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Identifying The Important Effects Of Delays On Road Construction Projects In Abuja

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Abstract

This paper aims to identify the important effects of Delays on Road construction projects in Abuja. Public projects play a major role on the economic life and standard of living of the people because of its significant contribution to the Gross Domestic Product. To achieve the objectives of the study, Quantitative data was obtained by administration of Ninety (90) structured questionnaires and Qualitative data from interview of key management personnel and professionals in the Construction industry. Eighty (80) questionnaires were correctly filled and returned. The collected data were analyzed using descriptive data analysis techniques along with the relative importance index. The study lead to the findings on the effects of delays on construction projects which included time overruns, rescheduling, cost overruns, disputes, late completion of projects, loss of productivity, third party claims, arbitration, litigation, and negative effects on company reputation, termination and outright abandonment of project in worst cases. Based on the findings, the study recommends improved project management and administration, regular project monitoring and evaluation, effective strategic planning and scheduling, effective communication between all stakeholders and also better financial management system in order to mitigate such delays in road construction.

Keywords: *Delays, Delay Effects, Relative Important Index, Construction, Management, Projects.*

1.0 Introduction

Delay is an event that causes extended time to complete all or parts of a project. According to Assaf and Al-Hejji (2006), construction delays refer to the time overrun in completion or delivery of project beyond the date on which parties have agreed or the project specified completion date. According to Owolabi et al (2014), construction delay may also be defined as the time overrun, either beyond the date of completion specified by the contract or beyond the extended contract period where an extension of time has been granted.

Road infrastructural projects are famous for delays, cost overruns and abandonment in most developing countries of the world Singh, (2010), Sambasivan and Soon (2007). Delay is a global phenomenon affecting the economic fortunes of countries all over the world as huge resources are pumped daily into construction infrastructural projects Aftab, (2014). In Nigeria, it is not significantly different as concluded by Owolabi et al (2014).

Few projects in Nigeria get delivered on schedule without delay. The second River Niger Bridge at Onitsha, with its ancillary roads,, was awarded to the construction giant Julius Berger Nigeria Limited at a construction cost of N 117,860,700,741.82 Billion, VAT inclusive, with a completion period of 48 months (Federal Ministry of Works & Housing 2013). The bridge construction was flagged off by former President Goodluck Jonathan on 14th. March 2014.The project was scheduled for completion in 2018. The project was only partially opened to traffic on December 15th, 2022, more than four years behind schedule, even though the ancillary roads are yet to be completed. The extent, causes and effects behind construction delays remain understudied and undefined, hence this study was instituted to close some of the gaps.

A project can be classified as successful if it is completed within the stipulated time and cost (Majid, 2006). The success of a project is also assessed on its ability in achieving the objectives of the project. However, it is rare for a construction project to be completed within contractual time and cost as in most cases, a huge amount of delay occurs. Delays and cost overruns are critical issues frequently faced by the construction projects worldwide (Murray & Seif, 2013). In Indonesia for example,

Trigunarsyah (2004) reported that only 47% of projects were completed within schedule, 15% were completed ahead of schedule, and 38% were behind schedule.

Delays have significant implications from the economic and political points of view as posited by Faradi and El-Sayeh, (2006) because of its contribution to the GDP. In Nigeria, the construction industry contributes 3% to the National GDP (National Planning Commission (NPC, 2020) from NBS' Data on National Account. It is therefore in the interest of all to avoid delay, or at best reduce and mitigate these delays should they occur at all. Due to delays in project implementation, people have to wait for the provision of goods and services longer than is expected. The services provided by infrastructural projects are key imputes for other sectors and delays in these projects leads to an increase in the capital output for the Nigerian economy (Ogunde et al, 2017). Put differently, delays reduce the efficiency of the available economic resources, limit the growth potentials and reduce the competitiveness of the economy. At least for now, most road infrastructural projects in Nigeria are funded by tax payers' money (National Bureau of Statistics 2021). Hence, tax payers have the right to know how efficiently or otherwise their money is being utilized by the government in providing for the public goods and services. Indeed, limited or no research on the subject is somewhat surprising and so reflects a gross neglect of an important public policy subject. A literature scan on the subject further reveals that the underlying causes and remedies defer from country to country. Hence, very little can be learnt from the international experience, thus, further underscoring the need for a systemic Nigerian based study Ogunde et *al*, (2017). This study will demonstrate experience and knowledge in international literature, and also evaluate the effects of delays on road infrastructure projects observed in the Federal Capital Territory, Abuja. The following two features set this study apart. Firstly, it is based on by far the largest dataset on completed road projects. Secondly, it examines the effects of delays from a holistic point of view as it affects all team players in construction.

2.0 Literature Review

Effects of delays are the consequences that often result when the causes of delays are not identified and worked on effectively and timely (Pourrostam and Ismail, 2011). Construction delays are very problematic, often resulting in time overrun, cost overrun, disputes, litigation, and complete abandonment of projects (Sambasivan and Soon, 2007). Furthermore, construction delays cost consequences for the contractor such as standby costs of non-productive workers, supervisors, and equipment, expenses caused by disrupted construction and material delivery schedules and additional overhead costs. . On the other hand, Aibinu and Jagboro (2002) studied the effects of construction delays on project delivery in Nigerian construction industry and identified that time overrun was one of the major effects of construction delays.

Pourrostam and Ismail (2011) identified and ranked the effects of construction project delays as follows:

2.1 Time overrun:

When the agreed completion time is pushed forward, the project is said to have experienced schedule overrun (Sunjka and Jacob,2013). In most cases, the main causes for the delay are financial problems, late payments for the completed work and on-going work, change orders, organizational changes etc. This was further supported by the study by Aibinu and Jagboro (2002) on the effects of construction delays on project delivery in Nigerian construction industry.

2.2 Rescheduling/Disruption of work

According to Vieira *et* al. (2003), rescheduling is the change of original schedule of time in order to respond to disruption and problems which have occurred. In the construction industry, schedules may be updated in order to monitor the time and work in construction projects (Liu and Shih, 2009). The importance of schedule updates as mentioned by Liu and Shih (2009) include:

i. Comparing the original schedule with the actual progress of the project;
ii. Identify all delayed activities;
iii. Identify who or what is responsible for delays; and
iv. Forecast and modify projected work progress based on actual progress.

Based on the scheduled update, delayed activities can be identified and usually, rescheduling is required due to the delayed work. Thus, rescheduling is one of the effects of delay in construction projects.

2.3 Cost overrun:

When a project is completed at a cost higher than what was budgeted, it is said to experience a budget overrun (Sunjka and Jacob,2013). Kikwasi (2012), identified critical factors that cause cost overruns in construction projects as changes in scope of work on site, incomplete design at the time of tender, contractual claims (extension of time with cost), lack of cost planning and monitoring of funds, delays in costing variations and additional works. Furthermore, according to Pourroustam and Ismail (2011), cost overruns can be traced back to “root causes" that are often associated with the preliminary phases, project planning or design, that such root causes include; poor estimation of quantities, design variations or errors, project schedule changes, scope changes, unexpected site conditions, rising costs of materials and labour (largely due to inflation), and or unforeseen events. The main causes of the cost overrun are change orders, mistakes in the contract, changes in drawings etc.

2.4 Disputes:

Disputes and claims arise because of the losses incurred through schedule overruns (Sunjka and Jacob, 2013). Disputes normally come down in assessing three aspects of overruns: whose fault was it or who caused the overrun, how much delay occurred and, consequently, what monetary awards should be made. The main causes of disputes are slow or late payments for completed or ongoing work, client interference, labour issues, change in requirements, distribution of work, less communication within parties, subcontractor issues etc. (Motaleb and Kishk, 2010).Furthermore, if the dispute cannot be solved amicably or easily, it can lead to arbitration or litigation.

2.5 Arbitration:

Change in order, mistakes or discrepancies in contract document and lack of communication between various parties among others factors may give rise to disputes which will be settled through

arbitration process. In these circumstances, it is necessary to have a competent third party that can settle the disputes amicably or easily without going to court.

Sunjka and Jacob, 2013), states that projects would have extra costs and time consequences related to the engagement of professional arbitrators in cases of disputes that go through arbitration.

2.6 Litigation:

Disputes, due to schedule overruns, can lead to court cases for resolution especially when large penalties are at stake (Sunjka and Jacob, 2013). Haseeb et al (2011), defines litigation as negotiations that involve going to court to solve the problems. In most cases, it takes a long time to solve the problems. The main causes are late or no payments for completed work or on-going work and change order. The parties involved in the construction projects use litigation as a last alternative to settle the disputes.

2.7 Late completion of projects

According to Majid (2006), delay in construction may result in late completion of project since disruption in scheduled activity or a deviation from planned and actual progress if left unattended to for long will affect future planned items. If for example a substructure construction is not finished on schedule, it shall definitely affect the schedule for the superstructure works.

2.8 Loss of Productivity

Delay affects the economy of nations because of its contribution to the Gross Domestic Product of most nations (Faradi and El-Sayeh, 2006). This occurs due to acceleration of the schedule and also the pressure to complete the work. In addition, delays caused by construction mistakes will need rework and this leads to a significant increase in the amount of work the labourers are required to complete. This directly reduces the productivity and efficiency of the working labourers. Therefore a delay in project completion leads to losses in the productivity which has negative affect on the economy. This is also posited by Ogunde et *al*, 2017 in his study on productivity and economy.

2.9 Third Party Claims

Arguments and disagreements usually arise between project parties when delay occurs because of the higher costs, longer schedule and other problems it creates for the contracting team (Majid, 2006). This is more complex when the contract does not provide for settlement of liquidated damages or other explicit contractual obligations of parties to the contract.

2.10 Termination of Contract.

Excessive delays and non-performance or underperformance with respect to the specifications spelt out in the conditions of contract may give rise to termination of a contract. This may arise from disputes on the issue of cost, expected completion time and many other factors (Majid, 2006).

2.11 Company Reputation

According to Ismail *et al* 2006, company reputation is one of the most important intangible assets and reputation which is built from the overall performance of the company. The reputation of a company is very important because an adversely affected reputation can become a business threat (Murray, 2003). Strategic planning, corporate governance and corporate codes of conduct are the top three factors that affect company's reputation according to the study conducted by Ismail et al. (2006). Thus, delay in construction projects will affect the company reputation indirectly.

2.12 Total Project Abandonment:

The most critical adverse effect of construction delays on construction projects is abandonment that could be temporary or in worse conditions total abandonment. The major causes of construction delays may lead to project abandonment. Aibinu and Jagboro (2002) studied the effects of construction delays on project delivery in Nigerian construction industry and identified total abandonment as a critical factor.

Schedule overruns in project execution could lead to total abandonment if issues leading to the delay are not resolved timeously (Sunjka and Jacob, 2013). The main causes of abandonment are organizational changes, regulatory changes, finances and payments and natural disasters. Many large

construction projects are temporarily or permanently abandoned due to financial crisis, natural disasters and organizational changes.

These findings are in general agreement with the studies done by Aibinu and Jagboro (2002) and Motaleb and Kishk (2010). However, Denini (2012) identified thirteen effects that come with delay, these include: cost overrun; time overrun; contractual disputes; decrease in the owner's financial commitment; acceleration; claims; reduction in quality; negative social impacts; reduction in safety; litigation; arbitration; contract termination and total project abandonment. Saleh, Abdelnaser and Abdul (2012) noted that construction delays have the following Impacts on construction projects: loss of interest by the stakeholder; blacklist by authorities; waste of money and time and declination of reputation. Delays in project execution could lead to total abandonment if issues leading to the delays are not resolved timeously. Kikwasi (2012),identified fourteen effects of delays and ranked them as follows; time overrun, cost overrun, negative social impact, idling resources, disputes, arbitration, delaying by the client to return the loans, poor quality of work due to hurrying the projects, delaying in getting profit by clients, bankruptcy, litigation, create stress on contractors, total abandonment and acceleration losses. The services provided by infrastructural projects are key imputes for other sectors and time overruns in these projects leads to an increase in the capital output for the Nigerian economy (Ogunde et al, 2017). Put differently, delays and time overruns reduce the efficiency of the available economic resources, limit the growth potentials and reduce the competitiveness of the economy.

A literature scan on the subject further reveals that the underlying causes and remedies defer from country to country. Hence, very little can be learnt from the international experience, thus, further underscoring the need for a systemic Nigerian based study Ogunde et al, (2017).

3.0 Research Methodology and Analysis of Data

The data used for this research comprises both Primary and Secondary data. The instrument of data collection employed is the questionnaire. The collection instruments were targeted at obtaining useful information on the effects of delays on construction projects. The questions were drawn based on the research questions, aims and objectives and information from literature reviewed and archival records.

The primary data was obtained through the use of a structured questionnaire survey. This was distributed to a total of 90 construction professionals that included; Civil Engineers, Architects, Builders, Quantity Surveyors, Construction Mangers and Project managers who are currently involved in construction works in Abuja. This yardstick was considered vital for the survey in order to have a true and holistic reflection of the effects of construction project delays. Out of the 90 questionnaires sent out, 80 were received back representing 88.89% response rate which was considered adequate for the analysis.

Table 1: Target Population

Institution/Agency		Class of Staff	Population size		
			Garki	Asokoro/Guzape	CBD/Gudu
Engineering	Dept. Towns	Management staff	6	9	4
Dev.Agency and Satellite		Engineers, Builders and Managers Technologists	38 5	23	5
Total			49	32	9
Grand Total					90

Source: FCDA Admin Department (2023)

Table 2: Questionnaire Administered and Retrieved

Questionnaires	Frequency	Percentage(%)
Number returned	80	88.89
Total	90	100

Source: Field Survey (2023)

Table 3: Respondents' Profile

S/N	Variable	Option	Frequency (No)	Percentage (%)
1.	Gender:	a)Male	54	67.5
		b)Female	26	32.5
		Total	80	100
2.	Highest Qualification of Respondents	a)ND	5	6.25
		b) HND/BSc	57	71.25
		c) MSc/MEng	15	18.75
		d)PhD	3	3.75
		Total	80	100
3.	Years of experience of Respondents	a)0-5yrs	0	0
		b)6-10yrs	6	7.5
		c)11-15yrs	21	26.25
		d) Over 15yrs	53	66.25
		Total	80	100

Source: Field Survey, (2023)

The findings from the 80 properly filled questionnaires retrieved from the respondents are presented in Table 4. The result of the data analysis from the profile of the respondents shows that a greater percentage of the respondents were males (67.5%) while only 32.5% were females. The result also revealed that a greater percentage of the respondents (71.25%) had HND/BSc as their highest qualification. However, 18.75% of the respondent had MSc/MEng degree; 6.25%had ND while only 3.75% of the respondents had PhD.

With regard to the experience of the respondents under the study area, a larger percentage of the respondents are quite experienced, having worked for over 15 years (66.25%) in the construction industry. This is followed by those who have spent between 11-15yrs (26.25%), an indication that a larger percentage of the respondents have spent a reasonable number of years as construction graduate professionals to gve reliable information on the delay factors.

Findings relating to respondent's work professional qualifications results showed that the management cadre respondents, comprising of mainly Civil Engineers and Builders constituted 21.11% while the middle level officers comprising of Civil Engineers, Builders, Architects and Quantity surveyors put together made up 73.33% of the respondents. The technologists were a mere 5.56% of the respondents. The respondents were asked to rank the effects of construction projects delays in Abuja. The mean and Relative Importance Index method were used to determine the relative importance of the various effects of delays. The five-point likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) was adopted and transformed to relative importance indices (RII) for each factor. This has previously been used in similar studies (Sambasivan and Soon, 2007; Fallahnejad, 2013) using the following relation:

RII=□W/SA*N

Where, W is the weighting given to each factor by the respondents ranging from 1(strongly disagree) to 5 (strongly agree), SA is the highest weight (i.e.5 in this case), and N is the total number of respondents. The RII value had a range from 0 to 1 (0 not inclusive), the higher the value of RII, the more important was the effect of the delay factor.

The data presentation and analysis made use of frequency distributions and percentages of all the respondents. The ranking made it possible to cross compare the relative importance of the items as perceived by the respondents. After mathematical computations, the factors were then ranked using the value of RII as shown in table 4.

Effects of delays on Construction projects in Abuja

Table 4: Ranking of the Effects of delay in construction projects

S/N	Factors	Weighting/Response Frequency									
		1	2	3	4	5	(Σf)	Σfx	MEAN	RII	RANK
1	Time overrun	16	30	9	5	20	80	223	2.788	0.558	1st
2	Rescheduling	19	32	4	20	5	80	200	2.50	0.50	4th
3	Cost overrun	22	31	4	5	18	80	206	2.575	0.515	2nd
4	Disputes	13	38	15	2	12	80	202	2.525	0.505	3rd
5	Loss of Productivity & Efficiency	31	20	7	6	16	80	196	2.45	0.49	5th
6	Litigation	15	40	5	14	6	80	196	2.45	0.49	5th
7	Arbitration	17	36	5	19	3	80	195	2.438	0.488	7th
8	Third party Claims	21	45	4	5	5	80	168	2.10	0.42	10th
9	Termination of Contract	30	21	9	14	6	80	185	2.313	0.463	8th
10	Company Reputation	35	24	5	2	14	80	176	2.20	0.44	9th
11	Total Abandonment	41	26	5	4	4	80	144	1.80	0.360	11th

Source: Field Survey (2023)

Where:1=Strongly disagree,2=Disagree,3=Undecided,4=Agree,5=Strongly agree

4.0 Summary of Findings

Time overruns($\overline{X} = 2.788; RII = 0.558, R = 1$)was ranked most highly by the respondents. This has proven that time overrun is the most singular effect of delays on construction projects. This is because when the project is delayed, the project will definitely exceed the original contract duration. The next in ranking is cost overruns($\overline{X} = 2.575; RII = 0.515$;R=2),which results when

the client and even the contractor end up trying to source extra funds for the project because of the delay.Disputes$s(\overline{X} = 2.525$;RII=0.505;R=3)is the third most ranked factor, normally fuelled by breach of trust and suspicion from parties to the contract. The 4th in that order is Rescheduling/Disruption of work($\overline{X} = 2.5; RII = 0.5$;R=4),which is a common feature that results when project managers try to reschedule work breakdowns and deliverables in order to respond to project delay. Loss of productivity and efficiency ($\overline{X} = 2.45; RII = 0.49; R = 5$) is ranked 5th. Litigation (x =2.45;RII=0.49;R=5)is equally ranked same, while,Arbitration($\overline{X} =$ 2.438;RII=0.488;R=7),Termination of contract($\overline{X} = 2.313; RII = 0.463;$ R=8) and company reputation (X =2.20;RII=0.44;R=9),are ranked 7th, 8th and 9th respectively. Third Party claims (; ($\overline{X} = 210$;RII=0.42;R=10) and Total Abandonment($\overline{X} = 1.80; RII = 0.360$;R=11) are ranked 10th and 11th.While Late completion of projects ($\overline{X} = 1.738$;RII=0.348;R=12), in that last order, complete the ranking of the most significant effects of delays on construction projects in Abuja. The findings were similar to the results in the earlier studies reviewed where time overruns and cost overruns were identified as the major effects of construction project delays.

5.0 Conclusion and Recommendation

Delays on Construction give rise to serious effects on a project. Most significant of these from the findings are time and cost overruns, disputes, rescheduling/ disruption of work, loss of productivity and efficiency, litigation, arbitration, termination, company reputation, third party claims and outright abandonment in worst cases.

The negative effects of delays in project execution often occur. This is because of the uniqueness of projects execution which involves a combination of people, time and place. People's capacities and capabilities are not the same, and time and places for project execution are different. It is therefore difficult to avoid delays completely. However, efforts must be made to mitigate delay to achieve efficient project delivery.

The following are therefore recommended to mitigate the negative effects of project delays:

i. Improved project management and administration
ii. Regular project monitoring and evaluation
iii. Effective strategic planning and scheduling of project deliverables must be carried out and analysed before project commencement.
iv. Effective communication between all project stakeholders
v. Accurate initial cost estimation should be done as well.
vi. Engagement of only qualified and certified project managers to handle projects.
vii. Strengthening of all contract award Procurement processes and procedures and finally,
viii. Engagement of only competent contractors to handle projects in order to mitigate these negative effects.

References

Aftab H. M (2014). Contractor Perspective On Time Overrun Factors In Malaysian Construction *Projects, International Journal of Science Environment and Technology, Vol* 3,pg. 1184-1192.Assaf, S.A. and S. Al-Hejji, (2006). Causes of delay in large construction projects. *International Journal of Project Management.* 24(4):p.349-357.

Aibinu, A. A., and Jagboro, G. O. (2002). The effects of construction delays on project delivery in Nigerian construction industry, *International Journal of Project Management, 20* (8), 593-599.

Denini, F. (2012). Causes, effects and methods of minimizing delays on large construction projects in Libya. *6th International Conference and Workshop on the Built Environment in Developing* Countries, Adelaide, Australia.

Fallahnejad, H. Mohammed (2013) Delay causes in Iran gas and pipeline projects. *International journal of projects.*

Faridi A. S, and El-Sayegh S. M. (2006). Significant factors causing delay in the UAE construction industry. *Construction Management Econ* 24(11):1167-76.

Haseeb, M.,Xinhai-Lu, Aneesa Bibi, A., Maloof-ud-Dyian, and Rabbani, W. (2011). Causes and Effects of Delays in Large Construction Projects of Pakistan. *Kuwait Chapter* of *Arabian Journal of Business and Management Review,* Vol. 1, No.4.

Ismail, A., Aftab, H. M., and Ahmad T. A. (2013) Significant Factors causing cost overruns in large construction projects in Malaysia, *Journal* of *Applied Sciences,* 13 (2), 286-293.

Kikwasi, G.J.(2012). Causes and Effects of Delays and Disruptions in Construction Projects in *Tanzania. Australasian Journal of Construction Economics and Building, Conference Series 1*(2),52-59

Liu S.S. and Shih K.C. (2009). Construction Rescheduling Based on a Manufacturing Rescheduling Framework, Automation in Construction.18(6)pp.715-723

Majid,I. A. (2006). "Causes and effect of delays in Aceh construction industry." *Master's thesis, Univ. of Technology Malaysia, Johor Bahru, Malaysia.*

Motaleb, O. and Kishk, M. (2010). An investigation into causes and effects of construction delays in UAE. *Proceedings of 26th Annual ARCOM Conference, Leeds, UK: Association of Researchers in Construction Management,* 1149-1157

Murray, M., & Seif, M. (2013). Causes of project delays in Nigerian construction industry. *European Journal of Civil Engineering and Architecture,10(1),1-7.*

Ogunde, Dafe, Akinola, Ogundipe, Oloke, Ademola, Akueta and Olaniran, (2017). Factors militating against Prompt Delivery of Projects in Lagos Megacity, Nigeria: Contractors' Perspective. Mediterranean *Journal* of *Social Sciences.* MCSER Publishing, Rome Italy.

Owolabi James D, Amusan Lekan M; Oloke C.O.; Olusanya O; Tunji Olayemi P.; Owolabi Dele;Peter Joy and Onuh Ignatius (2014). Causes and Effects of Delays on Construction delivery time.*International Journal of Educational Research,* Vol 2, No *4.*

Pourrostam, T. and Ismail, A. (2011).Significant Factors Causing and Effects of Delay in Iranian Construction *Projects. Australian Journal of Basic and Applied Sciences,* 5(7)*:* 450-456.

Saleh, Abdelnaser and Abdul (2012). Causes of Delay in Construction Industry in Libya. The *international Conference on Economics.*

Sambasivan, M., and Soon, Y. W. (2007). "Causes and effects of delays in Malaysian construction industry." *International Journal of Project Management,25(5):*p.517-526

Singh, R. (2010) Delays and cost overruns in infrastructure project: Extent, causes and remedies, *Economics and Political Weekly, 45* (21),43-54.

Sunjka, B.P. and Jacob, U. (2013). Significant causes and effects of project delays in the Niger delta region, Nigeria. *SAIIE25 Proceedings: Stellenbosch, South Africa*

Trigunarsyah, B. (2004). "Constructability practices among construction contractors in Indonesia. "Journal *of Construction Engineering Management.,130(5),656-665*

Vieira G.E., Herrmann J.W. and Lin E. (2003): Rescheduling Manufacturing System: A Framework of Strategies, Policies and Methods, *Journal* of *Scheduling.* 6, pp. 39-62