information for this research; one was used to collect information on the types of accidents peculiar to building construction project in Abuja and the second was used to collect achieve data on the cost of accidents on previously completed projects and the building cost of those projects. The field survey involved 50 building construction companies in Abuja with over 20 years' experience in building construction project. In achieving this, the first set of the questionnaire were administered to construction professionals to collect information on peculiarity of accidents on construction sites in Abuja. The second sets of well-structured questionnaires were distributed to those construction companies with over 20 years' experience in building construction project to be filled by Registered Quantity Surveyors (RQS) who are also members of Institute of Safety Professionals of Nigeria (ISPON). The data collected was analysed using correlation and regression.

Results

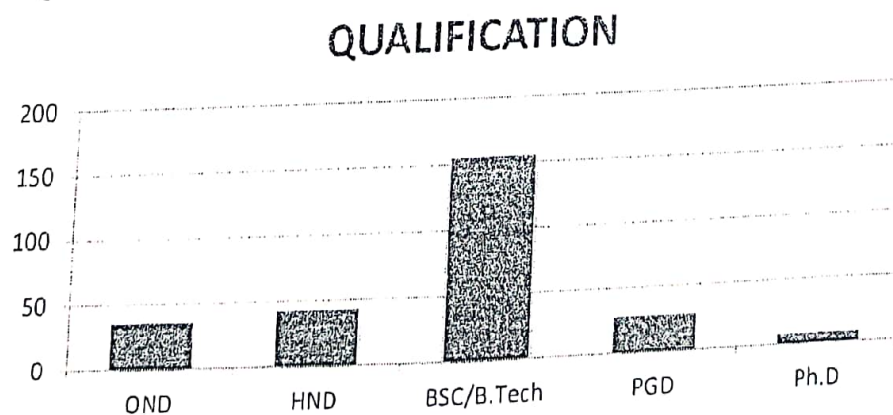
Table 1 shows clearly the qualification of the respondents; it means the respondents are well educated and their responses can be relied upon.

Table 1 Qualification of Respondents

QUALIFICATION	NUMBER	PERCENTAGE %	CUMULATIVE %
OND	36	13.33	13.33
HND	43	15.93	29.26
BSC/B.Tech	155	57.41	86.67
PGD	28	10.37	97.04
Ph.D	8	2.96	100
TOTAL	270	100%	

Source: Researchers survey (2019)

From the bar chart Fig 1, it shows a graphic representation of the respondents. The largest of percentage of the respondent have BSC/B.Tech



Source: Researchers survey (2019)

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Work Experience

Table 2 shows that the respondents have work experience in the building construction industry as such, there responses can be relied upon.

Table 2 Work Experience

YEARS OF EXPERIENCE	NUMBER	PERCENTAGE %	CUMULATIVE %
0 - 5 YEARS	25	9.26	9.26
6 - 10 YEARS	48	17.78	27.04
11 - 15 YEARS	69	25.56	52.60
16 - 20 YEARS	40	14.81	67.41
21 - 25 YEARS	28	10.37	77.78
26 - 30 YEARS	42	15.55	93.33
31 YEARS AND ABOVE	18	6.67	100
TOTAL	270	100%	

Source: Researchers survey (2019)

Profession of Respondents

Table 3 show that all the respondents are professional in the construction industry and there opinion can be relied upon.

Table 3 Profession of Respondents

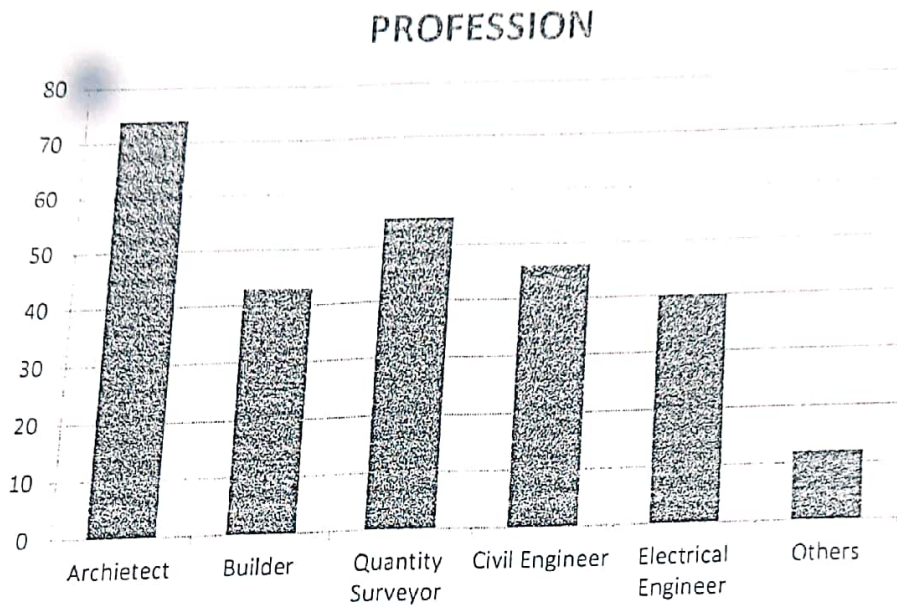
PROFESSION	NUMBER	PERCENTAGE %	CUMULATIVE %
ARCHIETECT	74	27.41	27.41
BUILDER	43	15.93	43.34
QUANTITY SURVEYOR	55	20.37	63.71
CIVIL ENGINEER	46	17.04	80.75
ELECTRICAL ENGINEER	40	14.81	95.56
OTHERS	12	4.44	100
TOTAL	270	100%	

Source: Researchers survey (2019)

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Figure 2 Professions of Respondents



Source: Researchers survey (2019)

Types of Accidents

Table 4 illustrates from survey, the view of respondents on the type of accident peculiar to building construction project in Abuja. The accident types were identified and rated with its frequency distribution from respondents.

From the survey, fall from heights rated highest with a rate of 24% among the types of accidents, fall from same level rated 2nd highest with a rate of 20% among the types of accidents, collapse of scaffold rated 3rd highest with a rate of 15% among the types of accidents, injury from equipment rated 4th highest with a rate of 14% among the types of accidents. Slip and trip rated 5th highest with a rate of 13% among the types of accidents, struck by moving object rated 6th highest with a rate of 7% among the types of accidents, Stepping on sharp object rated 8th highest with a rate of 4% among the types of accidents, collapse of building or part of it rated 9th highest with a rate of 1% among the types of accidents.

Table 4 Types of Accidents

S/N	TYPE OF ACCIDENT	FREQUENCY	PERCENTAGE
1	FALL FROM SAME LEVEL	55	20%
2	SLIP AND TRIP	34	13%
3	STEPPING ON SHARP OBJECT	12	4%
4	INJURY FROM EQUIPMENT	39	14%
5	COLLAPSE OF SCAFFOLD	41	15%

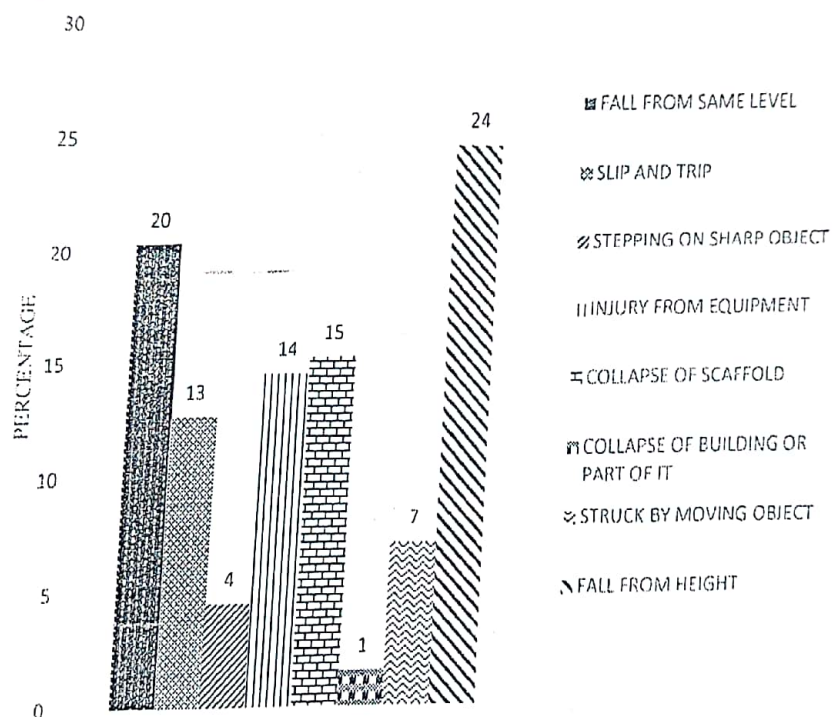
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6	COLLAPSE OF BUILDING OR PART OF IT	4	1%
7	STRUCK BY MOVING OBJECT	19	7%
8	FALL FROM HEIGHT	66	24%
	TOTAL	270	100%

Source: Researchers survey (2019)

Figure 3 Types of Accidents



Source: Researchers survey (2019)

Statistical Inference

The table 5 illustrate statistical inference between cost of accident and building cost showing that there exists a strong relationship between cost of accident and building cost. A Pearson product-moment correlation coefficient was computed to assess the relationship between cost of accident and building cost.

The correlation table reveal the mean of cost of accident and building cost to be X_1 and X_2 respectively. The mean value of $X_1=267013.53$ at a standard deviation of 135411.09 and the mean value of $X_2=152070967.77$ at a standard deviation of 36184308.43 and both variables at the same number of population ($N= 126$). The correlation coefficient r was observed to be > 0 where $r =0.406$, thereby indicating a

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positive relationship. $p = 0.000$ value was observed to be < 0.05 . There was a positive correlation between both variables thereby signifying that there exists a strong relationship between both variable. This has led to the acceptance of the hypothesis. Correlation is significant at the 0.01 level (2-tailed).

Table 5 Statistical Inference

	V	N	Mean	S.Dev	R	P.val	Strength of relationship	Inference remarks	Action on hypothesis
accident cost	X1	12	267013.53	135411.09	0.40	0.00	Strong	SS	Accept H1
building cost	X2	12	152070967.	36184308.	6	0			

Source: Researchers survey (2019)

KEY: Statistically Significant (SS)

Regression Analysis

Based on table 5, there is a positive and statistically significant relationship between accident cost and total cost.

From table 6, the coefficient of (R^2) was observed at 16.7% suggesting a weak relationship and the connection coefficient (R) watched was 40.9% also showing a weak relationship level of relationship amidst the variables. The estimation of the Fcal is 24.88 while the P-value estimation of 0.000 observed was less than 0.05. This implies that Total cost is predicted at Total cost = $123127212.51 + 0.000$ Accident cost.

Therefore H_1 is accepted.

Therefore H_2 is accepted.

Table 6 Regression Analysis

Model	Unstandardized Coefficients	Standardized Coefficients	R/R ² (%)	Adjusted R ²	Fcal	Pval	Inf. RMK	Action on Hypothesis
(Constant)	B	Std. Error	Beta					H_1
Linear Regression	123127212.51	6561358.40	40.9/16.7	0.160	24.88.000		SS	Accepted

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accident	109.40	21.93	.409	.000
cost				

Source: Researchers survey (2019)

KEY: Statistically Significant (SS)

Conclusion

Construction industry experiences accidents in different level of severity resulting to additional cost, thus altering the overall cost of executing the project. The study revealed the types of accidents peculiar to building construction projects in Abuja. According to the research, fall from height was rated the highest with 24%. It was closely followed by fall from same level with 20%. Collapse of scaffold was ranked third with 15%. Injury from equipment, slip and trip, struck by moving object and collapse of building or part of it were ranked the least. The complexity and nature of construction activities increases the chances of frequent accidents on site. The research has shown that the study also reveals a strong relationship between the cost of accident and the building construction cost. There is a positive correlation between both variables. There is also a positive relationship between accident cost and the total cost of construction. The finding of this study reveals that accident cost increases the cost of building construction.

In conclusion, construction site activities are associated with high physical labour. Despite the frequency of these accidents on site, safety of workers on all construction sites needs to be improved. From this study, the cost of accident prevention is lower than the cost of accident on site.

The study therefore recommends that the consequences of building construction site accidents have considerable impact on the total cost of building construction projects. It is also capable of undermining the reputation of construction companies. Construction managers should ensure that only properly trained workers should be involved in construction activities on site so as to curtail or minimise the occurrence of accidents. Training and continuous education of workers on safety precautions should be carried out periodically to minimise construction site accidents. Contractors must keep accident registers on sites and keep record of all kinds of accidents from minor bruises to major and fatal accidents. This will enable the management keep track of the safety of works and improve in areas where accident continues to reoccur. Costs for Personal Protective Equipment's measures should be explored and explicitly be part of tendering and costing for the project implementation.

Reference

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- Abdelhamid, T.S and Everett (2000). Identifying Root Causes of Construction Accidents. *Journal of Construction Engineering and Management*. 126 (1): 52-60.
- Abdul, R.A.H and Muhammed, Z.A.M (2008). Causes of Accidents at Construction Sites. *Malaysian Journal of Civil Engineering*. 20 (2): 242-259.
- Abubakar, B.M. (2015). Assessment of Cost Implication in Health and Safety on Construction Projects. *American Journal of Engineering Research*. 4(3): 25-30.
- Adeogu, B.K. (2013). Occupational Health and Safety Environment Trend in Nigeria. *Journal of Environmental Science and Management and Engineering Research*. 24-29.
- Agwu, M.O. and Enoh, O.H. (2014). Fatalities in the Nigerian Construction Industry. *British Journal of Economics, Management and Trade*. 4 (3): 431-452.
- Agwu, M.O and Olele, H.E. (2014). Poor Safety Culture in Nigeria Construction Industry. *British Journal of Economics, Management and Trade*. 4 (2): 331-341.
- Ali, A.S, Kamaruzzaman, S.N and Sing, G.C (2010). A Study on the Causes of Accidents and Prevention in Malaysian Construction Industry. *Journal of Design and Build*. 3: 95-103.
- Al-Kilan, F.M. (2011). Improving Safety Performance in Construction Projects in Libya. (Case Study: in Tripoli City) MSc. Thesis, Diponegoro University. Retrieved from <https://core.ac.uk/download/pdf/11728574.pdf>
- Ammy, U. and Sritomo, A. (2015). Accident Prevention and Causes. *Journal of Safety Research*. 44 (2): 115-123.
- Aniekwu, N. (2007). Accidents and Safety Violation in Nigerian Construction Industry. *Journal of Science and Technology*. 27 (1): 81-89.
- Asanka, W.A and Ranasinghe (2015). *Study on the Impact of Accidents on Construction Project*. International Conference on Structural Engineering and Construction Management. Kondi, Sri Lanka. 4: 58-67.
- Babbie, E. and Mouton, J. (2003). The Practice of Social Research. *Open Journal of Social Sciences* 5(8): 36-48.
- Bashir, A.M. (2013). A Framework for Utilising Lean Construction Strategies to Promote Safety on Construction Sites. *Journal of Social and Behavioural Sciences*. 101 : 90-99
- Binch, S. and Bell, J. (2007). The Cost of Non-Injury Accidents in the United Kingdom. *Health and Safety Labouratory*. Retrieved from <http://www.hse.gov.uk/research/rrhtm/rr585.htm>.
- Bruno, L.T and Anigbogu, N.A. (2012). The use of Personal Protective Equipment (PPE) on Construction Sites in Nigeria. *4th WABER Conference in Abuja*. 1341-1348.

African Scholar Publications and Research International

Proceedings of the 21st Multidisciplinary Academic Conference on Transformation Agenda for Third World Communities: Multidisciplinary Approach. (Vol. 21, No. 1) 30th April, 2020- 1000 Capacity Hall, Abubakar Tafawa Balewa University, Yelwa Campus ATBU, Bauchi, Bauchi State, Nigeria.

- Charles, M.B., Fumeaux, C., Pillay, J., Thorpe, D., Castillo, C.P and Brown, K. (2007). Uptake of an OHS Code of Practice by Australian Construction Firms. CIB World building conference. 093:1238-1251.
- Cook, T. and Lingard, H. (2011). A Retrospective Analysis of Work-related Deaths in the Australian Construction Industry. *Construction Economics and Building*. 15(2): 1-12
- De Vos, A.S., Straydom, H., Fouche, C.B., Delport, C.S.L. (2002). Dangerous Work and the Value of Human Life. *Social Science and Human Service Professions*. Pretoria Van Schaik 3: 26-43
- Dodo, M. (2014). The Application of Health and Safety Plan in Nigerian Construction Firms. *Jordan Journal of Civil Engineering*. 8 (1): 81-87.
- Donaghy, R. (2009). One Death Too Many. Inquiry into the Underlying Causes of Construction Fatal Accidents. www.dwp.gov.uk.
- Enobong, E. and Lewelyn, C.M. (2010). Death of Automation; the Consequences in Nigerian Construction Industry. *School of Construction Management and Engineering*, University of Reading, UK. 1-7
- Eppenberger, M. and Haupt, T.C. (2003). The Older Construction Worker. A Study of Injuries and their Underlying Causes. *Acta Structillia* 12(1): 1-19
- Espluga, J. (2004). An Approximation of the Costs of Industry Accidents and Illnesses in Spain. Trade Union Confederation of Workers Commissions. Department of Sociology. *Spain Publication*. 12 (4): 112-121.
- Eurostat (2004). Statistical Analysis of Socio-economic Costs of Accidents at Work in the European Union. *Final Report Luxembourg*. 115.
- Faith, Y. (2015). Monitoring and Analysis of Construction Site Accidents. *Journal of Sustainable Development*. 8 (2): 63-64.
- Farooqui, R.U. (2008). Safety Performance in Construction Industry of Pakistan. First International Conference on Construction in Developing countries, Karachi. 41-52.
- Fellows, R. and Lui, A. (2003). *Research Methods for Construction*. Wiley Publication 2nd Edition.
- Fewings, P. (2013). *Construction Project Management*. An Integrated Approach. 2nd Edition
- Foad, M.A. (2011). Improving Safety Performance in Construction Project in Libya. *International Journal of Engineering*. 26:109-113.
- Gaur, A.S. and Gaur, S.S. (2006). *Statistical Methods for Practice and Research*. A guide for Analysis Using SPSS. Sage Publication.
- Gavious, A. (2009). Occupation Safety and Health in the Construction Industry. *African Journal of Governance and Development*. 6(1):51-71.

African Scholar Publications and Research International

Proceedings of the 21st Multidisciplinary Academic Conference on Transformation Agenda for Third World Communities: Multidisciplinary Approach. (Vol. 21, No. 1) 30th April, 2020- 1600 Capacity Hall, Abubakar Tafawa Balewa University, Yelwa Campus ATBU, Bauchi, Bauchi State, Nigeria.

- Gibb, AG.F., Haslaw, R.A, Hide, S., Gyi, D.E. and Duff, A.R. (2006). Why Accidents Happen. *Journal of Civil Engineering*. 159(6):46-50
- Griffith, A. and Howarth, T. (2001). *Construction Health and Safety Management*. Routledge Publication.
- Hale, A. and Walker, N. (2012). Developing the Understanding of Underlying Causes of Construction Fatal Accidents. *Safety Science Journal*. 50: 2020-2027.
- Hinze, J. (1992). The High Cost of Construction Injuries. *Concrete Construction. Centre for Excellence in Construction Safety*. 4(1):456-464.
- Hinze, J. (2006). Construction Safety. *Journal of Construction Engineering and Management*. 132(2):164-172.
- Hossenian, S.S. and Torghabeh, Z.J. (2012). Major Theory of Construction Accident Causation Models. *International Journal of Advance Engineering*. 111:1-14
- HSE, (2009). *Construction Workers Challenges*.
www.hse.gov.uk/statistics/sourcess.htm
- HSE, (2017). *Cost of Workplace Fatalities and Self Reported Injuries and Ill Health*.
www.hse.gov.uk
- Ibrahim, D.A. (2014). An Investigation into Risk Factors and Preventive Measures in Building Construction Projects in Abuja. *International Journal of Scientific and Research Publication*. 4(7):1-6.
- Idoro, G.I. (2007). A Comparative Evaluation of Health and Safety Performance of Indigenous and Multinational Construction Firms in Nigeria. *University of Lagos*. 1(1): 65-75.
- Idoro, G.I. (2008). Health and Safety Management Effects as Correlates of Performance in the Nigerian Construction Industry. *Journal of Civil Engineering and Management*. 4 (1): 277-285.
- Idoro, G.I. (2011). Effect of Mechanisation on Occupational Health and Safety Performance in the Nigerian Construction Industry. *Journal of Construction in Developing Countries*. 16 (2): 27-45.
- International Labour Organisation (2008). *Report on the National Occupational Safety and Health Information Centre*. www.ilo.org.
- Jallon, R.,Inhean, D. and De Marcellis- Warin, N. (2011). Development of Indirect Cost Calculation Model Suitable for Workplace Use. *Journal of Safety Research*. 42 (3):149-164.
- Kadiri, Z.O. (2014). Causes and Effects of Accidents on Construction Sites- A Case Study of Some Selected Firms in Abuja. *Journal of Mechanical and Civil Engineering*. 11 (5): 66-72.
- Koehn, E.K. (1995). Safety in Developing Countries. *Journal of Construction Engineering and Management*. 121 (3): 261-265.

African Scholar Publications and Research International

Proceedings of the 21st Multidisciplinary Academic Conference on Transformation Agenda for Third World Communities: Multidisciplinary Approach. (Vol. 21, No. 1) 30th April, 2020- 1000 Capacity Hall, Abubakar Tafawa Balewa University, Yelwa Campus ATBU, Bauchi, Bauchi State, Nigeria.

- Kolo, D.N. (2015). Safety Issues Involving Workers on Building Construction Sites in Nigeria. Eastern Mediterranean University Institutional Repository.1-118
- Lingard, H. and Rowlinson, S. (2004). *Occupational Health and Safety in Construction Project Management*. Hong Kong:Taylor and Francis Publication.
- Maina, S.M. (2012). *Qualitative and Quantitative Research Methods Simplified*. Nairobi, Kenya: Mount Kenya University Press.
- Mba, H.C. (2004). *Management of Environmental Problems and Hazards in Nigeria*. London: Routledge Publication.
- Mbamali, I. (2012). An Assessment of the Threats and Opportunities of Globalisation on Building Practices in Nigeria. *American International Journal of Contemporary Research*. 2(4): 24-26.
- Mbuya, E. and Lema, N.M. (1996). Towards Development of a Framework for Integration of Safety and Quality Management Techniques in Construction Project Delivery Process. *International Journal of Quality*. 14(5):1-15.
- Molenaar, K. (2002). Cooperate Culture A Study of Firms with Outstanding Construction Safety. *Professional Safety Journal*. 47(7):113-118.
- Okojie, O. (2010). Systems for Reporting Occupational Diseases in Nigeria. African Newsletter on Occupational Health and Safety. 20:51-53
- Okeola, O.G. (2009). Occupational Health and Safety Assessment in the Construction Industry. *First Annual Civil Engineering Conference*. University of Ilorin, Nigeria. 236-243.
- Okoye, P.U. (2010). The Influence of National Culture on Workers Safety Climate in the Nigerian Construction Industry. *British Journal of Environmental Science*. 2(1):21-33.
- Olatunji, O.A. and Aje, O.I. (2005). Evaluating Health and Safety Performance of Nigerian Construction Site. *CIB World Building Congress*. 51:1176-1190.
- Olutuase, S.O. (2014). A Study of Safety Management in the Nigerian Construction Industry. *Journal of Business and Mangement*. 16 (93): 1-10.
- Samuel, L. (2010). *Health and Safety on Construction Sites in Ghana*. Dauphine University Paris. Cobra. 1-19.
- Schafer, D., Abdelhamid, T.S., Mitropoulos, P., Howell, G.A. (2008). Resilience Engineering. A New Paradigm for Safety in Lean Construction Systems. 16th International Group for Lean Construction Annual Conference. 103:723-733
- Sejas,W.I. (2014). Safety Behaviours in the Construction Industry. *International Journal of Built Environment and Sustainability*. 6(1):14-22.
- Sun, A.R. (2010). *Accidents on the Construction Sites*. CIB World Building Congress Salford, United Kingdom.
- Sun, L., Paez, O., Le, D., Salem, S., Daraiseh, N.M. (2005). Theoretical Issues in Ergonomics Science. *Journal of Industrial and Manufacturing Engineering*. 9(5):119-125.

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Proceedings of the 21st Multidisciplinary Academic Conference on Transformation Agenda for Third World Communities: Multidisciplinary Approach. (Vol. 21, No. 1) 30th April, 2020- 1000 Capacity Hall, Abubakar Tafawa Balewa University, Yelwa Campus ATBU, Bauchi, Bauchi State, Nigeria.

- The Punch (2005). Occupational Health and Safety Association on Construction Industry. July 25.
- Uchenna, K.P. (2010). Improving the Safety of Performance of the Nigerian Construction Workers. *Universal Journal of Engineering*. 4 (2): 22-37.
- Welman, J.C and Kruger, S.J. (2001). Research Methodology for Business and Administration Sciences. *Journal of Industrial Psychology*. 26(1)1-312.
- Zaynab, A.B. (2012). Safety Culture of Nigerian Construction Workers. A Case Study of Yola. *Journal of Scientific and Engineering Research*. 3(9)212-218.