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ABSTRACT

Persistent disputes among contracting parties in the Nigerian construction industry is a cord in the wheel of effective construction projects delivery. The aim of this study is to evaluate the causes of disputes among the contacting parties in the Nigerian construction industry and to proffer solutions or strategies on how to minimize or resolve them. This study mirrors the perception of The Nigerian Quantity Surveyors (NQSs) as to causes of construction disputes. Stratified random sampling technique was adopted with the use of structured questionnaire for data collection. Eighty (80) questionnaires were distributed and Fifty five (55) professionally qualified Quantity Surveyors in consulting, contracting, educational and public service sectors filled the questionnaire. The study shows that client's outright refusal to pay for or late payments of work done by contractor and variations order, sub-standard works on the part of contractors and design inadequacies on the part of the consultants are the dominants causes of construction disputes in the Nigerian construction industry. The study concluded that disputes in the Nigerian construction industry can be minimized or avoided if all the stakeholders are always ready to perform their duties as stipulated in the conditions of contract. The study recommends that clients should be financially buoyant before embarking on any construction project in other to pay contractors' promptly as stipulated in the conditions of contract. Thorough review of the designs will minimize or eliminate variation. To avoid shoddy work, previously completed jobs as claimed by the prospective contractor should be visited to ascertain contractor's technical capability. To ensure accurate design that meets the client's need and devoid of inadequacies, design model and briefing section should be a predominant duty of design team to help clients have a better idea of the end product and iron out grey areas before construction phase.

Key words: Disputes; Nigerian Construction Industry; Perception; Panorama; Quantity Surveyors.

INTRODUCTION

Construction activity forecasts the general direction of an economy and the industry is often described as a leading economic sector (Dantata, 2008). The intrinsic nature of construction contract and human nature result to disputes among the stakeholders. Okuntade (2014) opined that, the nature of dispute in the construction industry is so complex that if not properly managed, can reduce productivity and escalate to prolonged litigation. Kheng (2003) asserted that construction industry is a fertile source of disputes. For decades the construction industry has been mired in adversarial relationships between owners and contractors each party's priorities are unsurprisingly at conflict with the others, establishing a repetitive cycle of hostilities (Richard & Gibson, 2006) and pinpointed that construction disputes can begin at any phase of the project from program, design, procurement, during the project, or project close out and the impacts can often have diverse effects on project financing, budget, schedule, quality, maintenance, safety, and client satisfaction. The study aim at evaluating the causes of disputes among contracting parties in the Nigerian construction industry in attend to proffer strategies of avoiding them. In actualizing the aim of the study, the following objectives were postulated:

To identify and assess disputes causative agents in the Nigerian Construction Industry

- i. To identify and evaluate causes of construction disputes among the contracting parties and
- ii. To recommend strategies for avoiding construction disputes.

OVERVIEW OF NIGERIA CONSTRUCTION INDUSTRY AND DISPUTES

According to Richard and Gibson (2006), the construction industry has become known as one of the most adversarial and problem-prone, with claims and disputes on construction projects frequently the rule rather than the exception. Cost overruns and schedule delays can be the subject of expensive and protracted claims and litigation, and pose serious risks for all parties to a construction project. Edwin and Henry (2005) identified variations; extension of time; payments; quality of works; technical specification; availability of information; administration/management; unrealistic client expectations; risk allocation; project scope definition; poor communication; difference in ways of doing things; lack of team spirit; previous working relationships; adversarial approach in handling disputes; unfamiliar with local conditions; conflict of laws; jurisdictional problems; lack of local legal system; and unclear contractual terms as sources of disputes. Femi (2014) posited that, the rationale behind the efforts to identify the sources of disputes in construction has been the premise that if the origins of the 'illness' can be identified, ways to 'cure' the industry from unnecessary litigation can be developed. According to Jeffery (2002), disputes occur even though the parties involved all are well intended. This often happens because someone "drops the ball" by failing to communicate effectively with another concerning design issues, compensation and payment issues, scope change issues and the like, leading to legal disputes. The impacts of construction disputes can often have diverse effects on project financing, budget, schedule, quality, maintenance, safety, and client satisfaction (Femi, 2014). Femi (2014) further states that the issues of construction disputes and remedies for resolving them, have received attention over some decades with various research in the world, exploring and providing meaningful contribution in these aforementioned areas.

DISPUTES CAUSATIVE AGENTS IN THE NIGERIAN CONSTRUCTION INDUSTRY

It is an established procedure world over that there are mainly two (2) parties to a construction contract arrangement namely the client and the contractor. However, it also an established fact that others who are either working for or with clients and contractors are in most cases disputes causing entities. Ali (2005) opined that disputes often arose between the client and the contractor. Meanwhile, Ashworth (2006) categorized causes of disputes in the construction industry into: client related, consultants and contractor related as outlined in table 1. Figure 1 presents a conceptual framework of construction disputes causative agents which are: client, consultants and the contractor. The arrows indicate bi-literal relationship between the disputes causing agents. Disputes can emanate from any of the parties.



Figure 1: Conceptual framework of Construction Disputes Causative Agents **Source:** *Author's Perception* (2017)

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Causes of Disputes	Source(s)
Clients	
Poor briefing during design stage	Ashworth (2006)
Changes and variation requirements	Ashworth (2006)
Changes to standard conditions of contract	Ashworth (2006)
Interference in the contractual duties of the contract administrator	Ashworth (2006)
Late payment to contractor	Ashworth (2006)
Unrealistic expectations of the parties, particularly employers	
who have insufficient financing to accomplish their objectives	Edwin (2005)
Clients fail to pay variation claim Cheung and Kenneth (2007)	
Failure to respond in timely manner	Ashworth (2006)
Inadequate tracing mechanisms for request of information	Ashworth (2006)
Deficient management, supervision and coordination efforts	
on the part of the project	Ashworth (2006)
Lowest price mentality in engagement of contractors and designers	Ashworth (2006)
The absence of team spirit among the participants	Ashworth (2006)
Reluctant to check for constructability, clarity and completeness	Ashworth (2006)
Failure to appoint a project manager	Ashworth (2006)
Discrepancies / ambiguities in contract documents	Ashworth (2006)
Consultants	
Design inadequacies	Ashworth (2006)
Lack of appropriate competence and experience	Ashworth (2006)
Unclear delegation of responsibilities	Ashworth (2006)
Late issue of design information/drawings	Ashworth (2006)
Errors/substantial changes in bills of quantities	Cheung (2007)
Variations due to design errors	Cheung (2007)
Design and specification oversights, and errors or omissions	
resulting from uncoordinated civil, structural, architectural,	
mechanical and electrical designs	Jeffery (2002)
Failure to understand its responsibilities under the design	
team contract	Ashworth (2006)
Late information delivery and cumbersome approach to	
request for information's	Ashworth (2006)
Incompleteness of drawing and specifications	Ashworth (2006)
Contractors	
Inadequate site management	Ashworth (2006)
Poor planning and programming	Ashworth (2006)
Poor standard of work	Ashworth (2006)

Table 1: Causes of Disputes among Stakeholders in the Construction Industry

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Delayed payment to subcontractors	Ashworth (2006)
Failure to proceed works in a competent manner	Cheung (2007)
Failure to coordinate its subcontractors' work through effective	
and timely exchange of shop drawings	Jeffery (2002)
Lack of understanding and agreement in	
contract procurement	Carmichael (2002)
Delay/ suspension of works	Ashworth (2006)
Failure to plan and execute the changes of works	Ashworth (2006)
Failure to understand and correctly bid or price the works	Ashworth (2006)
Reluctance to seek clarification	Ashworth (2006)
Inadequate CPM scheduling and update requirements	Ashworth (2006)
Source: Ashworth A (2006) Contractual Procedures in the Constru	ction Industry Fifth

Source: Ashworth, A. (2006), *Contractual Procedures in the Construction Industry*, Fifth Edition, Pearson Education Limited, England.

RESEARCH METHOD

Quantity Surveyors are often saddled with the responsibilities of drafting, interpreting clauses in the conditions of contract and are in most cases involved in construction disputes resolution due to their experience in handling technical and financial issues that borders on construction contract. These formed the reasons of selecting Quantity Surveyors as the bases for this work. The research adopted qualitative and quantitative approach. To obtain and present realistic and dependable results, only experienced professionally qualified Quantity Surveyors (QSs) namely members and fellows of The Nigerian Institute of Quantity Surveyors residing in Lagos State were considered as target population. According to NIQS directory of members (2016) out of 3,111 of professional Quantity Surveyors in Nigeria, 957 reside and work in different sectors in Lagos representing 31% of the population. Besides the concentration of professional Quantity Surveyors in Lagos State, the state is known to be leading in terms of complex construction projects execution these form the bases for its selection. Stratified random sampling technique was adopted. In other to obtain a robust and reliable result, professional Quantity Surveyors in Lagos state were grouped into different sectors such as the lecturers in the academic, consulting firms, contracting firms and the ministry in Lagos State. .

Primary data sourced from the sample using questionnaire were collated and presented using tables. Other forms of inferential statistical tools used for data analysis included: Relative importance index, ranking, and frequency and mean with the aid of statistical package for social sciences (SPSS) and Microsoft excel Eighty (80) questionnaires were prepared and distributed but only fifty-five (55) were filled and analyzed. Background information of the respondents was presented using table. In

other to achieve objective number one and two, disputes causative agents were identified through reputable extant literature and evaluated using relative importance index and ranking. Frequencies of respondents were obtained in terms of Likert's scale of (1-5) using: 5- Strongly Agree, 4- Agree, 3-Uncertain 2- Disagree, 1- Strongly Disagree and the result was ranked to ascertain the leading disputes causative agent among the clients and the contractors in the Nigerian Construction Industry. The respondents also indicated the degree of severity of identified disputes and the results were ranked. Objective three was achieved by evaluating identified possible means of curbing construction disputes established through extant literature and respondents' recommendation as sourced from the questionnaire. The Relative Importance Indices were calculated using the mathematical expression below.

Relative Importance Index (RII) = Sum of weights (w1 + w2 + w3 + w4 + w5)(A x N)

Where w is the weighting given to each variable by the respondents, ranging from 1 to 5. A is the highest weight (i.e 5) in the study; and N is the total number of samples

Years of Experience	Frequency
1-5	7
6 – 10	35
11 – 15	6
16 and Above	7
Total	55
Professional Qualification	Frequency
Associate Members	52
Fellows	3
Total	55
Employments' Status	Frequency
Government Parastatal	23
Academics	6
Consultancy	18
Contracting	8
Total	55

DATA PRESENTATION, ANALYSIS AND DISCUSSION Table 2: Demographic Data of Respondents

Table 2 shows the years of experience, professional qualifications and place of engagement of the respondents. 13% of the respondents have between 1-5 years of

working experience in the Nigerian construction industry. 64% have between 6-10 years of experience in the industry. 11% have between 11 - 15 years working experience. 13% have working experience from 16 years and above. From the foregoing information, it shows clearly that most of the respondents have between 6 - 10 years of working experience as professionally qualified Quantity Surveyor which is sufficient to have experience one form of construction disputes or another at different phases of construction process namely, pre-contract stage, post-contract stage and during construction stage.

Client Factors	(RII)	RANK	
Changes and variation requirements	0.862	1 st	
Late payment to contractor	0.862	1 st	
Clients fail to pay variation claims	0.858	3 rd	
Poor briefing during design stage	0.858	3 rd	
Unrealistic expectations of the parties, particularly			
employers who have insufficient financing	0.844	5 th	
Discrepancies / ambiguities in contract documents	0.833	6 th	
Changes to standard conditions of contract	0.771	7 th	
Lowest price mentality in engagement of contractors			
and designers 0.	771	7 th	
Failure to respond in timely manner	0.760	9 th	
Deficient management, supervision and coordination			
efforts on the part of the project	0.756	10 th	
Interference in the contractual duties of the contract			
administrator	0.742	11 th	
The absence of team spirit among the participants	0.735	12 th	
Reluctant to check for constructability, clarity and			
completeness	0.720	13 th	
Inadequate tracing mechanisms for request of			
information	0.662	14 th	
Failure to appoint a project manager	0.662	14 th	
Key: RII = Relative Importance Index.			

Table 3: Causes of Disputes in the Nigerian Construction Industry – Client Related

Table 3 shows the factors responsible for disputes in the Nigerian construction industry caused by the client as one of the major stake holders. The ranking of these factors shows that Late payment to contractor as well as changes and variation requirements which ranked 1st with RII = 0.862 are predominantly leading causes of disputes emanating from the client organization. Clients failure to pay variation claims

and poor briefing during design stage with RII = 0.858 are the next factors that bring about uproar between the contractual parties. Insufficient funding and unrealistic expectations ranked 5th with RII = 0.844 which closely relates to monetary issues. At the bottom of the table is inadequate tracing mechanisms for request of information and failure to appoint a project manager ranked 14th with RII = 0.662.

Consultant Factors	(RII)	RANK
Design inadequacies	0.920	1 st
Variations due to design errors	0.895	2^{nd}
Design and specification oversights, and errors or omissions	0.887	3^{rd}
Incompleteness of drawing and specifications	0.884	4^{th}
Errors/substantial changes in bills of quantities	0.869	5^{th}
Lack of appropriate competence and experience	0.865	6 th
Late issue of design information/drawings	0.815	7^{th}
Late information delivery and cumbersome approach to		
request for information	0.796	8^{th}
Unclear delegation of responsibilities	0.789	9^{th}
Failure to understand its responsibilities under the design		
team contract	0.789	9^{th}

Table 4. Causes of Dis	nutes in the Nigerian	Construction Industr	v - Consultant Related
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Key: RII = Relative Importance Index.

Table 4 discloses that, design inadequacies ranked 1st with RII = 0.920 is the foremost and most frequent of the consultant disputes causative factors. Follow by Variations due to design errors ranked 2nd with RII = 0.895. Since consultants are not parties to a construction contract but are agents of the consultants, their actions and inactions are attributed to the client. Sambasivan and Soon (2007) identified consultant related factors as - delay in approval of variation statements, discrepancies between contract documents, delay preparation and approval of drawings, quality assurance and waiting time for approval of test and inspection. These submissions agree with the position of the respondents. The 3rd and 4th factors in ranking relate to design and specification oversight, errors or omissions from uncoordinated civil, structural, architectural, mechanical and electrical drawings and incompleteness of drawing and specifications.

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Contractor Factors	(RII)	RANK
Poor standard of work	0.898	1^{st}
Poor planning and programming	0.865	2^{nd}
Delayed payment to subcontractors	0.847	$3^{\rm rd}$
Failure to proceed works in a competent manner	0.844	$4^{ m th}$
Lack of understanding and agreement in contract		
procurement	0.840	5 th
Failure to understand and correctly bid or price		
the works	0.840	5 th
Delay/ suspension of works	0.822	7 th
Inadequate site management	0.815	8 th
Failure to plan and execute the changes of works	0.807	9 th
Failure to coordinate its subcontractors' work and ensure	1	
Performance	0.793	10^{th}
Reluctance to seek clarification	0.789	11^{th}
Inadequate CPM scheduling and update requirements	0.742	12 th

Table 5: Causes of Disputes in the Nigerian Construction Industry - Contractor Related

Key: RII = Relative Importance Index.

Analysis of contractors' disputes causative factors using relative important index as indicated in table 5 shows that, poor standard of work ranked 1st with RII = 0.898. This is reflected in many defective buildings after completion. This is manifested in sag roof, deflected columns and beams, plastering surface with fine cracks, shoddy painting works just to mention but a few. This as a result of contractors wanting to cut corners and increases their profitability by all means resulting in sub-standard jobs.

Causative Agents	Mean of RII	RANK
Clients	0.184	1^{st}
Contractors	0.180	2^{rd}

In other to ascertain the leading construction disputes causative agent, the mean of relative importance index of the causes of disputes by clients, consultants and contractors were obtained and presented in table 6. The table only comprises of the clients and contractors mean relative index being the two parties to a construction contract. That of the relative index of the consultants was added to that of the clients since consultants are agents of the clients. The result of the analysis shows that among the two disputes causing agents, clients ranked 1st indicating that they are predominantly responsible for disputes in the Nigerian construction industry.

DISCUSSION OF FINDINGS

The information provided by the respondents indicates that, 95% are members of the Nigerian Institute of Quantity Surveyors and 5% are fellows of the institute. Only 3 out of the 55 respondents had reached the cadre of a fellow. 42% works in the government parastatal (Ministries), 11% have their professional calling in the academic sector, 33% works with consulting firms and 15% works with contracting firms. Most of the respondents work in the government parastatal (ministries). The parity in the number of years of professional experience, professional qualification and place of engagements provide basics for in-depth comparism that can be reliable. The least number of years indicated in table 3 is reasonably sufficient to have encountered Conditions of contract stipulates the time duration for construction disputes. payments of interim certificates which is germane to the delivery of construction project to time, any delay in such payments will affect significantly the flow of works on site and the contractor may not be able to proceeds as expected leading to delays and extension in contract period. Some client may in some cases invoke liquidated and ascertained damages which the contractor may object to resulting in disagreement ultimately leading disputes which in most cases takes a little while to resolve while in some cases construction activities are suspended on site. In the research carried out by Love, Davis, Ellis and Cheung (2008), it was submitted that prominent among the construction disputes causative factors are; scope changes, poor contract documentation and contractual ambiguities (Technical issues).

The findings of this work upheld the position of Ali (2005) which posited that payment has been referred as the lifeblood of the construction industry because construction projects involve large capital and take long time to complete and delay payment is often cause of disputes among client and contractor in the Nigeria construction industry. 3rd to variations and late payments issues, are client outright refusal to pay for claims prepared and due to the contractor and poor briefing during design stage. This is especially peculiar to uninformed and partially informed clients. Dato (2006) affirmed that, one of the greatest problems encountered by the contractors is either receiving late payment, nonpayment or short payment. The operation of the payment system is not always smooth. This has an adverse effect on the efficiency and stability of the whole industry. It was further submitted that a failure in timely payment can result in project delay, reduced profitability and also lead the company to going into liquidation (Ali, 2005). The position of the respondents agreed with that of Sambasivan and Soon (2007) that posited that, Clients are disputes causative agents in the construction industry and identified the following as the misdeed of clients that leads to disputes in most cases: Improper arrangement of funds, late payments, owner interference, slow process of decision making and approval, unrealistic time durations,

frequent design change. Femi (2014) opined that client's late payments to contractors, sub-contractors, suppliers and statutory bodies lead to disputes or conflict. Obviously, contractors in most cases disserts construction site for months due to delay payments from the client. Sometimes, the prices of materials skyrockets and the contractor will put in claims for fluctuation which the client is not ready to honor claiming the contract entered into is a firm price of fixed price contract. In this scenario, construction is abandoned and both parties end up negotiating or go for arbitration depending on what was agreed upon as disputes resolving technique(s) in the form of contract or conditions of contract. This agrees with the submission of Isa and Emuze (2016) which posited that, in Nigeria, the amount that each of the disputing parties loses due to litigation on construction project is not known, yet what is known is that conflict occur on project and sometimes degenerates into lawsuit. Ranked 5th is expectations of the parties, particularly employers who have insufficient financing power. Discrepancies / ambiguities in contract documents ranked 6^{th} with RII = 0.833. The 7^{th} dispute causing factors are lowest price mentality in engaging contractor and designer and changes in standard conditions of contract. According to Cole (2002), the use of disclaimer clauses to shift project risks to other contracting parties is still a general practice in the construction industry. This is peculiar to the client organization who engages the services of consultants to draft the conditions of contract. In most cases, the contractors either do not study the conditions of contract or are in a hurry to enter into a contract.

In most cases, designs from the consultants tend to contradict themselves, outright omissions or inadequacies here and there. When these happen it result to delay and the contractor will have to wait to get these discrepancies resolved leading to standing time on site. In some scenario, the bills of quantities will not reflect exactly what the drawings meant due to faulty drawings and inadequate specifications leading to a serious misunderstanding between the contracting parties. Client's desire is to have value for money through functional and aesthetically attractive buildings that reflects their desire homes and any deflection from these results to disputes. According to Ashworth (2006), poor standard of works by the contractor constitutes the predominant cause of dispute among the client and contractor. The client organization will only be willing to pay for works properly done as recommended by the Quantity Surveyor and certified by the Architect. Problems arise when contractor executed shoddy jobs and expected to be paid. Client and contractor are parties to construction contract. It is worthy of note that the margin of the mean relative importance index between both parties is slim. This indicates that, both the clients and contractors contribute to the disputes in the Nigerian construction industry but the client takes the lead as indicated in the analyzed data. In identifying disputes causative agents, Isa and Emuze (2016) identified clients and the contractor as leading agents of dispute during

construction. It was further submitted that consultants are also contributors to construction disputes though acting on behalf of the client.

CONCLUSION

The study aimed at evaluating the causes of disputes among the contacting parties in the Nigerian construction industry and to proffer solutions or strategies on how to minimize or resolve them. The study shows that from client's side, predominantly among the causes of disputes in the construction industry in Nigeria are: Late payment to contractor as well as changes; variation requirements; client's failure to pay variation claims; poor briefing during design stage; insufficient funding and unrealistic expectations. At the bottom of the table are inadequate tracing mechanisms for request of information and failure to appoint a project manager. From the contractor end, carrying out poor standard of works is the most reoccurring cause of disputes with client. This is reflected in many defective buildings after completion evident in sag roof, deflected columns and beams, plastered surfaces with fine cracks and shoddy painting works. This as a result of contractors wanting to cut corners and increases their profitability by all means resulting in sub-standard jobs. Among the contracting parties, clients are the most gullible in falling short of their required responsibilities as indicated in the conditions of contract.

RECOMMENDATIONS

The study recommends that clients should be financially buoyant before embarking on any construction project in other to pay contractors' promptly as stipulated in the conditions of contract. Thorough review of the designs will minimize or eliminate variation. A briefing session showcasing model deigns of proposed structure will help the client and other consultants to have a robust understating of the entire construction process and quickly identify and iron out areas of discrepancies before the working drawings are produced. To avoid shoddy work, technical capacity of prospective contractors should be thoroughly ascertained during prequalification process by visiting previously completed jobs as claimed by the companies to ensure that they have the desire technical capacity and have the ability to construct to desired quality. To ensure accurate design that meets the client's need and devoid of inadequacies, design model and briefing section should be a predominant duty of design team to help client have a better idea of the end product and iron out grey areas before construction phase.

REFERENCES

Ali, A. (2005). "Construction Industry Payment and Adjudication Act" – Reducing Payment -Default and Increasing Dispute Resolution Efficiency.

- Ashworth, A. (2006). *Contractual Procedures in the Construction Industry*, Fifth Edition, Pearson Education Limited, England.
- Cheung, S.O., and Kenneth, T.W. (2007). A study of construction mediator tactics—Part I: Taxonomies of dispute sources, mediator tactics and mediation outcomes, Building and Environment 42, 752–761
- Cole, T.R. (2002). Royal Commission into the Building and Construction Industry. http://www.royalcombci.gov.au/hearings/reports.asp (Accessed 15th December, 2016).
- Dantata, S. A. (2008). *General overview of the Nigerian construction industry*. Massachusetts Institute of Technology. Dept. of Civil and Environmental Engineering.
- Dato, Y.B., and Samy, .S.S., (2006). Speech By YB Dato' Seri S Samy Vellu, Minister of Works, Malaysia at The Offical Launch Of The PAM Contract 2006, Minister Of Works, Malaysia, Grand Ballroom, Hotel Maya, Kuala Lumpur, page 3 Kamaruddin, Master Builders Association Malaysia (MBAM)
- Edwin, H. W. and Henry C. H., (2005). Disputes and Dispute Resolution Systems in Sino-Foreign Joint Venture Construction Projects in China, *Journal of Professional Issues in Engineering Education and Practice @ ASCE*
- Femi, O.T., (2014). Causes and Effects of Conflict in the Nigerian Construction Industry, International *Journal of Technology Enhancements and Emerging Engineering Research*, Vol. 2, Issue 6.
- Isa, R., and Emuze, F., (2016). A Paper on Stakeholders' Perceptions of Construction Dispute Resolution Mechanism in Nigerian Construction, Department of Built Environment, Central University of Technology, Free State, 20 President Brand Street, Bloemfontein, South Africa.
- Jeffery, M. H., (2002). *Ineffective Communication: Common Cause of Construction Disputes*, ABA Lehal Notes Vol.13, No.2

- Kheng, O. C. (2003). Overview Resolution of Construction Industry Disputes. *A paper based on a lecture delivered to The Institution of Engineers, Malaysia (Negri-Sembilan Branch), in Seremban on 24 May 2003.*
- Love, P.E.D., Davis, P.R, llis, J. M., and Cheung. S.O. (2008). A Systemic View of Dispute Causation; *Journal of Building Research and Information*.
- Okuntade, T.F. (2014). Causes and effects of conflicts in Nigerian construction industry. *International Journal of Technology Enhancements and Emerging Engineering Research*, 2(6), pp. 10-16.
- Richard, J.G and Gibson, G.E, (2006). Quantification of Costs for Disputes Resolution Procedures in the Construction Industry, *Journal of Professional issues in Engineering Education and Practice.*
- Sambasivan, M., and Soon, Y.W. (2007). Causes and effects of delays in Malaysian construction industry. *International Journal of Project management*. 25(5), 517-526