

# Management of Construction Delays in South East Nigeria

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## Abstract

Timely completion of construction projects and the position in certain quarters that construction delays are almost unavoidable made it imperative to examine the management of construction delays with South East Nigeria as case study. In the study, 3 research questions with 43 multiple choice items were formulated and administered to 100 construction professionals who have been involved in construction projects in South East Nigeria to elicit responses through a questionnaire. The questionnaire was constructed using Likert Four-Point Scale Response Alternative and analysed using weighted mean. The study also sourced for information through observations and oral interviews conducted by the researchers. The study found out that extra cost claims, professional negligence labour and material cost escalation among others are the causes of construction delays in Nigeria. It also found out that cost overrun, time overrun, damaged relationship between the parties and the like are effects of construction delays in South East, Nigeria. On management of these delays when they occur, the respondents accepted that appointment of a project quantity surveyor, prompt release of funds to contractor, timely purchase of material and immediate delivery on site among others are remedial actions. Of essence in the study is the discovery by the researchers that most clients are willing to honour payment certificates as and when but lack the financial capacity to do so. Thus, the researchers among others recommend the financial empowerment of clients to ease timely honouring of payment certificates; and the appointment of project quantity surveyors for financial guidance.

**Keywords:** construction delays, construction projects, cost overrun, management and time overrun

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## 1. INTRODUCTION

Being labelled a clock-watcher might not be desirable but troubles await any party to a construction contract who is not a clock-watcher. Braimah (2013) stated that delay claims are now a major source of conflict in the construction industry and also one of the most difficult to resolve. It is a common knowledge that executing construction projects is very complex and requires effective and efficient management of resources namely money, machine, man, materials, and the like. This is as a result of so many uncertainties in the management of construction projects. These uncertainties among others include client's cash flow for the project, unpredictability of government policies especially in third world countries, insecurity (terrorism, militancy, secessionist agitations, etc.), poor communication network and incomplete information on construction source documents. These construction source documents include among others working drawings, bill of quantities, weather forecast report and geotechnical investigation report. With the afore-listed uncertainties, delay in the execution of construction projects is a major risk that should not be lightly handled.

Morrissey (2016) stated that delay is almost inevitable in the execution of construction projects and thus, should be properly managed. Delay in construction occurs when the construction project is completed beyond the initially agreed date. It is an obstruction that interrupts the progress of construction projects. To Mishra (2017), construction delays are considered as time lag in completion of activities from its specified time as per contract or can be defined as late completion or late start of activities to the baseline schedule, directly affecting specified cost. He also stated that understanding delay and its effects is crucial to the successful completion of construction projects. To the client, delay means non availability of construction resources and lost revenue as such cannot be recovered. To the contractor, delay means higher direct and overhead cost because of the extended period of construction time with working capital tied up so that he may be prevented from pursuing other contracts. Generally, in the construction industry, delay is one of the common causes of criticisms in the industry.

From the above, it can be deduced that both parties are not comfortable with delay in construction works as it usually involves loss to them. One can also deduce that construction delay is an ill wind that does no good to any of the parties to a contract. As such, every construction business must holistically address this menace called delay.

Given the above, the study seeks to provide answers to the following questions:

1. What are the causes of construction delays in South East Nigeria?
2. What are the effects of construction delay in South East Nigeria?
3. To what extent is construction delay managed in South East Nigeria?

## 2. REVIEW OF RELATED LITERATURE

### 2.1 Causes of Construction Delay

Wersyn (2016) stated that design professional liability for construction delay and extra cost claims can arise based on any of several theories identified as unexpected conditions, inadequacy of predesign investigation, errors, omissions, and inconsistencies in the plans and specifications, changes to the plans and specifications, deficiencies in providing clarification, interpretation, or shop drawing review, delays in review and acceptance of completed work and communication breakdowns. Mishra (2017) categorized causes of construction delay into four major types namely – critical or non-critical delays, excusable and non-excusable delay, concurrent delay, and compensable or non-compensable delays. He itemized the causes of these categorized construction delays as extended field overhead, unabsorbed home office overhead, liquidated damage, idle labour and equipment cost, labour and material cost escalation, etc. (*critical or non-critical delays*); force majeure, natural calamities, political/social unrest, terrorist attacks, delayed approval/decision making by client (*excusable delay*); delayed mobilization of resources, procurement, submission of important documents planning/scheduling and critical events not timely highlighted to the client by the contractor (*non-excusable delay*). Non-excusable delay was experienced by Groenenaal (2017) who stated that he did not complete a project because the contractor failed to implement common project management techniques. Designing Buildings Ltd. (2018) stated that concurrent delay refers to the complex situation where more than one event impacts on the completion date at the same time; however, the contractor is not entitled any claim for loss and expense or extension of time as a result the events preceding the construction delay. Mishra (2017) stated that compensation delays arise in a scenario where the contractor is liable for extension of time and compensation of cost incurred while a scenario where the contractor is solely at fault is a non-compensable delay to the client. Designing Buildings Ltd. (2018) added that compensation events in construction delays deal with an allocation of risk and not an allocation of blame. She also added exceptionally adverse weather, civil commotion, national strikes, changes in statutory requirements, statutory undertaker's work etc. as construction delays resulting from neutral causes. On his part, Raymond (2014) stated construction delays arises as a result of changes in the project; stressing that the best way out is to avoid changes in the project.

### 2.2 Effects of Construction Delay

Studies reviewing the effects of construction delay clearly depict that there are social and financial negative consequences. These effects retard the growth of the construction industry. A study of Ramabodu & Verster (2010) showed that the effects of construction are time and cost overrun as construction projects require additional workload. According to them, the effect prevent parties to the construction contract from achieving set targets and objectives and would likely damage the relationship between them. Odeh (2002) attributed construction delays to varied opinions of the client and contractor stressing that requirements of either or both parties are not met. Though almost inevitable as asserted by Morrissey (2016), construction delay is a major risk in the execution of construction projects. Owolabi, Amusan, Oloke, Olusanya, Tunji- Olayeni, Owolabi, Peter & Omuh (2014) are of the view that delays instigates damaging effects on construction projects. Their study identified the effects of delay construction to include reduced profit, dispute between the parties, arbitration, project abandonment, wastes and under-utilization and increased costs. Other effects are litigation between parties, revenue loss, loss of productivity, tying of client's capital and determination of contract. The findings of Aibinu & Jagboro (2002) revealed that the effects of construction delays on project delivery are frequently hinged on time and cost overruns. They also added dispute, arbitration, litigation and total abandonment as effects of construction delays. Haseeb, Xinhai-Lu, Bibi, Maloof-ud-Dyian & Rabbani (2011) categorized the effects of construction delay and stated that the effects fall within contractor's liability and client's liability. They are of the view that the overlapping nature of these effects makes it difficult to differentiate which of the parties should be attributed to an effect. For instance, when there is loss in revenue, the client is losing value for money while the contractor is experiencing loss of profit. So, one cannot say the effect of construction delay is loss of revenue without attributing it to either the client or the contractor. Haseeb (etal) further identified the effects of construction delays to include dispute, negotiation, lawsuit, total desertion, litigation and abandonment. They tenaciously held that effects of delays are different for either party and concluded that consequences of construction delay are loss of wealth, time and capacity.

### 2.3 Management of Construction Delay

Management is the effective and efficient coordination of the available resources to accomplish set goals and objectives. It is also a human action, including design, to facilitate the production of useful outcomes from a

system. Henri Fayol (1841 – 1925) in Krenn (2011) considered management theory to comprise of planning, organizing, commanding, coordinating and controlling an organization's initiative to accomplish a goal. It is obvious that management intertwines organization's policy formulation functions and organizing, planning, controlling, and directing of the resources of the organization to achieve strategic objectives. The main focus of this study is management of construction delays.

Indhu & Ajai (2008) are of the view that construction delays can only be minimized. They also stated that not all delays can be rectified, but few of them can be overcome by improving management responsibilities, avoiding lethargic attitude of management team, appointment of a quantity surveyor, prompt release of funds to contractor, timely purchase of material and immediate delivery on site, etc. In the analysis of existing delay, Braimah (2013) opined that a reliable approach for managing construction delays would involve using dynamic multiple time periods or windows which would be capable of tracing changes in the critical path; and that construction managers would have to agree on time interval to be used. Zack (2000) is of the view that the pace of a project work can be decelerated by either of the parties to the contract, due to a delay caused by the other party. In his view, it is sensible for a party to slow down the working pace if a delay by other party makes it unnecessary for fast working.

On their parts, Haseeb et al (2011) suggested timely imbursement of funds to the contractor by the clients so as to reduce economic burden and liability of contractor. They also suggested that change in drawing during site operations must diminish. According to them, the contractor must have updated knowledge of his resources and their efficiency level to avoid unnecessary delay in construction project delivery. They are of the view that modern, skilled and experienced workforce will drastically reduce construction delays; and that clients must have faith on contractors in addition to using advanced technology and having political instability. Raymond (2014) is of the view that avoiding changes in project is the best practice for avoiding construction delays. He also opined that the contractor should be in control of construction means, methods, sequences, procedures, and coordinating the work while the client should be in control of project's scope, budget and duration. In other words, the client should decide what will be built, how much to be spent on the project and when the project will be completed. More so, the client should allocate delay risks to the understanding of the contractor. He concluded by stating that construction delays should be analyzed as they occur and resolved immediately.

### 3.0 RESEARCH METHODOLOGY

A survey research was adopted for the study. Questionnaire comprising 3 research questions with 43 multiple choice items was administered to 100 construction professionals who have been involved in construction projects in South East Nigeria. The questionnaire was administered by the researchers who also collected them back on completion. This ensured 100% return of questionnaires administered. The questionnaire was constructed using Likert Four-Point Scale Response Alternative and analysed using weighted mean. The formula for calculating the Weighted Mean is shown below:

$$\bar{X} = \sum FX / N$$

Where:  $\bar{X}$  = Weighted Mean,  $\sum$  = Summation,  $F$  = Frequency,  $X$  = Nominal Value of Options and  $N$  = Number of Respondents.

Nominal values were assigned to six scaling items as follows:

Strongly Agree (SA) = 4, Agree (A) = 3, Disagree (D) = 2, Strongly Disagree (SD) = 1 and Void (unfilled options) = 0.

The Mean of each cluster was also calculated using the formula below:

$$\bar{X} = \sum X / N$$

Where:  $\bar{X}$  = Cluster Mean,  $\sum$  = Summation,  $X$  = Nominal Value of Mean of Each Option in a Cluster and  $N$  = Number of Cluster.

To determine the Mean cut-off point of the study, the nominal values were added up and the Mean calculated as shown below:

$$\begin{aligned} \text{Mean} &= (4+3+2+1+0)/4 \\ &= 10/4 \\ &= 2.50 \end{aligned}$$

An interval scale of 10% was added to the Mean of the nominal value. Thus:

$$2.50 + 10\% \times 2.50 = 2.75$$

The decision point is 2.75. Therefore, the decision rule of acceptability was 2.75 points and above while points below 2.75 were rejected.

The researchers also conducted oral interviews on 20 construction clients who were not able to honour payment certificates as and when due. They also made some observations. Just like the questionnaire, the outcome of the oral interview and observations served as primary data for the study.

#### 4. RESULTS

This section deals with the presentation of the data obtained from the study and results. It also reveals the summary of the information obtained from the respondents to whom questionnaires were administered. The data are presented in tables based on the research questions.

**Table 1: The weighted mean of respondents' views on the causes of construction delays in South East Nigeria**

S/N	Description	SA (4)	A (3)	D (2)	SD (1)	Void (0)	Mean	Remarks
1.	Extra cost claims	100	225	0	0	0	3.25	ACCEPT
		<b>25</b>	<b>75</b>	<b>0</b>	<b>0</b>	<b>0</b>		
2.	Professional negligence	152	72	50	13	0	2.87	ACCEPT
		<b>38</b>	<b>24</b>	<b>25</b>	<b>13</b>	<b>0</b>		
3.	Unexpected conditions	152	147	0	13	0	3.12	ACCEPT
		<b>38</b>	<b>49</b>	<b>0</b>	<b>13</b>	<b>0</b>		
4.	Inadequacy of predesign investigation	0	150	76	6	0	2.47	REJECT
		<b>0</b>	<b>50</b>	<b>38</b>	<b>6</b>	<b>6</b>		
5.	Errors in construction contract documents	0	150	100	0	0	2.50	REJECT
		<b>0</b>	<b>50</b>	<b>50</b>	<b>0</b>	<b>0</b>		
6.	Inconsistencies in the plans and specifications	152	75	50	12	0	2.89	ACCEPT
		<b>38</b>	<b>25</b>	<b>25</b>	<b>12</b>	<b>0</b>		
7.	Changes to the plans and specifications	100	150	50	0	0	3.00	ACCEPT
		<b>25</b>	<b>50</b>	<b>25</b>	<b>0</b>	<b>0</b>		
8.	Deficiencies in providing clarification	0	75	150	0	0	2.25	REJECT
		<b>0</b>	<b>25</b>	<b>75</b>	<b>0</b>	<b>0</b>		
9.	Wrong interpretations of drawings	100	150	26	12	0	2.88	ACCEPT
		<b>25</b>	<b>50</b>	<b>13</b>	<b>12</b>	<b>0</b>		
10.	Repeated reviews of designs and constructed works	152	114	48	0	0	3.14	ACCEPT
		<b>38</b>	<b>38</b>	<b>24</b>	<b>0</b>	<b>0</b>		
11.	Communication breakdowns	152	39	74	12	0	2.77	ACCEPT
		<b>38</b>	<b>13</b>	<b>37</b>	<b>12</b>	<b>0</b>		
12.	Delays in review and acceptance of completed work	0	75	126	12	0	2.13	REJECT
		<b>0</b>	<b>25</b>	<b>63</b>	<b>12</b>	<b>0</b>		
13.	Labour and material cost escalation	200	114	24	0	0	3.38	ACCEPT
		<b>50</b>	<b>38</b>	<b>12</b>	<b>0</b>	<b>0</b>		
14.	Force majeure	152	39	50	13	0	2.86	ACCEPT
		<b>38</b>	<b>13</b>	<b>25</b>	<b>13</b>	<b>11</b>		
15.	Political/social unrest/terrorist attacks	152	114	26	11	0	3.03	ACCEPT
		<b>38</b>	<b>38</b>	<b>13</b>	<b>11</b>	<b>0</b>		
16.	Changes in statutory requirements	76	114	50	13	0	2.67	REJECT
		<b>19</b>	<b>38</b>	<b>25</b>	<b>13</b>	<b>5</b>		
17.	Delayed approval/decision making by the client	52	189	26	11	0	2.78	ACCEPT
		<b>13</b>	<b>63</b>	<b>13</b>	<b>11</b>	<b>0</b>		
18.	Delayed mobilization of resources and procurement	88	114	50	13	0	2.71	REJECT
		<b>22</b>	<b>38</b>	<b>25</b>	<b>13</b>	<b>2</b>		
19.	Non submission of important documents	0	75	100	25	0	2.00	REJECT
		<b>0</b>	<b>25</b>	<b>50</b>	<b>25</b>	<b>0</b>		
20.	Failure of the contractor to implement common project management techniques	60	189	26	9	0	2.84	ACCEPT
		<b>15</b>	<b>63</b>	<b>13</b>	<b>9</b>	<b>0</b>		
21.	Critical events not timely highlighted	100	114	50	12	0	2.76	ACCEPT
		<b>25</b>	<b>38</b>	<b>25</b>	<b>12</b>	<b>0</b>		
<b>Grand Mean</b>							2.78	ACCEPT

From the analysis of Table 1, the respondents accepted items 1 – 3, 6 – 7, 9 – 11, 13 – 15, 17, 20 - 21. They rejected items 4 – 5, 8, 12, 16 and 18 – 19. With an acceptable grand mean of 2.78, it the respondents are of the view that generally, the afore-listed items are the causes of delay in Nigeria. Thus, the findings are in tandem with the positions of Wersyn (2016) who identified inconsistencies in the plans and specifications, changes to the plans and specifications, interpretation, or shop drawing review, delays in review and acceptance of completed work and communication breakdowns. However, the respondents disagreed with Wersyn (2016) on deficiencies

in providing clarification, inadequacy of predesign investigation, errors in construction documents and delays in review and acceptance of completed works. The respondents also disagreed with Mishra (2017) and Designing Buildings Ltd. (2018) who respectively stated that delayed mobilization of resources and changes in statutory requirements are causes of delay. Designing Buildings Ltd. (2018)'s and Mishra (2017)'s positions on causes of delay as force majeure, escalation of construction resources were supported by the respondents alongside the view of Groenald (2017) who stated that he did not complete a project because the contractor failed to implement common project management techniques.

**Table 2: The Weighted Mean of Respondents' Views on the Effects of Construction Delays in South East Nigeria**

S/N	Description	SA	A	D	SD	Void	Mean	Remarks
1.	Time overrun	200	114	24	0	0	3.38	ACCEPT
		<b>50</b>	<b>38</b>	<b>12</b>	<b>0</b>	<b>0</b>		
2.	Cost overrun	300	75	0	0	0	3.75	ACCEPT
		<b>75</b>	<b>25</b>	<b>0</b>	<b>0</b>	<b>0</b>		
3.	Damaged the relationship between the client or the contractor including their representatives	0	264	24	0	0	2.88	ACCEPT
		<b>0</b>	<b>88</b>	<b>12</b>	<b>0</b>	<b>0</b>		
4.	Prevent parties to the construction contract from achieving set targets and objectives	0	189	50	12	0	2.51	REJECT
		<b>0</b>	<b>63</b>	<b>25</b>	<b>12</b>	<b>0</b>		
5.	Contractual requirements either or both parties are not met.	52	189	0	24	0	2.65	REJECT
		<b>13</b>	<b>63</b>	<b>0</b>	<b>24</b>	<b>0</b>		
6.	Litigation/Arbitration	100	114	50	12	0	2.76	ACCEPT
		<b>25</b>	<b>38</b>	<b>25</b>	<b>12</b>	<b>0</b>		
7.	Abandonment of project	200	75	50	0	0	3.25	ACCEPT
		<b>50</b>	<b>25</b>	<b>25</b>	<b>0</b>	<b>0</b>		
8.	Determination of contract	0	150	100	0	0	2.50	REJECT
		<b>0</b>	<b>50</b>	<b>50</b>	<b>0</b>	<b>0</b>		
<b>Grand Mean</b>							2.96	ACCEPT

The data on Table 2 show that respondents accepted items 1 – 3 and 5 – 6. In other words, they rejected items 4 – 5 and 8 as being the effects of construction delays. With a grand mean of 2.96, the respondents generally agree that there are effects of construction delays. Unfortunately, these effects are negative. This means that the respondents' views corroborate those of Ramabodu & Verster (2010) who identified the effects of construction delays as time and cost overruns. This view is also in agreement with Aibinu & Jagboro (2002). It is a common knowledge that the principal objectives of a client and contractor are getting value for money and maximization of profit respectively. Thus, with cost overrun as a major effect of construction delays, it is certain that these objectives are not met. This is very damaging and a clear justification of the positions of Odeh (2002) who stressed that with construction delays requirements of either or both parties cannot be met and Owolabi et al who stated that delays could instigate damaging effects on construction projects. Their views are also in line with the findings of Aibinu & Jagboro (2002) who added dispute, arbitration, litigation and total abandonment as effects of construction delays. Though, it has been stated earlier that the respondents agreed with Odeh (2002) on cost overrun being responsible for not meeting either client's or contractor's requirements, but their rejection of contractual requirements of either or both parties not being met as an effect of construction delays points to the fact that there are other effects outside cost and time overruns which are not the effects of construction delays.

**Table 3: The Weighted Mean of Respondents' Views on the Extent of Managing Construction Delays in South East Nigeria**

S/N	Description	SA	A	D	SD	Void	Mean	Remarks
1.	Improving management responsibilities	68	225	16	0	0	3.09	ACCEPT
		17	75	8	0	0		
2.	Appointment of a quantity surveyor	132	126	34	8	0	3.00	ACCEPT
		33	42	17	8	0		
3.	Avoiding lethargic attitude of management team	132	126	34	8	0	3.00	ACCEPT
		33	42	17	8	0		
4	Prompt release of funds to contractor	32	150	84	0	0	2.83	ACCEPT
		8	50	42	0	0		
5	Timely purchase of material and immediate delivery on site	200	126	16	0	0	3.42	ACCEPT
		50	42	8	0	0		
6	Using dynamic multiple time periods	168	99	34	8	0	3.09	ACCEPT
		42	33	17	8	0		
7	Agreement on time intervals by construction managers	68	225	0	8	0	3.01	ACCEPT
		17	75	0	8	0		
8	Diminishing of changes in drawings during site operations	100	126	50	0	0	2.76	ACCEPT
		25	42	25	0	8		
9	Contractor must have updated knowledge of his resources and their efficiency level	204	24	66	8	0	3.02	ACCEPT
		51	8	33	8	0		
10	Modern, skilled and experienced workforce	168	99	34	8	0	3.09	ACCEPT
		42	33	17	8	0		
11	Avoiding changes in project	100	201	16	0	0	3.17	ACCEPT
		25	67	8	0	0		
12	Contractor to control of construction means, methods	68	201	16	8	0	2.93	ACCEPT
		17	67	8	8	0		
13	Allocation of delay risk	200	99	34	0	0	3.33	ACCEPT
		50	33	17	0	0		
14	Immediate resolution of construction delay issues	204	99	16	0	0	3.59	ACCEPT
		51	33	8	0	8		
<b>Grand Mean</b>							3.10	ACCEPT

The data on Table 3 show that respondents accepted all the items as the extent to which construction delay is managed in South East Nigeria. The total acceptance amounts to a very high grand mean of 3.10. This agreement is in tandem with Braimah (2013), Zack (2000), Haseeb et al (2011) and Raymond (2014) as contained in the theoretical framework of the study. This entails that the positions of Indhu & Ajai (2008) are not in tandem with views of the respondents. Recall that Indhu & Ajai (2008) stated that not all construction delays are rectifiable; stressing that they can only be minimized.

**Oral Interviews and Observations:** It was discovered by the researchers that most clients are willing to honour payment certificates as and when but lack the financial capacity to do so. It was observed by the researchers that Bills of Quantities (BOQs) are excluded from the documents to be submitted by clients at development authorities before approval is granted to the clients for commencement of construction projects. The non-inclusion of BOQs has made so many clients ignorant of the actual estimated project cost. Thus, they embark on projects they are not capable of funding.

## CONCLUSION

From the study, it is very clear that delays are almost unavoidable in construction project delivery in South East Nigeria; and these delays are experienced in varying degrees. Unfortunately, the effects of these delays are not favourable to any of the parties or their representatives. With unavoidable extension of time being the most likely effect, both the client and contractor suffer high revenue loss. However, the issue here is not avoiding or preventing construction delays from occurring but managing them when they occur so as to drastically reduce the cost and time burden to the contractual parties and their respective representatives. It must be stated here that a project is considered successful when it is completed within the agreed time. This means that construction delay has been properly managed. More so, how delay is managed will define the ultimate impact, the construction business has on the clients, contractors, financiers, etc. It is also necessary to note that managing construction delay is a difficult task that requires concise understanding of the contractual rights of parties to a construction project.

## RECOMMENDATIONS

Based on the findings, the researchers made the following recommendations as a way forward in the management of construction delays in South East Nigeria:

1. Managers of the economic resources of the South East Nigeria should financially empower clients of construction projects to enable them (Clients) honour payment certificates as and when due. This can be done through giving of soft and accessible loans, grants, subsidies and the like.
2. In the event of a client is not meeting up in honouring payment certificates after appreciable interventions by the managers of the economic resources, the government through a well constituted agency should take over the management of the projects; and make necessary deductions and recoveries on completion of the project before handing it over to the original owner.
3. Clients should make allowance for sufficient time lag in construction project delivery. A situation where the critical path analysis shows a lot of zero time lags is not good for timely delivery of construction projects.
4. Clients should engage the services of quantity surveyors throughout the life cycle of any project. The governments in the South East should see to this.
5. Clients should bear the total cost of construction project delays caused by force majeure. The idea of sharing the cost with contractor should be jettisoned. No contractor will comfortably and happily bear a loss caused by circumstances outside his control; more so, when he is not entitled to any profit after construction. For goodness sake, the construction project belongs to the client.

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