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Causes and Effects Of High Cost Of Construction Projects In Abuja, Nigeria

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Abstract*— The high cost of construction projects in Nigeria is very disturbing and had been an issue of serious concern to the stakeholders in the construction industry. Therefore, the study aims at establish the causes and effects of high cost of construction projects with a view of improving the project delivery in Abuja, Nigeria. The quantitative research approach was adopted through the use of questionnaire survey. One hundred and twenty (120) numbers of questionnaire was distributed to the Contractors, Quantity Surveyors, Architects, Civil Engineers and Builders in construction firms in Abuja, Nigeria. However, only ninety-five percent (95%) of thus selected professionals were able to filled questionnaire correctly and returned. The inferential statistics was adopted to analysed the data obtained from the respondents. The results obtained from the analysis were presented based on the perception of the key stakeholders in the construction firms. The results show the followings as main causes of high of construction projects namely: shortage of materials, price fluctuations, financing and payments for completed works, fraudulent practices and kick-backs, poor contract management and inaccurate estimates. In addition, the result shows the followings as major effects of high cost of construction projects in Abuja namely: abandonment of projects, delay in construction, inflation of prices of construction materials, cost overrun and project fraud and corruption. Furthermore, the result also shows the followings mitigating strategies to reduce the high cost of construction projects in Abuja namely: effective and adequate planning and packaging, proper supervision and site management, details and accurate estimate (quantity take off) before commencement of work, adequate and effective waste control on site and adequate and effective financial control on site. Therefore, the paper suggests that the management of construction firms should ensure there is need for adequate planning and management right from inception to completion stage of construction projects for effective project delivery.

Keywords— Construction firms, Construction projects, High cost, Project delivery, Mitigating strategies.

I. INTRODUCTION

The high cost of construction projects in Nigeria is a big challenge to the construction industry. This challenge sometime leads to inability to complete projects within the stipulated time and cost, total project abandonment and project failure. Nzekwe *et al* (2015) stated that the failure of projects from a cost perspective is a worrisome trend in the construction industry in Nigeria. Whereas in many cases, project cost variation is inevitable because of inflation and other unforeseen events, more often than not, poor project conception and design by themselves make it impossible to make credible estimates of the costs of materials and of the project itself. Sometimes, the ultimate cost of the project after all the variations done is several magnitudes higher than the projected cost at the beginning.

In addition, Melaye (2015) the Senate of Federal Republic of Nigeria condemns and lamented the high cost of construction in Abuja as 'exploitative'. According to Senate, both Government and construction firms had a hand in fuelling the high cost of executing construction projects in Abuja, and that construction firms have attributed the abnormality to the irregular and selective payments for executed contracts by the FCT administration despite high interest rates and further liabilities incurred by the firms. Egbo (2010) expressed his opined that construction cost can be traced to begin at the design stage and rises steadily at the production stage. At project conception, the decision of the client to build or not to build is mostly influenced by cost. Also scope of construction production is influenced by cost while, production time or construction period is based by the availability of fund. Interestingly, the production cost represents the largest single component of construction cost. It involves the irreversible commitment of fund for the purchase and use of construction resources on site. According to American Institute of Architect (AIA), (2013) asserted that construction costs are the portion of hard costs normally associated with the construction contract, including the cost of materials and the labour and equipment costs necessary to put those materials in place. Added to this are overhead costs, which include both job site management and the contractor's standard cost of doing business (office, staff, insurance, etc).

However, Nigeria has been identified as one of the countries with high cost of construction in the world.

Projects in Nigeria have been observed to cost far more than similar projects being executed in other parts of the world. Reasons for escalation in project cost include unforeseen costs which were not anticipated at the time of preparation of the original estimate (Chitkara, 1998; Marzouk & El-Rasas, 2014). It needs not be emphasized that project cost escalation is uneconomic; it is a phenomenon that could result into loss, (Dikko, 2012). Therefore, the paper aimed at evaluating the causes and effects of high cost of construction projects in Abuja, Nigeria with a view of improving project delivery.

LITERATURE REVIEW

The high cost of construction which resulted into project failure delivery is caused by ineffective construction management and poorly established cost control systems (Sriprasert, 2000; Memon *et al.,* 2012). Other factors affecting construction cost include inadequate/inefficient equipment, tools and plant, unreliable sources of materials on the local market and site accidents (Kousliki and Kartam, 2004). In a study of UK's construction industry, Olawale and Sun (2010) identified 21 major factors resulting to high cost of construction projects which include: cost overrun, design changes, risk and uncertainty associated with projects, inaccurate evaluation of project's time/duration, non-performance of subcontractors and nominated suppliers, complexity of works, conflict between project parties, discrepancies in contract documentation, contract and specification interpretation disagreement, inflation of prices, financing and payment for completed works, lack of proper training and experience of project manager, low skilled manpower, unpredictable weather conditions, dependency on imported materials, lack of appropriate software, unstable interest rate, fluctuation of currency/exchange rate, weak regulation and control, project fraud and corruption and unstable government policies. Enshassi *et al*. (2009) also conducted a similar study in Gaza and found top 10 factors causing high cost of construction projects: increment of materials prices due to continuous border closures, delay in construction, supply of raw materials and equipment by contractors, fluctuations in the cost of building materials, unsettlement of the local currency in relation to dollar value, project materials monopoly by some suppliers, resources constraint; funds and associated auxiliaries not ready, lack of cost planning/monitoring during pre-and post-contract stages, improvements to standard drawings during construction stage, design changes and inaccurate quantity take-off (Yang *et al.,* 2013; Alnaas *et al.,* 2014). Similarly, Azhar *et al*. (2008) found that five top significant factors causing high cost of construction in a large construction project are poor site management and supervision, poor project management assistance, financial difficulties of owner, financial difficulties of contractor; design changes. In a study of infrastructure projects in Nigeria, Omoregie and Radford, (2006) outline the major factors causes high cost in construction projects namely: price fluctuations, financing and payments of completed works, poor contract management, schedule delay, charges in site conditions, inaccurate estimates, shortage of material, imported materials and plant items, additional works, design changes, subcontractors and nominated suppliers, weather, no adherence to contract conditions, mistakes and discrepancies in contract conditions and fraudulent practices. The telecommunication projects in a similar ways study conducted by Ameh *et al.* (2010) indicated that seven top factors were deemed responsible for high cost of construction projects which include: lack of experience of contractors, cost of material, fluctuation in the prices of materials, frequent design changes, economic stability, kickbacks, high interest rates charged by banks on loans received by contractors, mode of financing, and bonds and payments as well as fraudulent practices. These identified factors are the summary part of the whole literature review on the factors causing high cost of construction projects.

EFFECTS OF HIGH COST OF CONSTRUCTION PROJECTS

High cost of construction projects have more risk of inflation and financial charges to clients and contractors, where most of that commercial loss applies to the party responsible for the causes of high cost (Ansar, *et al.,*2014). Identify the causes of high cost of construction projects at the inception is a common problem in the construction industry, which affect the project performance and reduces the potential to establish a partnership and business growth (McCord *et al.,* 2015). High cost of construction projects create conflict between the two main stakeholders, the client and the contractor, which justifies the need for scheduling control (Yang *et al.,* 2013). In addition, high cost of project causes abandonment of projects, delay in construction, cost overrun, unnecessary claim and increase the final cost of projects (Wu & Passerini, 2013). Cost overruns and schedule delays have a severe effect on the high cost of projects regardless of the organisation size (Ruqaishi & Bashir, 2015). High cost of construction projects causes delay in construction work and slow the progress of construction projects (Amoatey, *et al.,* 2015). Syed Jamaluddin *et al.*, (2014) conducted a study in Malaysia and established the followings as effect of high cost construction projects namely: decrease in quality, reduce market competition, slow payment of completed work, cash problems, loss of confident and causes projects delay

RESEARCH METHOD

This study adopted quantitative research approach via questionnaire survey to sample individuals from a population with a view towards making statistical inference about the population using the sample

(Groves *et al.,* 2009; Vogt, *et al.,* 2012). To pull out stakeholders and professionals in the construction industry opinion, such as beliefs, perception, ideas, views and thought about the causes and effects of high cost of construction projects in Abuja. In order to obtain the require population for this study, the stratified sampling technique was adopted for the selection of the construction firms that participated in this study. This selection was in line with concept of Creswell & Tashakkori (2007) that respondents are arranged in strata for the convenience in questionnaire distribution and assessment. In this case, the strata are client, consultant and contractors. Although, the selection of construction firms was based on the annual turnover, construction firm's capacity and frequency of firm's involvement in construction projects execution. Since the units of measurement are stakeholders and professionals in the construction firms, therefore, simple random sampling was adopted in each of the construction firms for the selection of construction stakeholders and professionals from the strata.

The questionnaire that was used to record the responses of each respondent contained mainly closed ended questions using a five- point Likert scale ranged from very high, High, slightly high, Low and None. The scores of the respondents were computed based on the variables used in the questionnaire. One hundred and twenty (120) numbers of stakeholders and professionals were selected from the construction firms in Abuja amely: Contractors ten (10) numbers, Quantity Surveyors thirty (30) numbers, Architects thirty (30) numbers, Civil Engineers twenty-five (25) numbers and Builders twenty-five (25) numbers. However, only ninety-five (95) numbers of those selected professionals were able to returned their questionnaires, while five percent (5%) of questionnaires were ignored for incorrect entry.

The inferential statistic was adopted to summarise the sample, rather than use the data to learn about the population and sample. The mean score was used to ranked the respondents' opinions or responses obtained.

RESEARCH METHOD

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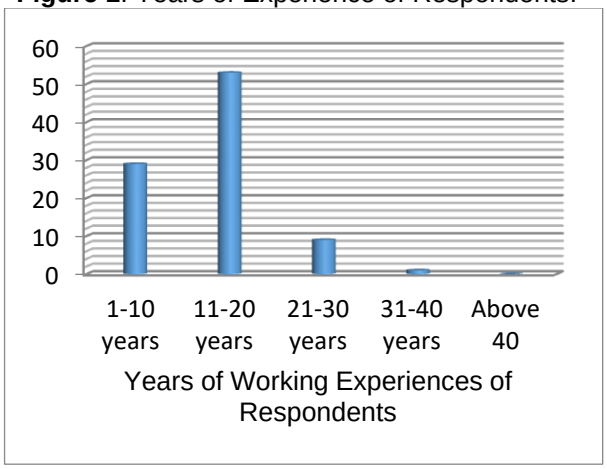
FINDINGS AND DISCUSSION OF RESULTS

The results of the demographic profile of the respondents that participated in this research work were presented in section 4.1 to 4.3 respectively.

Years of Working Experiences of the Respondent's

Figure 1 indicates that 31.52% of respondents had 1-10 years of experience, 57.60% had 11-20 years, 9.78% had 21-30 years, 1.09% had 31-40 years and 0% had Above 40 years of experience respectively. Inferences drawn from this was that the respondents sampled were knowledgeable enough to comprehend the contents of the questionnaires, thus provide suitable responses.

Figure 1: Years of Experience of Respondents:



Educational Qualifications of the Respondent's

Figure 2 indicates that 14.13% of respondents had National Diploma, 31.52 % were holders of Higher National Diploma (H.N.D) and Bachelor of Sciences (B.Sc.), 20.65% of respondents had Post Graduate Diploma (P.G.D),30.43% of respondents had Masters of Sciences (MSc/MTech) and 3.26% of respondents had Philosophy of Doctorates (PhD) respectively.

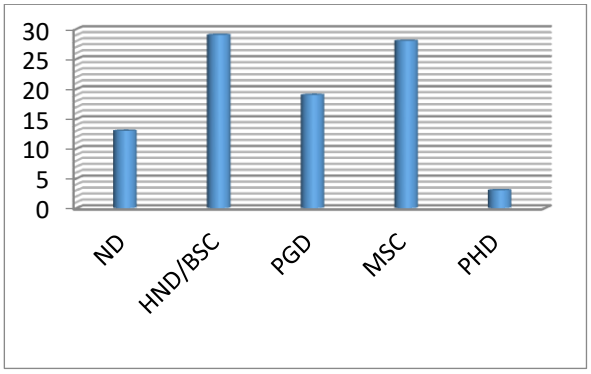


Figure 2: Educational Qualifications of Respondent:

Types of Respondents

Figure 3 shows 25% of respondents are Quantity Surveyors, likewise, 25% of respondents are Architects, and 20.83% are Builders, with 12.5% of respondents are Civil Engineers. In addition, 8.33% of the respondents are contractor, the same with client representatives. This reflect that these respondents are the targeted group for this study based on their areas of professionalism and specialization in the construction industry.

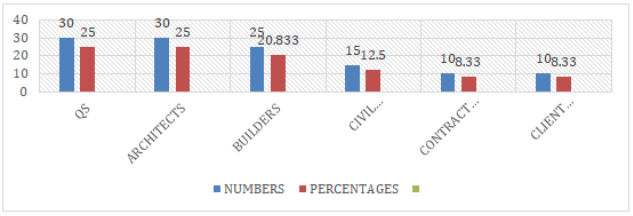


Figure 3: Types of respondent used for this study. (Field Work, 2020)

Causes of High Cost of Construction Projects in Abuja

The causes of high cost of construction projects was evaluated and presented in Table 1. *However, the decision rules used to rank the mean scores are as follows: (1) 0.00 to 1.49 represent None; (2) 1.5 to 2.49 represent Low; (3) 2.5 to 3.49 represent Slightly High; (4) 3.5 to 4.49 represent High and (5) 4.5 to 5.0 represent Very High.*

Table1: Causes of High Cost of Construction Projects

Causes	Mean scores	SD	Ranks	Remarks
Shortage of materials.	4.89	1.10	1	Very High
Price fluctuations.	4.83	1.08	2	
Financing and payments for completed works.	4.74	0.78	3	
Fraudulent practices and kick-backs	4.67	1.16	4	
Poor contract management	4.65	1.12	5	
Inaccurate estimates	4.62	1.01	6	
Imported materials	4.58	1.14	7	
Additional work	4.53	0.98	8	
Delays	4.51	1.23	9	
Design changes	4.47	1.03	10	High
Non-adherence to conditions of contract	439	1.24	11	
Labour supply	4.33	1.06	12	
Labour management relations	4.25	1.21	13	
Mistakes during construction	4.05	1.15	14	
Disputes	3.96	1.00	15	

Subcontractors and nominated suppliers	3.86	0.95	16	
Transportation of materials and equipment	3.78	1.08	17	
Changes in foundation and rock conditions	3.64	1.11	18	
Shortening of contract period	3.53	1.20	19	
Weather	3.41	1.11	20	Slightly High
Mistakes and discrepancies in document	3.37	1.26	21	
Negotiations and obtaining of contract	3.22	1.15	22	
Preparation and approval of shop drawings	3.09	1.01	23	
Approval of test samples of materials	2.93	1.27	24	
Items manufactured on off-site	2.86	.92	25	
Inspection and testing of completed portions of work.	2.74	1.08	26	

Source: Field Work, (2020)

Table 1 shows the followings as main causes of high cost of construction projects in Abuja namely: shortage of materials, price fluctuations, financing and payments for completed works, fraudulent practices and kick back, poor contract management, inaccurate estimates, imported materials, additional works, and delay. These were ranked 1st 2nd 3rd 4th 5th 6th 7th 8th & 9th with the followings mean score of 4.89, 4.83, 4.74, 4.67, 4.65, 4.62, 4.58, 4.53 & 4.51 respectively.

However, the followings were considered slightly high as causes of high cost of construction projects in Abuja namely: weather, mistakes and discrepancies in documents, negotiations and obtaining of contract, preparation and approval of shop drawings, approval of test samples of materials, items manufactured on off-site and inspections and testing of completed portions of works. These were ranked 20th, 21st, 22nd, 23rd, 24th, 25th, & 26th with the followings mean score of 3.41, 3.37, 3.22, 3.09, 2.93, 2.86 & 2.74 respectively. This result was in agreement with Omoregie and Radford, (2006) that the major factors of high cost in construction project were price fluctuations, financing and payments of completed works, poor contract management, schedule delay, charges in site conditions, inaccurate estimates, shortage of material, imported materials and plant items, additional works, design changes, subcontractors and nominated suppliers, weather, no adherence to contract conditions, mistakes and discrepancies in contract conditions and fraudulent practices (Olawale and Sun, 2010; Sambasivan *et al.,* 2017).

The Effects of High Cost of Construction Projects in Abuja

The effects of high cost of construction projects was evaluated and presented in Table 2. *However, the decision rules used to rank the mean scores are as follows: (1) 0.00 to 1.49 represent None; (2) 1.5 to 2.49 represent Low; (3) 2.5 to 3.49 represent Slightly High; (4) 3.5 to 4.49 represent High and (5) 4.5 to 5.0 represent Very High.*

Table 2: Effects of high cost of construction projects in Abuja

Variables	Mean scores	SD	Ranks	Remarks
Abandonment of project	4.83	0.79	1	Very High
Delay in construction	4.76	0.97	2	
Inflation of prices of construction materials	4.72	1.02	3	
Cost overrun	4.68	1.00	4	
Project fraud and corruption	4.61	1.20	5	
Increase in project cost	4.59	1.05	6	
Increase in the final cost of the project	4.53	0.96	7	
Change in the scope of the project	4.50	0.87	8	
Disputes between client and contractor	4.42	1.21	9	High
Unnecessary claim	4.38	1.22	10	
Cash flow and financial difficulties faced by contractors	4.27	1.14	11	
Slow payment of completed work	4.14	1.22	12	
Increased overhead	3.97	0.96	13	
Inflation of Prices	3.94	1.20	14	
Lead to litigation	3.94	1.32	15	

Loss of confident in the contract thereby jeopardizing the reputation of contractor in the case of the total abandonment of the project.	3.84	1.11	16
Threat to construction industry and people Aspiring to own houses	3.74	1.22	17
Additional revenue for the contractor	3.74	1.19	18
Reduce market competition	3.65	1.28	19
Decrease in the quality of the work	3.58	1.42	20
Reduction of employment opportunity	3.39	1.11	21
Reduction in the standard of living	3.23	0.98	22
Quality standard affected	3.13	1.04	23

Source: Field Work, (2020).

Table 2 shows the followings as main effects of high cost of construction projects in Abuja namely: abandonment of project, delay in construction, inflation of price of construction materials, cost overrun, project fraud and corruption, increase in project cost, increase in the final cost of the projects and change in the scope of the projects. These were ranked 1st, 2nd, 3rd, 4th, 5th, 6th, 7th, & 8th with the followings mean score of 4.83, 4.76, 4.72, 4.68, 4.61, 4.59, 4.53 & 4.50 respectively. This finding agrees with the finding of Khyomesh, (2011), *Aysha*, *et al* (2015), Mbachu and Nkado (2004) where it discovered the effect of high cost on construction projects as discussed in literature review chapter. This includes: inflation impact on construction industry activities, reduction of investment profit, wastes national finance, litigation, and increases of construction cost. Syed Jamaluddin *et al.*, (2014) conducted a similar study in Malaysia and agreed with the findings by outline the following as effect of high cost construction projects namely: decrease in quality, reduce market competition, slow payment of completed work, cash problems, loss of confident and causes projects delay.

4.6 Mitigating Strategies to Reduce High Cost of Construction Projects

The client perception on mitigating strategies for high cost of construction projects was presented in Table 1. *However, the decision rules used to rank the mean scores are as follows: (1) 0.00 to 1.49 represent None; (2) 1.5 to 2.49 represent Low; (3) 2.5 to 3.49 represent Slightly High; (4) 3.5 to 4.49 represent High and (5) 4.5 to 5.0 represent Very High.*

Table 3: Mitigating strategies to reduce high cost of construction projects

Mitigating Measures	Mean Scores	SD	Ranks	Remarks
Effective and adequate planning and packaging	4.19	1.09	1	High
Proper supervision and site management	4.16	0.93	2	
Details and accurate estimate (quantity take-off) before commencement of work.	4.10	1.10	3	
Adequate and effective wastes control on site	4.06	1.13	4	
Adequate and effective financial control on site	4.03	1.23	5	
Use of appropriate forms of contract	3.98	1.04	6	
Incorporation of risk management and cost control requirement in the tendering process	3.86	1.13	7	
Comprehensive articulation, coordination and communication between the consultants and contractors	3.75	1.24	8	
Comprehensive/details design for complex projects before commencement of work	3.64	1.26	9	

Directing of the sub- contractors properly to ensure they know what is expected of them in relation to the project	3.52	1.09	10	
Following due process in awarding contract	3.47	1.11	11	Slightly
Utilization of indigenous contractors and consultants	3.34	0.82	12	High
Adequate availability of labour	3.25	1.04	13	
Ensuring clear distinction between a design change and a design development at the outset of project.	3.12	1.13	14	
Adequate provision of construction cost data	2.94	1.06	15	
Establish risk analysis process specifically for a complete work or activities in a project	2.87	1.14	16	

Source: Field Work, (2020).

Table 3 shows the followings as main mitigating strategies to reduces high cost of construction projects in Abuja namely: effective and adequate planning and packaging, proper supervision and site management, details and accurate estimate (quantity take off) before commencement of work, adequate and effective waste control on site, adequate and effective financial control on site, use of appropriate form of contract, incorporation of risk management and cost control requirement in the tendering process comprehensive articulation, coordination and communication between the consultants and contractors, comprehensive detail design for complex project before commencement of work, and directing of the sub-contractors properly to ensure they know what is expected of them in relation to the projects. These were ranked 1st, 2nd, 3rd, 4th, 5th, 6th, 7th, 8th, 9th, & 10th, with the followings mean score of 4.19, 4.16, 4.10, 4.06, 4.03, 3.98, 3.86, 3.75, 3.64 & 3.52 respectively. This finding agrees with the findings of Giwa, (1988), Li and Shen, (2002), Ibrahim, (2012), Arah (2012) and Anago (2012) where it was discovered the most effective ways of mitigating the high cost of construction projects namely: Availability of adequate labour, an effectiveness of financial control on construction site, adequate wastes control on construction site, sustainable development, and involvement of Quantity Surveyors in engineering projects.

5 Conclusion

The high cost of construction project has been a serious concern to the management of construction firms and the clients in Abuja. In spite of the efforts by the previous researchers to address the issues in different ways. The problems of high cost of construction projects continues to increases on daily basis due to lack of adequate research to address the challenges. It was on the basis of the above mentioned that this paper evaluates the causes and effects of high cost of construction projects in Abuja. And from the findings, the paper established the followings as main causes of high cost of construction projects in Abuja namely: (1) shortage of materials, (2) price fluctuations, (3) financing and payments for completed works, (4) fraudulent practices and kick-backs, (5) poor contract management, (6) inaccurate estimates, (7) imported materials, (8) additional works and (9) delay. In addition, the followings were established as major effects of high cost of construction projects in Abuja namely: (1) abandonment of projects, (2) delay in construction, (3) inflation of prices of construction materials, (4) cost overrun, (5) project fraud and corruption, (6) increase in project cost, (7) increase in final cost of the project and (8) change in the scope of the project. Furthermore, the followings were also established as major mitigating strategies to reduce the high cost of construction projects in Abuja namely: (1) effective and adequate planning and packaging, (2) proper supervision and site management, (3) details and accurate estimate (quantity take off) before commencement of work, (4) adequate and effective waste control on site, (5) adequate and effective financial control on site, (6) use of appropriate form of contract, (7) incorporation of risk management and cost control requirement in the tendering process, (8) comprehensive articulation, coordination and communication between the consultants and contractors, (comprehensive/ details design for complex projects before commencement of work and (10) direct sub-contractor properly to ensure they know what is expected of them in relation to the projects.. The paper therefore, concludes that the stakeholders of construction firms in Abuja contributes directly or indirectly to the causes and effects of the high cost of construction projects in Abuja. Consequently, the paper suggests that the management of construction firms should ensure there is need for adequate planning and management right from inception to completion stage of construction projects for effective project delivery. In addition, the management of construction firms and Government should ensure

that mitigating measures are strictly adherence to, in order to reduce the effects of high cost of construction projects.

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