



NIGERIAN INSTITUTE OF  
QUANTITY SURVEYORS:  
FIRST ANNUAL RESEARCH  
CONFERENCE - AnReCon

3<sup>rd</sup> to 5<sup>th</sup> September 2013

*THEME: Innovative and Sustainable Management  
of Building and Infrastructure Projects*



**Edited by:**

Dr. Ahmed D. Ibrahim

Dr. Kulomri J. Adogbo

Dr. Yahaya M. Ibrahim

Proceedings of the 1<sup>st</sup> Annual Research Conference (AnReCon) of the Nigerian Institute of Quantity Surveyors

Editors:       Dr. Ahmed D. Ibrahim  
                  Dr. Kulomri J. Adogbo  
                  Dr. Yahaya M. Ibrahim

Published by: The Nigerian Institute of Quantity Surveyors

3<sup>rd</sup> to 5<sup>th</sup> September, 2013

ISBN: 978 – 978 – 934 – 446 – 8

© Nigerian Institute of Quantity Surveyors, 2013

**Declaration**

All the papers in this publication went through a double-blind peer-review process involving initial screening of abstracts, review by at least two referees, reporting of comments to authors, modifications of papers by authors and re-evaluation of re-submitted papers to ensure quality of content.

# TABLE OF CONTENTS

## KEYNOTES:

**KEYNOTE PAPER 1: INNOVATIVE AND SUSTAINABLE MANAGEMENT OF QUANTITY SURVEYING PRACTICES.....** ERROR! BOOKMARK NOT DEFINED.

**KEYNOTE PAPER 2: RESEARCH AND DEVELOPMENT IN QS PROFESSION - NIGERIA SCORECARD.....** ERROR! BOOKMARK NOT DEFINED.

**KEYNOTE PAPER 3: QUANTITY SURVEYING EDUCATION- STATUS REPORT ON NIGERIA.....** ERROR! BOOKMARK NOT DEFINED.

## **THEME 1 - COST & VALUE MANAGEMENT ..... 30**

AN APPRAISAL OF WHOLE LIFE COSTING CONCEPTS IN NIGERIAN CONSTRUCTION INDUSTRY ..... ERROR! BOOKMARK NOT DEFINED.

AN EVALUATION OF FACTORS INFLUENCING THE COST OF HIGHWAY CONSTRUCTION IN NIGERIA ..... ERROR! BOOKMARK NOT DEFINED.0

APPRAISAL OF MODERN COST MANAGEMENT TECHNIQUES IN THE NIGERIAN CONSTRUCTION INDUSTRY ..... ERROR! BOOKMARK NOT DEFINED.8

AUTOMATING THE COMPUTATION OF UNIT RATES FOR BUILDING COST ESTIMATING ..... ERROR! BOOKMARK NOT DEFINED.8

BUILDING INFORMATION MODELLING (BIM): A SUMMARY OF SOME UK EXPERIENCES AS GUIDE TO ADOPTION IN NIGERIA ..... 677

THE CHALLENGES OF DEVELOPING BIM-BASED MEASUREMENT STANDARD IN MALAYSIA.....80

INFLUENCE OF PRICES OF SELECTED BUILDING MATERIALS ON THE RATE OF HOUSING DEVELOPMENT IN MINNA (2003 - 2012) ..... 900

THE IMPACT OF CONTRACTORS' FINANCIAL CAPABILITY ON COST AND TIME PERFORMANCE OF CONSTRUCTION PROJECTS IN NIGERIA ..... 1044

## **THEME 2 - PROJECT & CONSTRUCTION MANAGEMENT..... 10909**

AN APPRAISAL OF FACTORS AFFECTING THE PERFORMANCE OF CONSTRUCTION PROJECTS IN NIGERIA..... 109

AN APPRAISAL OF RISK MANAGEMENT IN SMALL AND MEDIUM-SIZED CONSTRUCTION PROJECTS IN NIGERIA ..... 1200

AN ASSESSMENT OF RISK MANAGEMENT PRACTICES IN THE EXECUTION OF CONSTRUCTION PROJECTS IN NIGERIA..... 127

CONFLICT EARLY WARNING SIGNALS IN THE EXECUTION OF CONSTRUCTION PROJECTS ..... 138

EFFECTS OF INEFFECTIVE COMMUNICATION ON PROJECT DELIVERY IN NIGERIAN CONSTRUCTION INDUSTRY ..... 147

PRINCIPLE OF BENCHMARKING AS A MEANS FOR IMPROVING QUALITY IN THE NIGERIA CONSTRUCTION INDUSTRY .....	156
PRIORITIZATION OF FACTORS AFFECTING CONSTRUCTION TIME OF BUILDING PROJECTS IN NIGERIA.....	169
<b>THEME 3 - TECHNOLOGY, PRODUCTIVITY, HEALTH &amp; SAFETY .....</b>	<b>181</b>
AN ASSESSMENT OF FIRE SAFETY PROVISIONS IN HOSPITAL BUILDINGS IN JOS MUNICIPAL .....	182
AN ASSESSMENT OF HEALTH AND SAFETY MANAGEMENT OF BUILDING AND INFRASTRUCTURE PROJECTS IN SOUTH EAST GEO-POLITICAL ZONE .....	190
CHEMICAL AND MECHANICAL PROPERTIES OF OIL PALM SHELL IN THE DESIGN AND CONSTRUCTION OF A PRECAST CONCRETE BENCH.....	199
DETERMINATION OF CONSTRUCTION LABOUR OUTPUTS ON TERRAZZO FLOOR FINISH.....	210
EVALUATING THE STRENGTH OF BAGASSE ASH AS FILLER IN HOT MIX ASPHALT DESIGN.....	218
IMPROVING CONSTRUCTION PRODUCTIVITY ON BUILDING AND REAL ESTATE CAPITAL PROJECTS IN NIGERIA .....	229
NIGERIAN NATIONAL ANNEX TO EUROCODE5: AN ECONOMICAL OPTION FOR THE DEVELOPMENT OF NIGERIAN DESIGN STANDARD FOR TIMBER BUILDINGS .....	237
RESEARCH AND LEGAL UNDERPINNINGS OF THE QUANTITY SURVEYOR AS A HEALTH AND SAFETY MANAGER.....	243
<b>THEME 4 - CONSTRUCTION PROCUREMENT .....</b>	<b>253</b>
A REVIEW OF SUSTAINABLE PROCUREMENT OPTION FOR BUILDING CONSTRUCTION PROJECTS.....	254
AN APPRAISAL OF RISK RESPONSE TECHNIQUES USED BY PUBLIC PRIVATE PARTNERSHIP PARTICIPANTS IN NIGERIA .....	265
AN ASSESSMENT OF THE THERAPEUTIC PERFORMANCE OF TEACHING HOSPITALS IN NORTH-WESTERN NIGERIA .....	271
EFFECTS OF CONSTRUCTION RISK MANAGEMENT ON TIME, COST AND QUALITY OF CONSTRUCTION PROJECTS .....	285
EVALUATING LESSONS LEARNED PRACTICES (LLP) IN PUBLIC PRIVATE PARTNERSHIP (PPP) PROJECTS IN NIGERIA.....	294
EVALUATING METHODS OF DELIVERING SUSTAINABLE CONSTRUCTION IN THE NIGERIAN CONSTRUCTION INDUSTRY .....	303
INVESTIGATING DRIVERS AND BARRIERS FOR ADOPTING COLLABORATIVE PROCUREMENT STRATEGIES IN THE NIGERIAN CONSTRUCTION INDUSTRY .....	315
<b>THEME 5 - PROFESSIONAL PRACTICE .....</b>	<b>328</b>

A FRAMEWORK FOR ASSESSING QUANTITY SURVEYORS' COMPETENCE .....	329
ALGORITHM FOR SPECIFICATION WRITING TO IMPROVE THE QUALITY OF BUILDING CONSTRUCTION IN NIGERIA.....	344
AREAS OF COMPETENCIES OF QUANTITY SURVEYORS AND THEIR RELEVANCE TO VALUE MANAGEMENT DISCIPLINE .....	359
EXTENUATING COMMUNITY PROTEST IN "CONTROVERSIAL PROJECTS" SCENARIOS IN THE NIGER DELTA: A CASE FOR CORPORATE SOCIAL RESPONSIBILITY (CSR) .....	369
LEAN CONSTRUCTION PRACTICE AND THE CHALLENGES IN NIGERIA.....	380
SUCCESS STRATEGIES OF WOMEN IN CONSTRUCTION PRACTICE IN NORTHERN NIGERIA .....	388
THE PLACE OF MATHEMATICAL MODELLING IN QUANTITY SURVEYING RESEARCH AND DEVELOPMENT .....	401
UNETHICAL PROFESSIONAL PRACTICES IN THE MANAGEMENT OF CONSTRUCTION PROJECTS IN NIGERIA .....	410
<b>THEME 6 - CONSTRUCTION ECONOMICS &amp; PROJECT FINANCING.....</b>	<b>419</b>
A COMPARATIVE STUDY OF IMPACT OF FOREIGN DIRECT INVESTMENT (FDI) ON CONSTRUCTION SECTOR IN NIGERIA DURING MILITARY REGIME AND DEMOCRATIC GOVERNMENT .....	420
A REVIEW OF CHALLENGES OF A LIBERALIZED ECONOMY ON THE CONSTRUCTION INDUSTRY IN NIGERIA .....	427
ASSESSMENT OF THE CHALLENGES FACING THE INFLOW OF FOREIGN DIRECT INVESTMENT (FDI) INTO CONSTRUCTION SECTOR IN NIGERIA.....	438
ANALYSIS OF RISK FACTORS OF PUBLIC PRIVATE PARTNERSHIPS: COMPARISON OF NIGERIA AND NIGER REPUBLIC .....	445
DEVELOPMENT OF FRAMEWORK FOR ASSESSING VALUE FOR MONEY OF PUBLIC-PRIVATE PARTNERSHIP (PPP) PROJECTS IN NIGERIA.....	456
FOREIGN PRIVATE INVESTMENTS (FPI) TRENDS IN CONSTRUCTION AND RELATED SECTORS OF NIGERIA .....	465
PERFORMANCE OF ADVANCE PAYMENT BOND IN CONSTRUCTION PROJECTS....	478
<b>INDEX OF KEYORDS .....</b>	<b>487</b>
<b>INDEX OF AUTHORS .....</b>	<b>489</b>

## INDEX OF AUTHORS

- Abdulrazaq, 48, 210  
Abdulsalam, 182  
Abiola, 182  
Adamu, 90, 271  
Adedokun, 104  
Adindu, 138, 380  
Adogbo, 48, 111, 388  
Agbai, 58  
Agha, 190  
Ahmadu, 169  
Ahmed, 218  
Aje, 104, 420, 438, 478  
Akpokodje, 199, 229  
Aliyu, 237  
Anigbogu, 344  
Anunike, 344  
Awodele, 147, 420, 438  
Baba, 243  
Bello, 30, 265, 456  
Bima, 243  
Buba, 285  
Chindo, 210, 445  
Chitumu, 465  
Dada, 329  
Dahiru, 237  
Danazumi, 237  
Dandajeh, 271  
Diugwu, 243  
Ebekozi, 420, 438  
Ekung, 369  
Fabi, 40  
Faruk, 315  
Gandu, 254  
Ganiyu, 156  
Ibironke, 104  
Ibrahim, 27, 30, 80, 169, 265, 271, 294, 315, 388, 410, 445, 456  
Iliya, 445  
Ishaya, 111  
Jagafa, 456  
Jagboro, 329  
Jagboro, 20  
James, 285  
Jatau, 285, 303  
Jeffery, 67  
Jegede, 218  
Kaura, 237  
Kevin, 465  
Kolo, 30  
Mbamali, 254  
Midala, 265  
Morakinyo, 478  
Mshelgaru, 271  
Mohammed, 80  
Muhammad, 445  
Munir, 67  
Murana, 218  
Nnadi, 127  
Nwoko, 156  
Ofide, 401  
Ogboji, 369  
Ogunsemi, 14, 478  
Ojo, 427  
Oke, 478  
Okonkwo, 369  
Okore, 138  
Okpan, 190  
Olowa, 80  
Olowosulu, 218  
Onyele, 58  
Osadola, 147  
Oyeniyan, 90  
Robinson, 138  
Sarki, 182  
Shehu, 90  
Shittu, 90  
Udugh, 465  
Ugulu, 199, 229  
Umar, 156  
Yusuf, 48, 80  
Zaki, 303  
Zarewa, 294  
Zubairu, 254

*NIQS*

*ANReCon 2013*

**ISBN: 978 – 978 – 934 – 446 – 8**

**© Nigerian Institute Of Quantity Surveyors, 2013**

# RESEARCH AND LEGAL UNDERPINNINGS OF THE QUANTITY SURVEYOR AS A HEALTH AND SAFETY MANAGER

I.A. Diugwu, D.L. Baba and A.M Bima

*Department of Project Management Technology, Federal University of Technology, Minna, Nigeria*

## ABSTRACT

Although the construction industry is a risky one with its average rate and severity of injuries and fatalities higher than most other sectors, it is, nonetheless, a major contributor to the economic growth of countries. Although in the advanced and developed economies, measures have been put in place to minimise rate and severity of accidents in the construction sector, the same cannot be said of Nigeria, with identified poor health and safety awareness, regulation and management. As a result, improvements in health and safety management in the Nigerian construction sector cannot be achieved through the regulatory route, but rather through the influence of project stakeholders. It then recommended that the Quantity Surveyor (QS) as an important stakeholder in the construction sector should begin to champion good health and safety management ethics in the construction industry.

**Keywords:** construction, designers, economic growth, health and safety management, quantity surveyor.

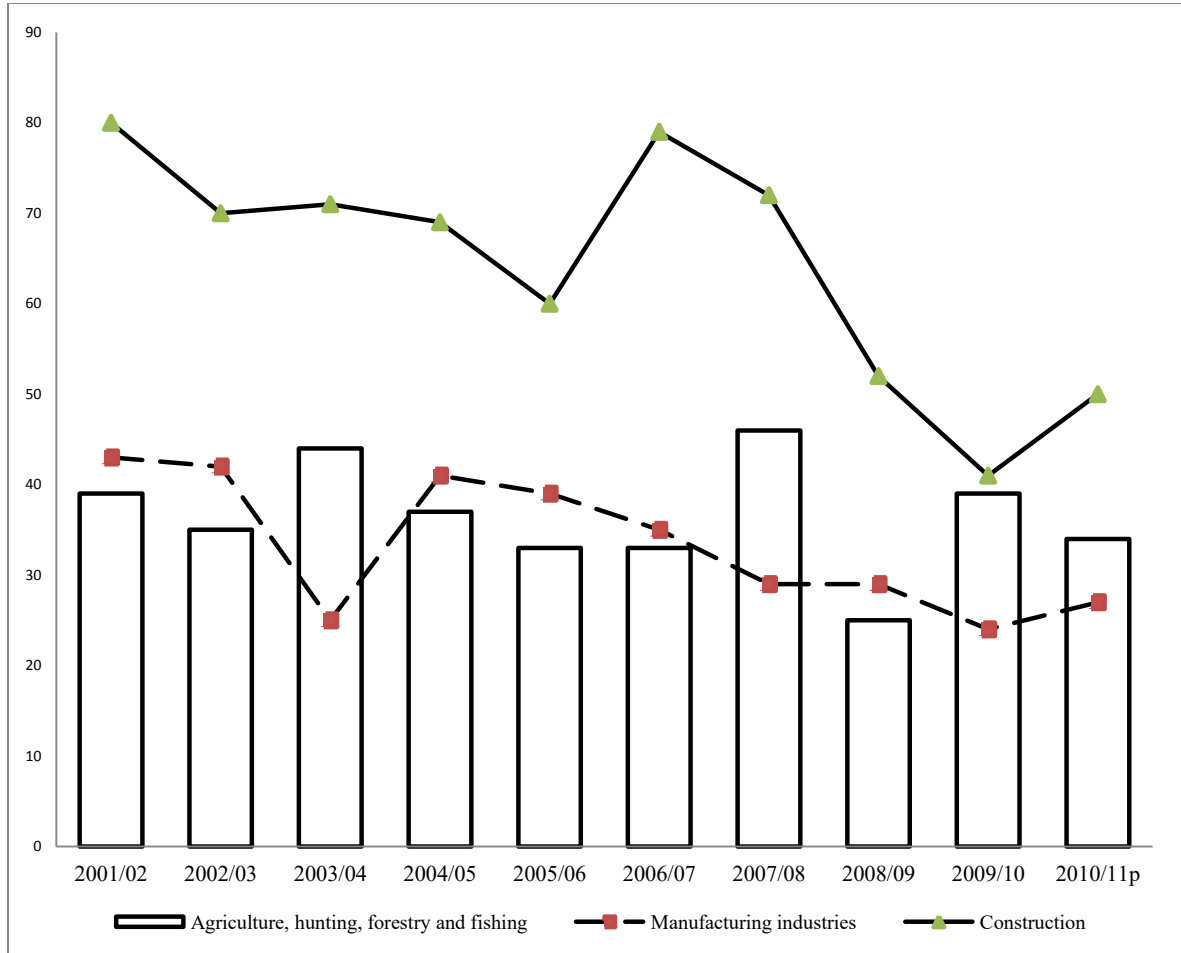
## INTRODUCTION

The construction industry plays a vital role in the economic growth and stability of nations through employment generation (Sharp, 2010), contributions to national account (Dye and Sosimi, 2010), gross domestic product (GDP) and fixed capital growth (Olatunji and Bashorun, 2006). In spite of these contributions, there are observations that the construction industry is under-performing in some areas (Egan, 1998), notably, health and safety - a key performance indicator in the construction industry (Department for Business Enterprise and Regulatory Reform, 2007). Although Figure 1 below shows that there have been steady improvement in the construction health and safety statistics in some countries, the frequency and severity of these occurrences are still higher than in most other sectors (Health and Safety Executive, 2005).

The impact of accidents and injuries on the performance of the construction industry has been highlighted for instance by the International Labour Organization (2010) which observes that there are about 6,300 fatalities per day, more than 330 million occupational accidents and work-related diseases every year, with an estimated financial cost that corresponding to about 4% of annual global gross domestic product (GDP). With specific reference to the UK, the Health and Safety Executive (2012) indicates that accidents in the construction sector accounts for 27% of fatal injuries, 9% of reported



major injuries, and 6% of over 3-day injuries to employees. It also impacts on the activities of construction industries due to disruptions high percentage of prohibitions and notices (Health and Safety Executive, 2004). In Rushton *et al.* (2012), a link between construction activities and occupational cancer deaths and cancer registrations was established.



**Figure 1: Fatal injuries to all workers 2001/02 - 2010/11p (Source: Health and Safety Executive (2012))**

Several factors are responsible for the poor safety standard of the industry. Inference from literature is that certain management practices in the construction industry, which seems to encourage rivalry, and ‘sitting on’ vital information, contribute substantially. But beyond this, there are observations that the undue emphasis (even in the selection of contractors) placed on price instead of quality is responsible (Johnston and Lawrence, 1988; Lingard and Holmes, 2001). This is closely associated with the market based type of relationship in the industry which some see as being responsible for the poor safety standard in the industry (Winch, 2002). In consideration of the above, this paper subscribes to the view that poor health and safety performance of the industry over the years could be attributed to the nature of activities carried out in the sector (Recio *et al.*, 2006). It shall go further to show that although certain aspects of supply chain

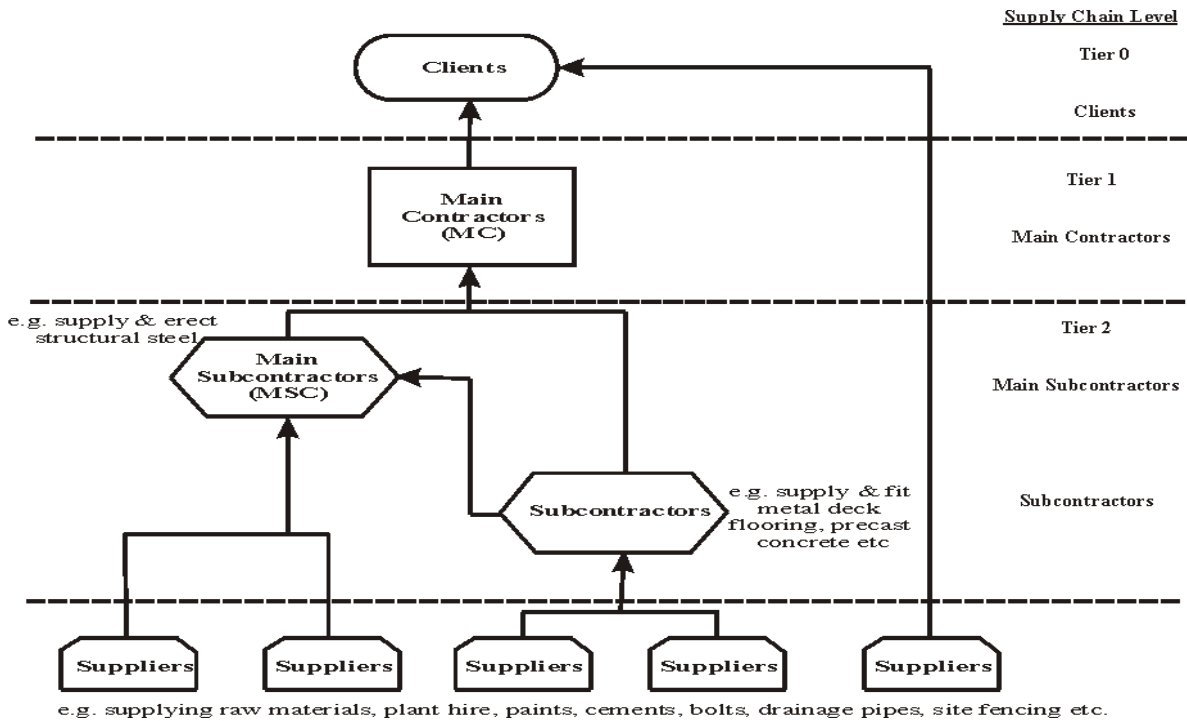
management (SCM) practices (e.g. subcontracting) can lead to poor health and safety standard, some other aspects of SCM (for instance, adequate engagement of project stakeholders such as Quantity Surveyors) can be effective improvement tools.

## **LITERATURE REVIEW**

### **Construction supply chain network and management**

According to London and Chen (2006), a construction supply chain (Figure 2) describes a group of firms linked through upstream and downstream contractual relationships, for the purposes of delivering product(s) and/or services) related to the core business of a construction project, with an associated flow of commodities, cash and information. Dainty *et al.* (2001) note that a construction supply chain is fragmented, with the contractor-subcontractor relationship often affected by the transactional power of the contractor and an undue focus on costs rather than value by the contracting organisation. Fragmentation, according to El-Sheik and Pryke (2010) affects the efficiency of the chain by making integration, cooperation and collaboration among stakeholders difficult (Abd Shukor *et al.*, 2011). There is also a reduction in trust (Morledge *et al.*, 2009), and inefficient information sharing and learning (Vrijhoef and Ridder, 2005). Invariably, the above factors impact negatively on performance (London, 2005) due to insufficient resources and a dearth of competence (Fenna, 2004) caused by a restriction on knowledge sharing, learning, and collaboration. Dave and Koskela (2009) see the industry as a highly projectized one, and this has a negative effect on project delivery efficiency of the industry (Evbuomwan and Anumba, 1998).

Several works have discussed specific impact of these factors on the performance of the industry (Tummala *et al.*, 2006; Abd Shukor *et al.*, 2011; London and Chen, 2005), and how these associated problems could be addressed (Lambert and Cooper, 2000; Fernie and Thorpe, 2007).



**Figure 2: Construction supply chain (Source: Beach et al., 2005, p. 612)**

### **Relating accident statistics and management with characteristics of the industry**

The immediate major causes of accidents in the construction industry are slips and trips; collapses; drowning/asphyxiation; electricity and explosions; falls from roofs, scaffolds and ladders; falling objects and material; transportation equipment (e.g. excavators and dumpers); and excavation work (Helander, 1991; Health and Safety Executive, 2012, 2006). However, the remote causes have been given as the nature of, and management practices adopted in the industry (Dave and Koskela, 2009); its trade-based nature (Winch, 2002), viewed as highly fragmented and adversarial (El-Sheik and Pryke, 2010). According to Health and Safety Commission (2003), these characteristics contribute to the industry's accident statistics by promoting price competition among contractors, thus giving undue advantage to companies with poor health and safety standards. Furthermore, Egan (1998) as well as Mayhew and Quinlan (1999) believe that subcontracting, including an intensification of the use of contractual arrangements have negatively influenced accident statistics of the sector, probably due to increase conflicts and price competition due caused mainly by the difficulties inherent in the management of these relationships. Hope (1999) links the higher incident rates accounted for by contractors to difficulties in assigning responsibilities, occasioned by coordination and communication challenges due to poor relationship management.

Again, the construction industry is dominated by small and medium enterprises (Edum-Fotwe *et al.*, 1999; Dainty *et al.*, 2001), which are known to have peculiar challenges with health and safety management (Diugwu, 2008). For instance, companies in this band

are 'hard to reach' (Fonteyn *et al.*, 1997), often unwilling to liaise with safety regulators on matters relating to health and safety (Lefebvre, 1997; Borley, 1997) out of fear of being punished for poor safety performance. The poor safety record has been aggravated by the implementation of poorly designed, targeted and implemented improvement initiatives (Rhodes and Carter, 2003). As such, the suitability of improvement strategies (Bibbings, 2003) that rely on the coercive forces of regulation (Smallwood, 1998) has been questioned. Earlier studies had advocated strategies that rely on customer requirements or supply chains influences as better alternatives (Diugwu, 2008; Diugwu, 2011); especially in Nigeria where glaring inefficient health and safety management regulation, low awareness and poor management contribute to poor safety standards (Ayininuola and Olalusi, 2004; Idoro, 2004; Idoro, 2008; Diugwu *et al.*, 2012).

### **Quantity Surveyor as a Health and Safety Manager**

In consideration of the impact of accidents on the productivity of the construction industry, many countries have established regulations aimed at ensuring safer work environment. The Construction regulations are thus, statutory instruments which set out the minimum legal health and safety requirements expected during any construction activity (Chudley and Greeno, 2006). In the United Kingdom, there is the Construction (Design and Management) Regulations, 2007 (CDM, 2007), while in South Africa there is the Construction Regulations, 2003. Although a National Building Code capable of proffering solutions to the hazardous trends in the building construction industry has been accorded a legal status in Nigeria, the enforcement however remains a daunting task throughout the country (Mbamali and Okotie, 2012). And this is negatively impacting on efficient construction site management in Nigeria. For instance, Jimoh (2012) establishes that inadequate enforcement of existing enabling building regulations such as the National Building Code 2006, ranked number one among problems associated with site management in Nigeria. An analysis of the CDM Regulation 2007 shows that its focus is on integrating health and safety into the management of projects with a view to an early identification of risks, and the provision of targeted efforts that would not enhance health and safety, but also minimize the level of bureaucracy. Both the CDM Regulation 2007 of UK and the Construction Regulations 2003 of South Africa place specific health and safety responsibilities on the designer, whom the Health and Safety Executive (2007) describes as one who prepares design drawings, specifications, bills of quantities and the specification of articles and substances; for instance, a quantity surveyor. The level of responsibility placed upon clients and designers have been acknowledged (Smallwood and Haupt, 2006).

Apart from the statutory powers accorded to the quantity surveyor as outlined above, the Quantity Surveyor, of whom the Nigerian Institute of Quantity Surveyors (2004) sees as an expert who is professionally trained and experienced in construction cost, management and communication, is in a vantage and privileged position to drive forward construction industry health and safety improvement initiatives in Nigeria due to his relationship with the owners and as well as executors of constructors projects. Furthermore, the Quantity

Surveyor's training and practice have cumulatively enhanced his/her knowledge of, ability and skills needed for efficient site management as outlined in (Obiegbu, 2012)

## **CONCLUSION AND RECOMMENDATION**

This paper has established the contribution of the construction industry to economic growth of nations; but the prevalently higher rates and severity of accidents in the sector constitutes a threat to this. Globally, the nature of the industry is such that it is dominated by small to medium enterprise organisations, known to have peculiar health and safety management challenges. Consequently, the reliance on the traditional regulatory approach to management and improvement of safety in the sector would not be effective. Locally, there is poor health and safety regulation in Nigeria.

In cognizance of the strategic role of the Quantity Surveyor from the conception to the close-out of construction projects, as well as the statutory powers bestowed on the quantity surveyor concludes that the Quantity Survey occupies both a vantage and privileged position and is best placed to drive health and safety management in the construction industry forward. This could be achieved by ensuring the adequate provisions for health and safety are made in the bill of quantities, and as a project manager, that these are adhered to strictly.

## **REFERENCES**

- Abd Shukor A S, Mohammad M F, Mahbub R and Ismail F (2011). Supply chain integration in industrialised building system in the Malaysian construction industry *The Built & Human Environment Review* **4** 108-21
- Ayininuola, G. M. and Olalusi O. O. (2004). Assessment of building failures in Nigeria: Lagos and Ibadan case study *African Journal of Science and Technology (AJST)* **5** 73-8
- Bibbings, R. (2003). Strategy for meeting the occupational safety and health needs of small and medium size enterprises (SMEs) - a summary of RoSPA's views *Safety Science Monitor* **7**
- Borley, J. (1997). A health and safety system which works for small firms *Journal of the Royal Society for Health* **117** 211-5
- Chudley, R. and Greeno, R. (2006) *Building construction handbook* (USA: Butterworth-Heinemann)
- Dainty, A. R. J., Briscoe, G. H. and Millett, S. J. (2001). New perspectives on construction supply chain integration *Supply Chain Management* **6** 163-73

- Dave, B. and Koskela, L. (2009). Collaborative knowledge management - a construction case studies *Automation in Construction* **8** 894-902.
- Department for Business Enterprise and Regulatory Reform (2007). *Construction Statistics Annual* (London: TSO (The Stationery Office))
- Diugwu, I., Baba, D. and Egila, A. (2012). Effective Regulation and Level of Awareness: An Exposé of the Nigeria's Construction Industry *Open Journal of Safety Science and Technology* **2** 140-6
- Diugwu, I. A. (2008). A framework to evaluate critically the health and safety strategies in supply chains in the UK. In: *Mechanical/Manufacturing Engineering*: Coventry University, UK)
- Diugwu, I. A. (2011). Re-Strategizing for Effective Health and Safety Standards in Small and Medium-Sized Enterprises *Open Journal of Safety Science and Technology* **1** 115-28
- Dye, J. and Sosimi, J. (eds) (2010). *United Kingdom National Accounts - The Blue Book* (UK: Palgrave Macmillan)
- Edum-Fotwe, F. T., McCaffer, R., Thorpe, A. and Majid, Z. M. A. (1999). Sub-contracting or cocontracting: construction procurement in perspective. In: *2nd International Conference on Construction Industry Development, CIB TG 29*, National University of Singapore pp. 157-63
- Egan, T. (1998). Rethinking Construction. In: *The report by the Construction Task Force to the Deputy Prime Minister, John Prescott, on the scope for improving the quality and efficiency of the UK*, (UK
- El-Sheik, A. and Pryke, S. D. (2010). Network gaps and project success *Construction Management and Economics* **28** 1205-17
- Evbuomwan, N. F. O. and Anumba, C. J. (1998). An integrated framework for concurrent life-cycle design and construction *Advances in Engineering Software* **29** 587-59
- Fenna, A. (2004). *Australian Public Policy* (Frenchs Forest, NSW: Pearson Education)
- Fernie, S. and Thorpe, S. (2007). Exploring change in construction: supply chain management *Constructions and Architectural Management* **14** 319-33
- Fonteyn, P. N., Olsberg, D. and Cross, J. A. (1997). Small business owners' knowledge of their occupational health and safety (OHS) legislative responsibilities *International Journal of Occupational Safety and Ergonomics*, vol. 3, no. 1-2, pp. **3** 41-57
- Health and Safety Commission (2003). Health and safety statistical highlights 2002/03 (Norwich: Health and Safety Executive,)

- Health and Safety Executive (2004). Occupational ill health in the construction industry: statistical factsheet. Health and Safety Executive)
- Health and Safety Executive (2005). Health and safety offences and penalties, 2003/2004. (UK: 2005)
- Health and Safety Executive (2006). An analysis of the significant causes of fatal and major injuries in construction in Scotland. Research Paper 443, (London: Health and Safety Executive)
- Health and Safety Executive (2007). Managing Health and Safety in Construction - Construction (Design and Management) Regulations 2007 (CDM Regulations). In: *Approved Code of Practice - L144*, (UK: HSE Book)
- Health and Safety Executive (2012). Construction work related injuries and Ill health.
- Helander, M. G, (1991). Safety hazards and motivation for safe work in the construction industry *International Journal of Industrial Ergonomics* **3** 205-23
- Hope, C. (1999). The impact of procurement and contracting practices on health and safety – a literature review, HSL report RAS/99/02. HSE Books)
- Idoro, G. I. (2004). The effect of Globalization on Safety in the Construction Industry in Nigeria. In: *International Symposium on Globalization and Construction*, (School of Civil Engineering, Asian Institute of Technology, Bagdok, Thailand
- Idoro, G. I. (2008). Health and Safety Management Efforts as Correlates of Performance in the Nigerian Construction Industry *Journal of Civil Engineering and Management* **14** 277–85
- International Labour Organization (2010). Safety and Health at Work. International Labour Organisation)
- Jimoh, R. A. (2012). Improving Site Management Practices in the Nigerian Construction Industry: The Builders’ Perspective *the Ethiopian Journal of Environmental Studies and Management* **5** 366-72
- Johnston, R. and Lawrence, P. (1988). Beyond vertical integration: the rise of the value-adding partnership *Harvard Business Review* **66** 94-101
- Lambert, D. M. and Cooper, M. C. (2000). Issues in supply chain management *Industrial Marketing Management* **29** 65-83
- Lefebvre, R. C. (1997). “Social marketing” in: Health behaviour and health education: theory, research, and practice, 2ed, (Glanz, K. Lewis, F.M., and Rimer, B. K., Eds), Jossey-Bass: San Francisco 1997 *Health behaviour and health education: theory, research, and practice*, Ed K Glanz, *et al.* (San Francisco: Jossey-Bass)

- Lingard, H. and Holmes, N. (2001). Understandings of occupational health and safety risk control in small business construction firms: barriers to implementing technological controls *Construction Management and Economics* **19**
- London, K. (2005). Construction Supply Chain Modelling. In: *Faculty of Architecture, Building and Planning*: University of Melbourne)
- London, K. and Chen, J. (2005). Supply chain sustainability: Report 1 literature review. CRC for Construction Innovation, Icon.Net Pty Ltd)
- London, K. and Chen, J. (2006). Construction supply chain economic policy implementation for sectorial change: moving beyond the rhetoric. In: *Annual Research Conference of the Royal Institution of Chartered Surveyors*, (University College London the Royal Institution of Chartered Surveyors) pp. 1-10
- Mayhew, C. and Quinlan, M. (1999). The effects of outsourcing on occupational health and safety: a comparative study of factory-based workers and outworkers in the Australian clothing industry *International Journal of Health Services* **29** 83-107
- Mbamali, I. and Okotie, A. (2012). An Assessment of the Threats and Opportunities of Globalization on Building Practice in Nigeria *American International Journal of Contemporary Research* **2**
- Morledge, R. K. K and Grada, M. (2009) *Construction supply chain management concepts and case study*, Ed S Pryke (United Kingdom.: Wiley-Blackwell)
- Nigerian Institute of Quantity Surveyors (2004). Who is a quantity surveyor? What can he do for you! In: *Programme of the 21st biennial conference/general meeting on adding value to a reforming economy-Challenge for the quantity surveying profession in Nigeria*: Nigeria Institute of Quantity Surveyors)
- Obiegbu, M. E. (2012). Control of Building Production Stages: Requirements for best practice. In: *Mandatory workshop organised by the Council of Registered Builders of Nigeria* (Confluence Beach Hotel, Lokoja-Kogi State, Nigeria)
- Olatunji, O. A. and Bashorun, N. (2006). A system view of the labour profile structure of the construction industry in the developing countries: Nigeria, a case study. In: *International Conference in the Built Environment in the 21st Century (ICiBE)*, Ed J V Torrance, *et al.* (Kuala Lumpur, Malaysia)
- Recio, A. de Alós-Moner, R. and Olivares, I. (2006). Construction in Spain: towards a new regulation? (Barcelona: Centre d'Estudis Sociològics sobre la Vida Quotidiana i el Treball (QUIT), Universitat Autònoma de Barcelona)
- Rhodes, E. and Carter, R. (2003). Collaborative learning in advanced supply systems: the KCLASS pilot project *The Journal of Workplace Learning* **15** 271-9



- Rushton, L., Bagga, S., Bevan, R., Brown, T. P., Cherrie, J. W., Holmes, P., Hutchings, S. J., Fortunato, L., Slack, R., Van Tongeren, M., Young, C. and Evans, G. (2012). The burden of occupational cancer in Great Britain - Overview report (RR931), In: *RR931*, (UK: Health and Safety Executive)
- Sharp, G. (Ed) (2010). *Construction Statistics Annual, No. 11* (UK: The Office for National Statistics)
- Smallwood, J. J. (1998) Client influence on contractor health and safety in South Africa *Building Research and Information* **26** 181-9
- Smallwood, J. J. and Haupt, T. C. (2006) Impact of the construction regulations: the quantity surveyors' perceptions. In: *Annual Research of the Conference of the Royal Institute of Chartered Surveyors*, Ed E Sivyer (University College London)
- Tummala, V. M. R., Philips, C. L. M. and Johnson, M. (2006). Assessing supply chain management success factors: a case study *Supply Chain Management: An International Journal* **11** 179-92
- Vrijhoef, R. and Ridder, H. A. J. (2005). Supply chain integration for achieving best value for construction clients: client-driven versus supplier-driven integration. (Brisbane, Australia)
- Winch, G. M. (2002) *Managing Construction Projects: An Information Processing Approach*: John Wiley & Sons)