

Nature and Influence of Contractual Claims on the Performance of Construction Projects: Evaluation for Sustainable Property Development in Nigeria

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ABSTRACT

This study evaluates the nature and influence of contractual claims on the performance of traditional construction projects in Nigeria. The objectives are to evaluate frequency of occurrence, magnitude, as well as influence of factors on claims, influence of claims on cost, time and quality and importance of claims' mitigation strategies. The study purposively sampled 72 contractors, 66 professionals and 45 clients using a questionnaire. Data was analyzed by using Likert scale, severity index, Mann-Whitney U and Kruskal-Wallis tests. The results show that extra-work, change orders and delay/extension claims are most frequent. Average estimated claim values vary between 6.9% and 30.7% of bid price. Stakeholders have similar view of frequency of occurrence and magnitude of claims (p -values = 0.826 and 0.972 > 0.05). There is a difference in the effect of factors between owners' and contractors' claims (p -value=0.001<0.05), while the influence of contractual claims does not vary among cost, time and quality (p -value=0.691>0.05). The study recommends that stakeholders should avoid claims, by placing priority on the factors with high significance. Stakeholders should adopt the identified mitigation strategies, with emphasis on holding periodic progress reviews and inspections, as well as reading and understanding the contract documents.

KEYWORDS: Contractual claims, Construction projects, Nigeria, Project performance, Stakeholder, Traditional projects.

INTRODUCTION

The physical construction of the built environment (infrastructures and buildings) that supports human life is sole responsibility of the construction sector (Wallbauma et al., 2010). Ojo (2014) noted that construction projects are dynamic and unique, because they are conditionally contractual, complex and lengthy making them vulnerable to risk variables and disputes that are inimical to the project objectives. Similarly, Adindu and Oyoh (2011) noted that construction contracts are often executed under a variety of

conditions involving many unknowns, unexpected, frequently undesirable and often unpredictable factors which manifest in numerous ways, leading to losses and expenses. To recover some of the losses and expenses, claimants usually make legal demand or assertion for compensation, payment or reimbursement under a contract. According to El-Adaway (2008), claims are unavoidable in today's construction industry, because they represent the administrative process required to handle the results and implications of design changes, defective specifications, quantity variations, delays, disruptions and accelerations. Braimah (2008) observed that the majority of claims are contractual in nature and are often caused by

matters that are the employer's responsibility, the contractor's responsibility or that of neither party (for instance, an act of God). A survey conducted in Western Canada found that the majority of claims in construction projects involved some delays, which in many cases go beyond the original contract duration by over 100%, while more than half of the claims were an additional cost of at least 30% of the original contract value. Other research works conducted in the United States and in Thailand observed also that the average cost growth caused by claims was about 7% of the original contract value (Bakhary et al., 2013). According to Zaneldin (2006), construction claims are considered by many project participants to be one of the most disruptive and unpleasant events of a project. Parikh and Joshi (2013) also observed that the majority of construction contracts run into problems, giving rise to claims and disputes among stakeholders due to a variety of unanticipated and indefinite parameters. Delays and disruption claims are amongst the major sources of conflict and contract disputes in construction projects (Aibinu, 2009; Shrestha et al., 2014). Ojo (2014) also noted that many projects have failed due to such factors as claims and unresolved disputes between contracting parties or due to actions of the parties or breach of any salient condition of the contract. There is an indication that the procurement and contract system may have some effect on claims and construction disputes. Some studies, such as Libor (2001), Harmon (2003), Hassanein and El-Nemr (2008), Braimah (2008), Ilgar, (2005), Zaneldin (2006), Adindu and Ibronke (2012) and Bakhary et al. (2013), have carried out investigations on claims, but have neither looked at them from a delivery method view nor at their influences on project performance. Hence, this study concentrates on projects procured by traditional method. The traditional approach which, according to Babatunde, Opawole and Ujaddughe (2010), separates the design, tendering process and construction tasks, has been historically the most popular method in the procurement of both public and private infrastructure projects in Nigeria (Idoro et al., 2007). This study,

therefore, aims at evaluating the internal stakeholders' perception of the nature and influence of contractual claims on the performance of traditional construction projects in Nigeria, with a view to advancing the knowledge of nature, costs and risk factors influencing contractual claims for the enhancement of sustainable property development in Nigeria. Since Adindu and Ibronke (2012) observed that project performance is often measured by the extent to which predetermined parameters of time, cost and quality criteria are met, this study uses these criteria in its evaluation. Farooqui and Azhar (2014) also observed that an inherent feature of the construction industry is disputes arising out of several types of claims which tend to destroy relationships and increase time and cost of construction projects.

OBJECTIVES

The objectives of the study are to: (1) evaluate frequency of occurrence of identified contractual claims in traditional projects, (2) estimate the magnitude of the categories of contractual claims, (3) evaluate the influence of factors on the amount of contractual claims, (4) assess the influence of contractual claims on cost, time and quality performance and (5) assess level of importance of claims' mitigation strategies in traditional projects.

Meaning and Types of Claims

Claim is defined as "a request, demand, application for payment or notification of presumed entitlement to which the contractor, rightly or wrongly at this stage, considers himself entitled and in respect of which an agreement has not yet been reached (Hassanein and El-Nemr, 2008). Braimah (2008) referred to claims in construction projects as any application by the contractor whether for an extension of time, payment or otherwise, which arises other than under the ordinary contract provisions for payment of a certain value of work. Claims can be owners' contract claims or contractors' contract-based claims (Libor, 2001;

Bakhary et al., 2013). Libor (2001) categorized claims by the contractor or owner as: formal and constructive change order claims, disruption claims, acceleration claims, delay and extension claims, termination claims, quantum merit, lien claims, third party claims, bond claims, tort actions and statutory claims. Claims are also classified into loss of productivity claims, cardinal changes' claims, project float claims and acceleration claims (Ilgar, 2005). Zaneldin (2006) classified claims into: contract ambiguity claims, delay claims, acceleration claims, changes' claims, extra-work claims and different site condition claims. These classifications served as a basis for some variables of this study.

Causes of Claims in Construction Projects

Studies on claims in construction projects have identified some of their causes, such as: size and duration of the project, complexity of contract documents, poor communication, limited resources, financial issues, inadequate design, labor issues and force majeure events (Harmon, 2003). Zaneldin (2006) also identified 26 causes of claims. Some of the most frequent ones are as follows: change or variation orders, delay caused by owner, oral change orders by owner, delay in payments by owner, low price of contract due to high competition, changes in material and labor costs, owner personality, variations in quantities, subcontracting problems, delay caused by contractor, contractor's poor organization, contractor financial problems, bad quality of contractor's work, among others. Other causes are: complexity of the project being undertaken, an inflexible price structure and the contractual approach taken by most owners (El-Adaway, 2008). Adindu and Oyoh (2011) identified 14 claim factors selected from the standard conditions of building contracts in use in Nigeria. Some of these factors are: discrepancies and divergence between contract documents, inaccurate setting-out, testing of materials used, payment of royalties, variations arising from architects' instructions, proven extra cost which cannot be fully

accommodated in variation valuation, errors or omissions in the description or quantities in the BOQ, extension of time and direct loss and/or expense due to disturbance of work progress, among others. These factors identified from literature served as the basis for the factors used in this study.

Strategies for Claims' Mitigation during Construction

According to Hassanein and El-Nemr (2008), solutions to claims were always better sought through minimization of claims to the extent possible through proper contract management, adequate planning and scheduling and appropriate documentation and record keeping. Similarly, Richard-J.-Long (2013) identified some mitigation activities, like reading and understanding the contract documents, implementing a document control system to capture, code and file documents, holding pre-construction meetings and reaching agreements on key project objectives, among others. Yusuwan and Adnan (2013) also identified good record keeping, adequate knowledge of contract, preservation of rights, qualifying change orders, planning and scheduling and taking proactive actions. These mitigation strategies were adapted for evaluation in this study.

Hypotheses of the Study

Four hypotheses were postulated for this study. The first one states that there is no significant variation in the perception of the frequency of occurrence of identified categories of contractual claims among the stakeholders. The second one states that there is no significant variation in the perceived magnitude of contractual claims among the categories of respondents. The third hypothesis states that the perceptions of the influence of identified factors on contractor-related claims and client-related claims do not significantly differ. The fourth hypothesis states that the perceptions of the influence of contractual claims on cost, time and quality performance do not significantly vary in the construction industry. The

results of these hypotheses will assist property developers in establishing the yardstick for harmonizing priority placement on factors influencing contractual claims as well as mitigation techniques for sustainable property development in Nigeria.

RESEARCH METHODS

This study is an exploratory study using structured questionnaires. The study population consists of architects, engineers, builders, quantity surveyors and estate surveyors, clients and contractors involved in the development of construction projects in Nigeria, with emphasis on traditional procurement method. The study adopted purposive and snowballing sampling techniques to obtain 210 stakeholders, resulting in 183 valid questionnaires comprising 72 contractors, 66 professionals and 45 clients. 13 types of contractual claims, 31 factors affecting the types of claims and 13 claim mitigation strategies were identified from literature, while cost, time and quality were the performance criteria. The measurements were on a five point Likert-scale; namely: nil=1, low=2, moderate=3, high=4 and very high=5, to assess magnitude and frequency of claim occurrence, influence of factors on performance. The severity index (SI) and influence of claim on project calculated were then differently

classified as: No Significance (NS): 0-0.359, Low Significance (LS): 0.36-0.529, Moderate Significance (MS): 0.53-0.679, High Significance (HS): 0.68-0.839, Very High Significance (VHS): 0.84-1.0, as adapted from Ujene et al. (2011). The scale for the evaluation of financial loss was 1-10 % (1), 11-20% (2), 21-30% (3), 31-40% (4) and 41-50% (5) from which the average percentage of value of claim was computed using the formula in equation (1) as adapted from Ujene and Umoh (2013).

$$X_p = L_b + 10 (P) \dots\dots\dots (1)$$

where, X_p is the average percentage value of the claim, L_b is the lower boundary of percentage range corresponding to the integer of Mean Score, P is the decimal value of mean score. The perceptions among the categories of respondents were compared using Kruskal Wallis test, while the perceptions on contractor-related claims and client-related claim were compared using Mann-Whitney U- test, since the data was obtained on ordinal scale through subjective/perceptive evaluation.

PRESENTATION OF RESULTS

Characteristics of Respondents

Some characteristics of the respondents were examined and the results presented in Table 1.

Table 1. Descriptive results of respondents' characteristics

Characteristics of respondents	Sub-characteristics	No.	%	Characteristics of respondents	Sub-characteristics	No.	%	
All respondents	Professionals	66	36.1	Contractors	Indigenous	64	88.8	
	Clients	45	24.6		Expatriate	8	11.2	
	Contractors	72	39.3					
	Total	183	100		Total	72	100	
Professionals' affiliation	Architects	21	31.8	Managerial capability of contractor	Inadequate	0	0	
	Builders	9	13.6		Fairly adequate	05	6.9	
	Engineers	24	36.4		Adequate	50	69.4	
	Surveyors	12	18.2		Highly adequate	11	15.3	
	Total	66	100		V.H.adequate	06	8.4	
				Total	72	100		

Age of professionals	1-17yrs.	0	0	Small size	1-49 employees	45	62.5
	18-60yrs.	53	80.3	Medium size	50-249 employees	21	29.2
	>60yrs.	13	19.7	Large size	>500 employees	06	08.3
	Total	66	100		Total	72	100
Qualification of professionals	OND/HND	12	18.2	Category of contractor's registration	≤ ₦ 5 million	29	40.3
	B.Sc.	21	31.8		≤ ₦ 50 million	21	29.2
	M.Sc.	29	43.9		≤ ₦ 250 million	17	23.6
	Ph.D.	4	6.1		> ₦ 250 million	5	6.9
	Total	66	100		Total	72	100
Experience of professionals	1-5yrs.	14	21.2	Experience of contractor	1-5yrs.	15	20.8
	6-10yrs.	20	30.3		6-10yrs.	23	31.9
	11-15yrs.	11	16.7		11-15yrs.	17	23.6
	16-20yrs.	14	21.2		16-20yrs.	11	15.3
	>20yrs	7	10.6		>20yrs.	6	8.4
	Total	66	100		Total	72	100
Sex of professionals	Male	52	78.8	Clients	Public	10	22.2
	Female	14	21.2		Private	35	77.8
	Total	66	100		Total	45	100

Table 1 shows that the majority of the professionals were engineers and architects, mostly males who have the basic qualification and experience to give reliable information on the subject matter. The results also show that the sampled contractors were mostly indigenous, of mainly small and medium categories, having an experience range up to twenty years, with adequate managerial capability; hence the contractors could also be relied on for the information based on their wealth of experience in the industry. The results also show that the majority of the clients sampled were private; this is because of the difficulty of representatives of government (public client) releasing information for security reasons.

Frequency of Occurrence of Different Contractual Claims

For the purpose of evaluating the frequency of occurrence of contractual claims in traditional projects, 13 categories of contractual claims were identified from literature. Respondents were then requested to

rate the frequency of occurrence using the scale described in the methodology. The results are presented in Table 2.

The results in Table 2 show that clients perceive that delay and extension claims are most frequent, followed by termination claims, while change order claims were ranked third. The professionals in their view perceive that extra-work claims are most frequent, while change order claims and disruption claims rank second and third, respectively. In view of the likelihood of non-significance in perception, the entire respondents view were combined. This shows that in terms of frequency of occurrence of claims in the construction industry, extra-work claims, change order claims and delay/extension claims rank first, second and third respectively, while quantum merit claims are least frequent in Nigerian construction industry. Two claims were very highly significant, six highly significant, four moderately significant and one lowly significant.

Table 2. Results of evaluation of the frequency of occurrence of contractual claims

Categories of contractual claims	Clients' Perception N=45		Professionals' Perception N=66		Contractors' Perception N=72		Mean Perception N=183		Remarks
	SI	Rank	SI	Rank	SI	Rank	SI	Rank	
Extra-work claims	0.85	4	0.86	1	0.86	2	0.86	1	VHS
Formal and constructive change order claims	0.88	3	0.85	2	0.92	1	0.85	2	VHS
Delay and extension claims	0.96	1	0.83	4	0.76	3	0.81	3	HS
Termination claims	0.91	2	0.75	6	0.70	6	0.77	4	HS
Different site condition claims	0.73	7	0.65	9	0.73	5	0.76	5	HS
Disruption claims	0.57	11	0.84	3	0.75	4	0.74	6	HS
Contract ambiguity claims	0.83	5	0.82	5	0.58	11	0.73	7	HS
Acceleration claims	0.75	6	0.66	8	0.68	7	0.69	8	HS
Non-performance/Loss of productivity claims	0.57	11	0.67	7	0.66	9	0.64	9	MS
Bond claims	0.65	9	0.47	12	0.68	7	0.60	10	MS
Tort actions and statutory claims	0.60	10	0.48	11	0.66	9	0.58	11	MS
Third party claims	0.72	8	0.59	10	0.36	13	0.53	12	MS
Quantum merit claims	0.36	13	0.45	13	0.58	11	0.48	13	LS

Estimation of Values of Contractual Claims

In order to estimate the magnitude of the categories of contractual claims, respondents were requested to indicate their estimation of the values of the different claims as percentages of the original contract sum in traditional projects they have been involved in. The method of evaluation is as described in the methodology. The results are presented in Table 3.

The results in Table 3 show that the three categories of stakeholders perceive that extra work claims usually have the highest amount of contractual claims varying up to 4.5% higher than the mean estimated value of 30.7% of bid price. Delay and extension claims ranked next with the professionals perceiving that the value can vary up to 18.4% above the estimated mean value of 23.9% of bid price. The results also show that different site condition claims and change order claims ranked third and fourth, respectively. The professionals perceive that different site condition claims can vary up to 8.8% above the mean value of 22.5%, while the

clients perceive that change order claims can vary up to 4.5% above the mean value of 22.4%. The results also show that tort actions and statutory claims and quantum merit claims have the least mean values of 11.3% and 6.9%, respectively.

Influence of Factors on Contractual Claims

The influence of 31 identified factors from literature on the amount of contractual claims was evaluated by requesting the respondents to assess the influence of the factors on the amount of client contract claims and contractor contract-based claims, using the method earlier described. The results are presented in Table 4. Table 4 shows that the respondents perceive that three factors have high influence on client-based claims; namely, defective or incomplete work/execution errors, inexperience of contractor and termination of work. It is also perceived that 21 factors have moderate influence on clients' claims, while two factors are considered to have no influence on clients'

claims. Conversely, the respondents perceive that five factors have very high influence on contractor-based claims, the most significant among which are: change or variation orders, delay in payments by owner and setback caused by client. Respondents also perceive

that 13 factors have high influence on contractors' claims, while four factors have low influence on contractors' claims. None of the identified factors was perceived to have no influence on contractor-based claims.

Table 3. Results of estimation of the amount of contractual claims

Categories of contractual claims	Clients' Perception N=45			Professionals' Perception N=66			Contractors' Perception N=72			Mean Perception N=183		
	MS	%cost	Rank	MS	%cost	Rank	MS	%cost	Ran	MS	%cost	Rank
Extra-work claims	4.11	32.1	1	3.95	30.5	1	3.89	29.9	1	3.97	30.7	1
Delay and extension claims	3.04	21.4	5	3.73	28.3	2	3.04	21.4	5	3.29	23.9	2
Different site condition claims	3.27	23.7	2	3.35	24.5	3	2.89	19.9	8	3.15	22.5	3
change order claims	3.24	23.4	3	3.12	22.2	5	3.10	22.0	3	3.14	22.4	4
Termination claims	3.09	21.9	4	2.91	20.1	8	3.25	23.5	2	3.09	21.9	5
Acceleration claims	2.87	19.7	7	3.00	21.0	7	3.01	21.1	6	2.97	20.7	6
Contract ambiguity claims	2.87	19.7	7	3.20	23.0	4	2.60	17.0	11	2.88	19.8	7
Disruption claims	2.73	18.3	10	3.06	21.6	6	2.65	17.5	10	2.82	19.2	8
Non-performance/No productivity claims	2.84	19.4	9	2.33	14.3	10	3.07	21.7	4	2.75	18.5	9
Bond claims	2.31	14.1	11	2.64	17.4	9	3.00	21.0	7	2.70	18.0	10
Third party claims	3.00	21.0	6	2.33	14.3	10	2.75	18.5	9	2.66	17.6	11
Tort actions and statutory claims	1.82	9.2	12	1.77	8.7	12	2.39	14.9	12	2.03	11.3	12
Quantum merit claims	1.49	5.9	13	1.45	5.5	13	1.78	8.8	13	1.59	6.9	13

Table 4. Results of influence of identified factors on the amount of contractual claims

Factors influencing the amount of contractual claims	Owners' contract claims N=183				Contractors' contract-based claims N= 183			
	Sum	SI	Rank	Rmk.	Sum	SI	Rank	Rmk.
Change or variation orders	291	0.32	31	NS	839	0.92	1	VHS
Delay in payments by owner	294	0.33	30	NS	788	0.86	2	VHS
Setback caused by client	389	0.43	28	LS	778	0.85	3	VHS
Poor contract documentation	469	0.51	27	LS	780	0.85	3	VHS
Changes in material and labor costs	507	0.55	21	MS	767	0.84	5	VHS

Default and /or delays of nominated subcontractors	471	0.51	26	LS	755	0.83	6	HS
Complexity of the projects being undertaken	509	0.56	20	MS	761	0.83	6	HS
Low price of contract due to high competition	510	0.56	19	MS	762	0.83	6	HS
Variations in quantities	518	0.57	18	MS	744	0.81	9	HS
Subsurface problems	486	0.53	25	MS	715	0.78	10	HS
Termination of work	622	0.68	3	HS	695	0.76	11	HS
Specifications' and drawings' inconsistencies	495	0.54	23	MS	692	0.76	11	HS
Loss and/or expense of due payment of royalties	494	0.54	24	MS	674	0.74	13	HS
Estimating errors	521	0.57	17	MS	663	0.72	14	HS
Design errors or omissions	500	0.55	22	MS	662	0.72	14	HS
Default and /or delays of nominated supplier	381	0.42	29	LS	650	0.71	16	HS
Direct loss and /or expense due to disturbance of work progress	539	0.59	14	MS	631	0.69	17	HS
Force majeure events	533	0.58	15	MS	624	0.68	18	HS
Suspension of work	544	0.59	12	MS	609	0.67	19	MS
Accidents	541	0.59	13	MS	607	0.66	20	MS
Poor communication between parties	562	0.61	11	MS	600	0.66	20	MS
Government regulations	568	0.62	9	MS	606	0.66	20	MS
Contractor financial problems	577	0.63	5	MS	593	0.65	23	MS
Planning errors	576	0.63	5	MS	562	0.61	24	MS
Contractor's poor organization	524	0.57	16	MS	553	0.60	25	MS
Protective work ordered on the breakout of hostilities	565	0.62	10	MS	534	0.58	26	MS
Scheduling errors	578	0.63	4	MS	535	0.58	26	MS
Loss and/ or expense in dealing with antiquities	571	0.62	8	MS	468	0.51	28	LS
Extension of time	575	0.63	7	MS	451	0.49	29	LS
Inexperience of contractor	658	0.72	2	HS	417	0.46	30	LS
Defective or incomplete work /execution errors	706	0.77	1	HS	397	0.43	31	LS

Rmk. = Remarks.

Assessment of the Influence of Contractual Claims on Cost, Time and Quality

The influence of 13 identified contractual claims on cost, time and quality was assessed by requesting the

respondents to indicate their evaluation of the influence on the performance criteria using the scale described in the methodology. The results are presented in Table 5.

Table 5. Results of influence of contractual claims on cost, time and quality

Categories of contractual claims	Influence on quality N=183			Influence on time N=183			Influence on cost N=183		
	Sum	SI	Rank	Sum	SI	Rank	Sum	SI	Rank
Extra-work claims	778	0.85	2	737	0.81	3	770	0.84	1
Contract ambiguity claims	686	0.75	5	706	0.77	4	769	0.84	2
Termination claims	805	0.88	1	781	0.85	1	737	0.81	3
Delay and extension claims	735	0.80	3	763	0.83	2	706	0.77	4
Acceleration claims	709	0.77	4	694	0.76	5	691	0.76	5
Different site condition claims	589	0.64	9	618	0.68	7	659	0.72	6
Formal and constructive change order claims	598	0.65	7	597	0.65	10	622	0.68	7
Disruption claims	654	0.71	6	652	0.71	6	615	0.67	8
Bond claims	586	0.64	9	605	0.66	8	609	0.67	9
Loss of productivity claims	594	0.65	7	604	0.66	9	609	0.67	9
Tort actions and statutory claims	578	0.63	11	530	0.58	13	595	0.65	11
Third party claims	569	0.62	13	573	0.63	12	595	0.65	11
Quantum meruit claims	581	0.63	11	575	0.63	11	578	0.63	13

Table 5 shows that extra-work claims, contract ambiguity claims and termination claims are the three most significant claims influencing the cost performance of construction projects, ranking first, second and third, respectively. It is also perceived that time performance of the project is mostly influenced by termination claims, delay and extension claims and extra-work claims, ranking first, second and third, respectively. Table 5 also shows that termination claims, extra-work claims and delay and extension claims, ranking first, second and third, respectively, are the most significant claims influencing the quality performance of construction projects. On the other hand, the respondents perceive that quantum merit claims, third party claims and tort actions and statutory claims have the least influence on cost, time and quality performance of construction projects.

Assessment of the Importance of Claim Mitigation Strategies

In order to assess the level of importance of claim mitigation strategies, 13 strategies were identified from literature and presented to the respondents. They were asked to indicate their perception of the importance of the strategies using the scale earlier described. The results are presented in Table 6.

Table 6 shows that the professionals and the contractors perceive that holding periodic progress reviews and inspections ranked as the most important mitigation strategy, followed by reading and understanding the contract documents. The clients, however, perceive that holding pre-construction meetings and reaching agreements on key project objectives is the most important mitigation strategy, followed by holding periodic progress reviews and inspections. Table 6 also shows that professionals and contractors perceive that implementing a document control system to capture, code and file documents

followed by prioritizing the relative importance of each objective are the least important mitigation strategies.

Table 6. Results of level of importance of claim mitigation strategies

Claim mitigation strategies	Clients' Perception		Professionals' Perception		Contractors' Perception		Mean Perception		Remarks
	SI	Rank	SI	Rank	SI	Rank	SI	Rank	
Holding periodic progress reviews and inspections	0.82	2	0.85	1	0.87	1	0.84	1	VHS
Reading and understanding the contract documents	0.79	3	0.85	1	0.86	2	0.83	2	HS
Holding pre-construction meetings and reaching agreements on key project objectives	0.85	1	0.79	3	0.77	4	0.81	3	HS
Allocating risks to the party best able to control those risks and provide equitable rewards for assuming risks	0.77	4	0.77	4	0.78	3	0.77	4	HS
Implementing cost, schedule and quality control procedures	0.74	6	0.75	5	0.67	7	0.72	5	HS
Defining clearly the roles and responsibilities of each party	0.68	8	0.72	6	0.71	6	0.70	6	HS
Proactive actions/ quick responses to complaints	0.62	13	0.69	7	0.73	5	0.68	7	HS
Qualifying change orders	0.75	5	0.63	10	0.65	9	0.68	7	HS
Coordinating activities involving several parties	0.69	7	0.67	8	0.67	7	0.67	9	MS
Maintaining open communications throughout the project	0.64	11	0.65	9	0.62	11	0.64	10	MS
Developing performance criteria to communicate expectations and to measure each party's achievements	0.67	9	0.59	13	0.65	9	0.64	10	MS
Prioritizing the relative importance of each objective	0.65	10	0.62	12	0.62	11	0.63	12	MS
Implementing a document control system to capture, code and file documents	0.64	11	0.63	10	0.61	13	0.63	12	MS

Comparison of Perception of Stakeholders on Contractual Claims

To ascertain whether significant variation exists in the perceptions of the stakeholders, the four research hypotheses postulated were tested using Kruskal Wallis

and Mann-Whitney U- tests at $p \leq 0.05$. The decision rule is that if $p\text{-value} > 0.05$, the test accepts the hypothesis, but if $p\text{-value} \leq 0.05$, the test rejects the hypothesis. The results are presented in Table 7.

Table 7. Results of Kruskal-Wallis and Mann-Whitney U- tests for comparing perceptions of stakeholders

Kruskal-Wallis Test								
Items compared among stakeholders	N	Contractors' Mean Rank	Professionals' Mean Rank	Clients' Mean Rank	Chi-Square	p-value	Sig. level	Decision
Frequency of occurrence of contractual claims	13	19.42	19.00	21.58	0.383	0.826	0.05	Accept
Magnitude of contractual claims	13	20.12	20.46	19.42	0.056	0.972	0.05	Accept
Mann-Whitney U- Test								
Items compared among stakeholders	N	Contractor related claims Mean Rank	Client related claims Mean Rank	Z-value	U-value	p-value	sig. level	Decision
Effect of factors on contractor- and client-related claims	31	41.02	21.98	-4.156	185.5	0.001	0.05	Reject
Kruskal-Wallis Test								
Items compared	N	Quality	Time	Cost	Chi-Square	p-value	sig. level	Decision
Influence of contractual claims on cost, time and quality	13	18.23	19.73	22.04	0.740	0.691	0.05	Accept

Table 7 shows that the p-values for the Kruskal-Wallis test to compare the frequency of occurrence as well as magnitude of contractual claims are 0.826 and 0.972, respectively. Since these values are greater than 0.05, this implies accepting the first and second hypotheses stating that significant variation does not exist among the perceptions of the stakeholders on frequency of occurrence and magnitude of claims. Table 7 also shows that a p-value of 0.001 (less than 0.05) implies rejecting the third hypothesis stating that

there is no significant difference in the effect of factors between owners' contract claims and contractors' contract-based claims. This implies that the difference is significant from the results of Mann-Whitney test. Furthermore, a p-value of 0.691 (greater than 0.05) implies accepting the hypothesis stating that the perceptions of the influence of contractual claims on cost, time and quality performance do not significantly vary.

DISCUSSION OF RESULTS

The results of the evaluation of the frequency of occurrence of contractual claims in traditional projects show that extra-work claims, change order claims and delay/extension claims rank first, second and third, respectively. This is similar to the finding of Zaneldin (2006) which ranked these claims second, first and third, respectively. The results also show that two claims were very highly significant, six highly significant, four moderately significant and one lowly significant. This is an indication that eight claims have high level of occurrence and must be taken into account. The results of the estimation of the amount of contractual claims show that average estimated claim values vary between 30.7% and 6.9% of bid price with extra-work claims having the highest amount of contractual claims varying up to 4.5% higher than the mean estimated value of 30.7% of bid price. Delay and extension claims ranked next with the professionals perceiving that the value can vary up to 18.4% above the estimated mean value of 23.9% of bid price. This result is an indication that claims can substantially eat up the contractor's profit. As such, if not properly mitigated, they will have adverse effect on sustainable property development. The results of the evaluation of the influence of the identified factors on the amount of client contract claims and contractor contract-based claims show that three factors have high influence on client-based claims; namely, defective or incomplete work/ execution errors, inexperience of contractor and termination of work. 21 factors have moderate influence on clients' claims, while two factors are considered to have no influence on client claims. Five factors have very high influence on contractor-based claims, most significant among which are: change or variation orders, delay in payments by owner and setback caused by client. 13 factors have high influence on contractors' claims, while four factors have low influence on contractors' claims. The significant factors are similar to those observed by Zaneldin (2006) in the United Arab Emirates. The result is an

indication that the contractor-based claims are most prevalent, hence the contractors may be worst affected. Therefore, for the contractors and their allies to ensure sustainable property development, all claim control measures should be explored. The results of assessment of the influence of contractual claims on cost, time and quality show that extra-work claims, contract ambiguity claims and termination claims are the three most significant claims influencing cost performance, while time performance is mostly influenced by termination claims, delay and extension claims and extra-work claims ranking first, second and third, respectively. The results also show that termination claims, extra-work claims and delay and extension claims are the three most significant claims influencing the quality performance of construction projects. The results show that the significance indices vary between 0.58 and 0.85, implying above moderate influence on the project performance. This is an indication that claims, if not honored as property development progresses, may lead to substandard work to recover extra cost incurred. However, this sometimes results in disputes which could lead to prolonged duration or even abandonment. The results of evaluation of level of importance of claim mitigation strategies show that the stakeholders perceive that holding periodic progress reviews and inspections ranked as the most important mitigation strategy, followed by reading and understanding the contract documents. The significance of reading and understanding the contract documents may be due to the observation by Paulson (1995) that the availability of clear, well supported factual records can help resolve differences before they evolve into disputes and claims. The results also show that the significance indices of the mitigation strategies vary between 0.63 and 0.81, indicating that the identified strategies are at least moderately significant. The results imply that all the identified mitigation strategies could be very useful to stakeholders if sustainable development of properties is to be achieved. The results of the comparison of stakeholders' perceptions on contractual claims show

that significant variation does not exist among the perceptions of the stakeholders on frequency of occurrence and magnitude of claims. This implies that the stakeholders have a common view about the frequency of occurrence and magnitude of claims. It therefore supports the estimation of average claim values which vary between 30.7% and 6.9% of bid price. The results also show that there is significant difference in the effect of factors between owners' contract claims and contractors' contract-based claims. This result is an indication that the factors influencing client claims are conspicuously different from those influencing contractors' claims. Therefore, stakeholders in managing claims should be mindful of the difference for effective management. The results of the comparison of perception further show that the influence of contractual claims on cost, time and quality performance does not significantly vary. This is an indication that stakeholders consider that contractual claims have almost equal influence on the three selected performance criteria. This may be due to the observation by Ujene et al. (2013) that there is a direct relationship between cost of operational efficiency, project duration and quality. This suggests that client needs in terms of time, cost and quality are usually interwoven; hence their consideration is usually essential to successful property development.

CONCLUSIONS

The study endeavored to evaluate frequency of occurrence of identified categories of contractual claims, estimate the magnitude of the categories of contractual claims, evaluate the influence of some identified factors on the amount of contractual claims, assess the influence of contractual claims on cost, time and quality performance and assess level of importance of identified claims' mitigation strategies in traditional projects in Nigeria. Following conclusions can be drawn:

- Two claims were very highly significant, six highly significant, four moderately significant and one

lowly significant.

- Extra-work claims, change order claims and delay/extension claims are the most frequent claims.
- The average estimated claim values vary between 30.7% and 6.9% of bid price with extra-work claims having the highest amount, followed by delay and extension claims.
- The factors which significantly affect clients' claims were different from those which significantly affect contractors' claims.
- Three factors have high influence on client-based claims, while five factors have very high influence on contractor-based claims, and 13 factors have high influence on contractors' claims.
- The most important mitigation strategies are: holding periodic progress reviews and inspections, followed by reading and understanding the contract documents.
- Significant variation does not exist among the perceptions of the stakeholders on frequency of occurrence and magnitude of claims.
- There is significant difference in the effect of factors between owners' contract claims and contractors' contract-based claims.
- The influence of contractual claims does not significantly vary among cost, time and quality performance.

RECOMMENDATIONS

The study therefore makes the following recommendations:

- Stakeholders should endeavor to prevent claims as much as possible, by placing priority on the factors having very high and high significance.
- Contractors should also be mindful of that clients can claim and avoid such pitfalls.
- All the identified mitigation strategies could be useful to stakeholders if sustainable development of properties is to be achieved. Therefore, stakeholders should adopt all strategies as much as possible.
- Particular emphasis may be placed on holding

periodic progress reviews and inspections, as well as on reading and understanding the contract

documents, which ranked as the most important mitigation strategies.

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