

CAUSES AND EFFECTS OF DELAY ON BUILDING PROJECT IN ABUJA

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Abstract

Delay in construction project is considered one of the most common problems causing a multitude of negative effect on the project and its participating parties. Therefore, it is essential to identify the actual causes of delay in order to minimize and avoid the delays and their corresponding expenses. The specific objectives are to: Examine the cause of delays on construction projects completion in Nigeria, Identify and assess the effects of delays on construction projects, Identify and establish the relevant ways of eliminating or mitigating the delays on Construction projects, develop a model for mitigating the causes and effects of delay on projects. A questionnaire was drawn up and was divided into sections. The research questionnaire was administered to selected construction professionals in Abuja, this study identifies, by questionnaire evaluated and through empirical method assesses the effects of construction delays. The findings showed that time and cost overruns were frequent effects of delay. Construction delay has become endemic in Nigeria and have significant effects on completion cost and time. Acceleration of site activities coupled with improved client's project management procedure and inclusion of appropriate contingency allowance in pre contract estimate should assuage the adverse effect of construction delays.

Keywords: *Contingency, Cost Overrun, Mitigate, Model. Project delays.*

1.0 Introduction

A major criticism facing the Nigerian construction industry is the growing rate of delays on project delivery. Delay is a situation when the contractor and the project owner jointly or severally contribute the non-completion of the project within the original stipulated or agreed project period (Aibunu and Jagboro2002). Construction delays are one of the major issues facing the construction industry across the globe and it affects project delivery in terms of time, budget and the required quality (Shebob2012). In Countries such as United States of America (USA), United Kingdom (UK) and Germany (Moobs2009) found that 'construction time' is better. Whereas in Nigeria, (Ajanlekoko2002) observed that the performance of the construction industry with respect to completion time is poor. It is very important for both public and private projects to be completed on time and within budgets. Normally, achieving the projects within predetermined time, budget and quality is the basic purpose of construction project control.

Project delays have been one of the most prevailing problems in construction projects in Nigeria. This delay has its impact on project delivery. It appears the industry currently lacks the require capacity and capability to meet national construction demand. As a result, many construction projects have suffered a suspension, delay or outright abandonment. For instance, in 2015, Government identified about 56,000 construction projects that have been abandoned as a result of delays and these projects have been estimated to require about N12trn to complete

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Makun Mojibola.J. and Ganiyu Bashir.O (2019 CAUSES AND EFFECTS OF DELAY ON BUILDING PROJECT IN ABUJA.

Collaboration for Sustainable Development in the Built Environment. International Conference of Environmental Sciences, ICES 2019. 1st International Conference of the Faculty of Environmental Sciences, University of Ilorin, Nigeria, 29th - 30th April 2019.

across the Six Geopolitical Zones in the country (Hamisu and Zakariyya, (2015). Presently, there is high demand for construction projects and the government over the years has expended and still spending huge amount in the construction sector in an attempt to meet the infrastructure deficit the country is experiencing. However, it has become a norm to make budgetary allocations on a yearly basis for these projects such as roads, railways, hospitals, schools, residential and non-residential buildings and airports by government many of which get suspended or delayed for many reasons such as poor funding and so on.

Furthermore, as a result of delay or incompleteness of projects, contractors are persistently losing jobs. Against this background and considering the economic hardships experienced by the government, business organizations, contractors, consultants, community and the construction industry as whole as a result of delays, it has become essential that further study is conducted to ascertain the effects of delay on construction projects and strategies that could be adopted in mitigating the occurrence of delays.

The purpose of this paper therefore is to model the effects of delays on construction projects with a view to making suggestive solutions to the problems of delays.

The specific objectives are to: Examine the cause of delays on construction projects completion in Nigeria, to identify and assess the effects of delays on construction projects to, identify and establish the relevant ways of eliminating or mitigating the delays on construction project and to develop a model for mitigating the causes and effects of delay on projects.

2.0 Literature Review

Finance, which is a major cause of delay is directly related to the conference sub theme “Financial, cost analysis, and modelling for sustainable buildings”. Construction delay is considered to be one of the most recurring problems in the construction industry and it has an adverse effect on project success in terms of cost, time, quality, and safety. There are several factors that causes delay in construction. Delay may be caused by clients, users, consultants, designers, owners, contractors and suppliers (Divya and Ramya 2015).

Ogunlana et al (1996) studied the delays in building projects in Thailand, as an example of developing economies. They concluded that the problems of the construction industry in developing economies could be rested in three layers : (1) Problem of shortages or inadequacies in industry infrastructure, mainly supply of resources. (2) Problems caused by clients and consultants. (3) Problems caused by incompetence of contractors. . They were classified as sources and causes of delays into six groups:

Table 2.1 Causes of Delay

	Factors	Causes
1	Owner related factor	<ul style="list-style-type: none"> • Change order • Slow decision making
2	Design related factor	<ul style="list-style-type: none"> • Incomplete drawings • Low response
3	Construction manager/Inspector related factor	<ul style="list-style-type: none"> • Deficiencies in organisation • Deficiencies in coordination • Uncompromising attitude
4	Contractor related factors	<ul style="list-style-type: none"> • Materials management • Planning and scheduling problem • Equipment allocation problems • Financial difficulties • Inadequacy of site supervision
6	Other factors	Confined site <ul style="list-style-type: none"> • Problems with neighbours • Slow permit by government agencies.

Source: Ogunlana et al. (1994)

Table 2.2: Causes of Delays

	Group	Causes
A	Project group	<ul style="list-style-type: none"> • Design changes • Preparation and approval of drawings
B	Owners group	<ul style="list-style-type: none"> • Award project to lowest bid • Progress payment delay • Design changes
C	Materials and equipment group	<ul style="list-style-type: none"> • Equipment availability and failure • Shortage in material
D	Labourers group	<ul style="list-style-type: none"> • Labour supply
E	External group	<ul style="list-style-type: none"> • Poor ground condition • Natural Disaster • Political situation
F	Design group	<ul style="list-style-type: none"> • Design changes • Inappropriate design
G	Contacting and Consultant group	<ul style="list-style-type: none"> • Poor site management • Improper planning • Problems with subcontractors • Inadequate experience • Delay in contractors progress

Source: Divya and Ramya (2015).

Effect of Construction Delays

The effects of construction delays on project construction industry as identified by Murali Sambasivam et al (2015) are: Time overrun, Cost overrun, Dispute, Arbitration, Total abandonment.

3.0 Research Methodology

Data was sourced through the distribution of questionnaires, interview and archival data. The target respondents were qualified and registered construction professionals identified from the various professional bodies in both private and public, consulting and contracting firms within the federal capital whom the researcher believes has first-hand information on things happening in building construction sites and also gives a fair representation of the participant in the Nigerian construction industry. The simple random sampling technique was used to obtain information and other archival data was also obtained in respect of Nigerian information on building projects which were completed within a given time frame and the study uses both descriptive and inferential statistics for data analysis.

4.0 Data Analysis And Research Findings

Table 4.1: Type of Organization

Type of Organisation	Number	Percent (%)
Client (<i>government or developer</i>)	18	32.73
Contractor	11	20.00
Consultant	11	20.00
Others	15	27.27
Total	55	100

Table 4.2: Position Of Respondents In The Organization

Position	Number	Percent (%)
Engineer/Designer	15	27.27
Project Manager	14	25.45
Site Manager	10	18.18
Others	16	29.09
Total	55	100

Table 4.3: Years Of Experience Of Respondents

Years of Experience	Number	Percent (%)
Less than 5 years	3	5.45
5 to 15	40	72.73
Above 15 years	12	21.82
Total	55	100

Table 4.5: Type of Projects That Experienced Delay

Project	Number	Percent (%)
Building	42	76.36
Civil Engineering	6	10.91
Others	7	12.73
Total	55	100

Table 4.7: Actual Time Spent On Delayed Project

Project	Number	Percent (%)
Less Than 3 Months	4	7.27
3 To 6 Months	13	23.64
Above 6 Months	38	69.09
Total	55	100

Table 4.1: Client Related Causes

Variables	RII	Rank
Client's financial problems.	0.92	1
Delay in decision-making by the client.	0.91	2
Poor communication and coordination between clients and the project team.	0.90	3
Changes in the scope of the work by the client.	0.89	4
Delay in settlement of the main contractor's claims by the client.	0.88	5
Unreliable contract duration.	0.88	5
Selection of the lowest not the best bidder by the client.	0.84	7
Changes in design by the client.	0.84	7
Delay in paying the main contractors by the client.	0.84	7
Delays in giving possession of the site to the main contractors.	0.82	10

Source: Researcher's Data Analysis (2018)

Table 4.2: Contractor Related Causes

Variables	RII	Rank
Delay in supply of construction materials.	0.87	1
Delay in getting licenses and approvals from the government by the main contractor.	0.87	1
Inadequate experience by the main contractor.	0.84	3
Lack of skilled management team.	0.84	3
Main contractor poor financial condition.	0.83	5
Arguments between the main contractor and the consultant.	0.81	6
Inadequate site management by the main contractor.	0.81	6
Low productivity of the main contractor workforce.	0.81	6
Unskilled workforce by the main contractor.	0.80	9
Delay in mobilization by the main contractor.	0.79	10
Poor cost estimation by the main contractor	0.79	10
Poor construction planning by the main contractor.	0.77	12
Inappropriate methods of construction.	0.77	12
Insufficient number of workers.	0.73	14
Lack of the incentives for the workers.	0.73	14
Lack of well-being facilities by the main contractor.	0.67	16
Poor coordination by the main contractor.	0.65	17
Delayed salary payments to the main contractor's staff.	0.61	18
Shortage of equipment on site.	0.59	19

Source: Researcher's Data ANALYSIS (2018)

Table 4.3: Consultant Related Causes

Variables	RII	Rank
Misunderstanding of the client's requirements by the consultant	0.76	1
Delay in providing cost estimation for the client.	0.73	2
Delay in providing design information to the main contractor.	0.72	3
Delay in approval of drawings by the consultants.	0.72	3
Poor quality control by the consultant.	0.71	5
Slow response by the consultant to contractor's enquiries.	0.69	6
Delay in providing construction planning for the client.	0.68	7
Lack of experience by the consultant's staff.	0.68	7
Ineffective delay penalties	0.67	9
slow information flow between parties	0.66	10
Delay in site inspection by the consultant.	0.66	10

Variables	RII	Rank
inadequate definition of substantial competition	0.64	12
Poor communication/coordination between consultants and other parties	0.64	12

Source: Researcher's Data Analysis (2018)

Table 4.4: External Causes

Variables	RII	Rank
Effects of global economy/ unforeseeable financial	0.90	1
Increased cost due to high inflation during the project	0.88	2
Price fluctuation	0.85	3
Slow process of Building permit	0.85	3
Fluctuation in exchange rates	0.85	3
Control by the government and restrictions on the site.	0.83	6
Bad weather (excessive rainfall, sand storm and high temperatures).	0.82	7
Government regulation	0.82	7
Changes in government regulations and laws.	0.82	7
Inflation – increase in the price of materials and labour.	0.82	7
Inclement weather	0.81	11
Unforeseen site condition	0.81	11
Unpredictable soil conditions.	0.79	13
Act of God	0.77	14
Civil disturbance	0.76	15
Problem with neighbor	0.64	16

Source: Researcher's Data Analysis (2018)

Table 4.5: Client Related Effects

Variables	RII	Rank
Project time overrun.	0.90	1
Extra cost.	0.89	2
Abandonment (termination of contract).	0.88	3
Long-litigation with the parties.	0.87	4
Arbitration.	0.84	5
Reduction in project quality.	0.84	5
Reduced investor's confidence towards the project.	0.84	5
Disputes with the other parties.	0.80	7

Source: Researcher's Data Analysis (2018)

Table 4.6: Main Contractor Related Effects

Variables	RII	Rank
Abandonment (termination of the contract).	0.87	1
Loss of the reputation on construction services.	0.85	2
Extra cost.	0.85	2
Arbitration.	0.85	2
Decreased opportunities for future work	0.84	5
Long-litigation with other parties.	0.84	5

Source: Researcher's Data Analysis (2018)

Table 4.7: Consultant Related Effects

Variables	RII	Rank
Abandonment (termination of the contract).	0.90	1
Loss of reputation on consulting services.	0.87	2
Arbitration.	0.85	3
Decreased opportunities for future work.	0.84	4
Long litigation with other parties.	0.84	4

Source: Researcher's Data Analysis (2018)

Table 4.8: Mitigating Strategies by The Client

Variables	RII	Rank
Engage experienced contractors and consultant.	0.97	1
Awarding bids to the best contractor not to the lowest bidder.	0.97	1
Ensure availability of the funds.	0.96	3
Efficient contract management.	0.96	3
Specify a realistic contract period for the contractor.	0.96	3
Develop a reliable procurement process.	0.93	6
Efficient coordination with the other parties.	0.92	7

Source: Researcher's Data Analysis (2018)

Table 4.9: Mitigating Strategies by the Contractor

Variables	RII	Rank
Efficient site management and supervision.	0.88	1
Efficient construction planning by the main contractor.	0.87	2
Increase work shifts to increase productivity.	0.87	2
Timely response to the consultant instructions.	0.87	2
Efficient quality management system.	0.86	5
Speed up the site activities by the use of the sub-contractors.	0.86	5

Source: Researcher's Data Analysis (2018)

Table 4.10: Mitigating Strategies by The Consultant

Variables	RII	Rank
Efficient internal approval.	0.86	1
Timely response to contractor's inquiries	0.85	2
Efficient inspection system process.	0.84	3

Source: Researcher's Data Analysis (2018)

4 Discussion of Findings

The study set out to model the effects of delays on building construction projects in Abuja, Nigeria. In a quest to achieve the research aim, several objectives were identified and analysed using both descriptive and inferential statistical methods.

The first objective of the study was to examine the causes of delay on construction projects completion in Nigeria. The causes which were divided into four (4) categories namely; client related causes, contractor related causes, consultant related causes and external causes were ranked and analysed using the relative important index (RII). Findings revealed that the first category of the causes which is client related causes projected from analysis carried out revealed that "clients' financial problems" was the most important cause of delay in completing construction project while "delays in giving possession of the site to the main contractors" was the least important cause. The findings are in agreement with Chan and Kumarasamy (1997), Sambasivam and Soon (2006) and Aibinu and Odeyinka (2006) who in their study have listed the client related characteristics leading to delay in completing construction projects. The second category which is contractors' related revealed a number of causes. Findings revealed that "delay in supply of construction material" was rated the most significant cause while "shortage of equipment on site" rated least though causes delay in completing construction projects. The findings agree with Odeh and Battaineh (2002), Aibinu and Odeyinka (2006) and Abdulrahman *et al* (2001) who in their study revealed contractors related causes that impedes the completion of most construction projects. Consultants' related factors formed the third category of causes of delay in completing construction projects. Interestingly, "misunderstanding of clients' requirement by consultants" ranked the most significant amongst other causes. This reveals that there is a communication gap between the consultants and clients of most construction project therefore leading to delay in completing construction projects. The fourth category which was defined as external causes revealed other factors impeding the completion of construction projects. Findings from analysis revealed that "effects of global economy/ unforeseeable financial" turned out to be a significant cause leading to delay in completing construction projects. This depicts that stability and boom in the global economy have a great effect on construction project and a downslide in the global economy could lead to delay in complementing projects.

The second objective of the study focused on the effects of delay on construction projects. Out of the several effects identified from this study three (3) prominent categories were chosen and subsequently analysed. The first category identified was client related. Findings from analyses revealed numerous effects but ranked “project time overrun” as the most severe effect while “disputes with other parties” ranked as the least effect. The second category defined the effects in terms of the contractor. It revealed that “abandonment (termination of the contract)” ranked as the most severe effect in relation to delay in completing construction projects. This implies that the continuous delay in completing construction projects may affect the contractors’ cash flow this in turn may lead to the contractor absconding from site. The third category of effect was channelled toward consultants. Findings revealed the consultants related effects to be numerous but rated “abandonment (termination of the contract)” as the most severe. It revealed that delay in completing construction projects may lead consultants to abscond from construction site. The subject of delay has been addressed by several researchers and they found that delay always led to negative effects. When projects are delayed, they are either accelerated or have their duration extended beyond the scheduled completion date.

The third objective centered on the relevant ways of eliminating or mitigating the delays on construction projects. In order to achieve the research objective, mitigating strategies for clients, contractors and consultants were identified and analysed. Findings revealed several mitigation factors for clients. The most prominent among them being “engage experienced contractors and consultant” while the least prominent strategy was “efficient coordination with the other parties”. This implies that for a client to be able to mitigate delay factors on site, there is a need to engage the best hands in the field so as to ensure efficiency while at the same time ensure there is coordination in the construction team. Furthermore, to mitigate delay as a result of contractor related factors, several strategies were identified and analysed. Findings revealed that “efficient site management and supervision” ranked importantly as a strategy to be adopted in mitigating delay on construction project. This will essentially ensure that material wastage on site is reduced to the barest minimum thereby saving time and cost on construction projects. However, to mitigate consultants related factors, several other strategies were identified. One of the strategies which rated the most was “efficient internal approval”. Other strategies such as “timely response to contractor’s inquiries” and “efficient inspection system process” were also identified. The findings further revealed that efficient and prompt approval internally and process of inspection should be given topmost priority by consultants. It also revealed that untimely response to consultants often leads to delay and therefore as a mitigating strategy, prompt and timely responses should be given to enquiries made by contractors.

5.1 Conclusions

Generally, this study has been able to explore the causes and effects of projects delay. The consequences of delays in building construction projects are always negative thus delay Should be avoided at all cost, once the factors that causes delay has been identified. The already

identified delay factors can then be traced to their possible causes that are due to either contractor, consultants, clients, environmental, government or others. With all this resolution method put in place it will be easier to identify whoever is at fault. From our findings, time overrun and extra cost are some of the impact of construction delay, it is necessary therefore to reconsider the mechanism of selecting the main contractor. It is vital to ascertain the availability of funds. Experienced and capable hands should be appointed on site, in order to attain maximum efficiency.

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