

A Critical Literature Review on the Factors Causing Delays, Failures and Abandonments of Construction Infrastructure Projects

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ABSTRACT

Globally, construction infrastructural projects are on-going on daily basis as their relevance to human existence cannot be over emphasized. However, the construction projects encounters several challenges that led to their delays, failures and abandonments which subsequently affected their level of completion and overall output in Nigeria and globally. This study shows the review of literature in the field of Project and Construction Management with focus on the aforementioned factors between 2016 and 2021. Findings from this study indicated that, quite a large number of infrastructural projects are affected by these factors in the past and are still largely prevalent throughout the Project Life Cycle (PLC) and further posited that in every project, these factors plays a major role which can act as either a bridge or barrier to infrastructural project delivery. The study recommends that for projects to be completed on time, cost and scope, project failure factors have to be put into consideration throughout the PLC with reasonably sufficient time dedicated to their analysis and acquiring sufficient knowledge of these failure, delay and project abandonment triggering factors before embarking on a choosing infrastructure project.

Keywords: Delays, Failures, Abandonments, Construction Infrastructure Project, Literature Review

1.0 Introduction

The construction industry, which is one of the oldest industries in the world, is essential for the infrastructural growth and development of any nation. According to [1], the industry serves as a forecaster of a nation's economic direction and is therefore considered a leading sector in an economy. Historically, the construction industry is linked with industrialization and urbanization process [2, 3], and is project – specific [4]. This is an indication of the construction industry significance across generations and developmental stages. Moreover, there have remained strong construction activities in developing nations reinforced by an increment in infrastructure investment as a result of the support from national and multinational financial institutes with an aim for the socio-economic development of the nation [5]. Through the various tiers of government, the government are expected to provide development for its teeming populace which includes efficient healthcare system, consistent supply of electricity, good road network, portable water supply and educational facilities [6], which are induced by the project infrastructural needs of the populace. In Africa generally, there remains significant contribution of the infrastructure development to the growth, employment and socio-economic development [7, 8], and these infrastructural development models have in recent times enters a transition period, leading to a more demand-driven and decentralized provision models from centrally-controlled public sector provision [9]. The rate at which there is an expansion in the infrastructure network is an important factor that can induce growth and development in countries that has low income [10, 11].

Despite the continued need of infrastructure projects alongside its economic contributions, project infrastructure delays, failures and abandonments are key occurrences inherent in the construction sector project delivery. They combined to present a scenario where milestones and key dates are being missed or in another case, where there is a deprivation in the contractual dates of completion [12]. These factors may be similarly characterized as an inducer of the rise in contractors overheads and labour costs, and are therefore, highly undesirable by all parties involved in construction infrastructure [13], as it is an avenue that mostly triggers fraudulent practices. In consonance, Sohail & Cavill, [14] posited that, the global construction industry loses around US\$340 billion annually due to fraudulent practices. These challenges of infrastructure project delays, failures and abandonments are however not limited to the Nigerian construction projects [15], as similar challenges are prevalent in the construction industry of other nations including UK [16], Gaza Strip [17], Kenya [18] and Ghana [19]. Owing to the project infrastructure development needs of developing nations, infrastructural projects are often embarked on within a nation's construction industry [20, 21, 22, 23, 24]. Therefore, these project infrastructure delays, failures and abandonments triggering factors have monumental consequences on the direction of the countries development and the citizen's economic performances.

Subsequently, extant literatures has focused on the assessment of these factors that has accounted for infrastructure project failures, delays and abandonments, and many of such studies are on the basis of

private sector or industry-wide perspective factors [20, 22, 25]. Others however, focused on government project failures, delays and abandonments owing to their importance in national growth and development of several developing nations with numerous stakeholders attached to these construction projects [4, 5, 8, 21, 23]. This study thus, will provides a review of these literatures within the Nigerian context and globally, in the context of developing nations on the basis of these infrastructure project failures, delays and abandonments factors with a view to providing improvement measures to curtailing these project delay, failure and abandonment causing factors.

2.0 Methodology

This study assessed critical literatures on the factors causing delays, failures and abandonments of construction infrastructure projects. Through the usage of literature review approach, relevant and related studies are reviewed by authors in order to achieve the objective of this research. [26, 27, 28], sees literature review as a way of gathering and summarizing previous studies which can serve as basis for the creation of knowledge, policy recommendation, produce ways of practice, provide proof of an impact, and if correctly carried out can potentially provide new concepts or triggers new direction of approach in a certain field. Moreover, the review of literatures can provide solution to a certain research topic that no particular study can provide an answer to by linking the viewpoints and findings of several empirical literatures. This is evidenced in several studies including that of [29, 30, 31] that employed literature review method in addressing several research objectives. This paper will therefore, present the empirical findings from the quantitative, qualitative or combined approaches of previous and related studies on the delay, failure and project abandonment inducing factors affecting infrastructure project delivery in the Nigerian context and globally, in the context of developing nations.

3.0 Discussion

3.1 Delay, failure and project abandonment factors affecting infrastructure project delivery in Nigeria

Table 1: Publications on delay, failure and project abandonment factors affecting infrastructure project delivery in Nigeria

Source	Title	Objective(s) of Study	Methodology of Study	Main Findings	Study's Limitation
Okoro [32]	Investigated state influence on access to land and project implementation of Federal Government construction projects in South-South Nigeria	To assess the state influence on access to land and project implementation of Federal Government construction projects in South-South Nigeria between 2006 and 2016	Structured Questionnaire, Simple Percentages, Least Significant Difference (LSD) test and one-way Analysis of Variance (ANOVA)	The result showed that owing to land accessibility challenges, State of the domiciled project has significant effect on project implementation and on both dependent variables	The study was restricted to some states in the South-South region
Semoniwon [33]	Explored Project Finance (PF) in the procurement of public infrastructure projects	To assess Project Finance (PF) in the procurement of public infrastructure projects to bridge the gap in Nigeria's infrastructural development.	Structure Questionnaire, Mean Item Score (MIS), Standard Deviation (SD) and Chi-Square Goodness-Fit-Test	The findings showed that PF deals perform more under some selected social and economic infrastructures	The study was limited to Lagos geographical area
Unegbu et al. [34]	Assessed the relative importance and relationships of the project management practices of construction companies in Nigeria	To investigate the relative importance and relationships of the project management practices of construction companies	Questionnaire Survey and Relative Importance Index (RII)	Result showed that respondent where of the opinion that proper usage of project management practices promotes project managements as showed by the average value of their relative importance	-
Egwim et al. [15]	Studied the most underlying factors triggering construction project delay	To explore the most underlying factors triggering construction project delay	Significance Index Measurement of Delay Parameters (SIDP), Correlation Analysis and Factor Analysis	The study revealed that project quality control, program of work/project schedule, financial difficulties of contractors, political interference, site condition and fluctuation in prices to be the top factors	Reduced number of responses used
Ezejiofor et al. [35]	Examined the effect of internal control on capital projects execution in Anambra state, Nigeria	To examined the effect of internal control on capital projects execution in Anambra state, Nigeria	Survey Research Design and Regression Analysis	Results indicated that personnel control (PSC) has positive but inconsequential consequences on the execution of capital projects in Anambra state, Nigeria	Restricted to Anambra State (South-East Nigeria).

Ikechukwu & Ozuzu [36]	Evaluated the factors influencing the abandonment of the proposed hospital projects	To evaluate the factors influencing the abandonment of the proposed hospital projects in Imo State's 27 local government areas in Nigeria	ANOVA, Student t-test, Relative Importance Index (RII) and Chi-square test	The ensuing findings indicated poor project implementation, undesirable government political practices and the lack of enablers that can ensure project continuity as the top factors.	Limited to Imo State (South-East Nigeria)
Alameri et al. [37]	Assessed the level of risk challenges confronting the construction projects in Nigeria	To explore the level of risk challenges confronting the construction projects in Nigeria	Risk matrix, Data Plot and Mean Value	Mean Value result showed that time, cost and quality are the top three challenges confronting construction projects delivery; the risk matrix indicated that all challenges are high-risk challenges	
Odimabo [38]	Analysed risk management system to guide construction projects in developing nations with reference to Nigeria	To analysed risk management system to guide construction projects in developing nations	Questionnaire Survey, Frequency Distribution and Central Tendency	The findings indicates the development of a best risk management practice system in Nigeria's construction projects with an operation guide to assist construction professionals	-
Abiodun & Nwagu [39]	Assessed comparatively rework occurrences on buildings in Akure Municipal of Ondo State, Nigeria	To promote building works being carried with maximum care and control to minimize drastically	Closed-Ended Well-Structured Questionnaire, Snowball and Purposive Sampling, frequency, percentage, Mean Item Score, Relative Importance Index (RII), Mann-Whitney U Test and Spearman's Rank Correlation Coefficient	The result of the descriptive statistics revealed plumbing; sanitary system and electrical services are the most defective.	Limited to Akure in Ondo State (South-West, Nigeria)
Alayande & Wasiu [40]	Identified and assessed the barriers to construction projects stakeholder management	To identify and assess the barriers to construction projects stakeholder management. To examine critical success factors affecting stakeholder management in construction project delivery	Qualitative Research Design, Semi-Structured Interview	Result showed that the reduced understanding of stakeholder management practice and absence of appropriate stakeholders management practices were the most typified barriers influencing stakeholder management	Restricted to Abuja metropolis
Abdulkadir et al. [41]	Explored the severity degree, mitigating measures as well as stakeholders challenges in curtailing the factors affecting construction project cost in North-eastern, Nigeria	To investigate the severity degree, mitigating measures as well as stakeholders challenges in curtailing the factors affecting construction project cost in North-East	Percentages, Severity Index, Relative Important Index (RII) and Inferential Statistics	The result indicated the top factors severely influencing the cost of construction as market condition stability, building materials fluctuation and prices of labour, and problems of funding.	Reduced number of questionnaires administered
Adindu et al. [42]	Assessed the level of construction Sustainable Construction (SC) awareness, source of SC knowledge and also proffers ways of SC applicability improvement in Nigeria	To assess the level of construction Sustainable Construction (SC) awareness. To determine the source of SC knowledge and also proffers ways of SC applicability improvement	Structured Questionnaire and Descriptive Research Survey	The result indicated all states in the six geopolitical zones fell below the value of 0.700 which is the Geopolitical Zone Mean Awareness index (GZMAi) value	-
Cross & Abbas [43]	Studied the underlying factors that triggers project failure and their influence on the Nigerian construction sector	To reveal the underlying factors that triggers project failure and their influence on the construction sector	Quantitative Research Approach, Online Questionnaire Survey and Relative Importance Index (RII) technique	The result of the ranking indicated 12 underlying factors that trigger project failure and abandonment some of which are corruption and bureaucracy, absence of appropriate project planning and poor communication	Restricted Number of Responses

Manu et al. [44]	Investigated the gap critical to the procurement capacity of state and local government agencies that are part of the public infrastructure procurement in Nigeria	To explore the gap critical to the procurement capacity of state and local government agencies that are part of the public infrastructure procurement	Questionnaire Survey and Descriptive Statistics	The result accentuates the keenness of procurement capacity weakness of organization amid public institution contained by governance structure of Nigeria.	Limited to public infrastructure procurement
Fadun & Saka [45]	Investigated construction industry risk management with reference to the critical success factors (CSFs) of Nigeria's construction projects	To explore construction industry risk management with reference to the critical success factors (CSFs) of Nigeria's construction projects	Structured Questionnaire and Exploratory Factor Analysis	The consequence of the result of this study is that it is of utmost importance for Nigeria construction project managers to establish and regulate CSFs of all project at the planning stage.	Only CSFs are considered
Oluwaseyi & Godwin [46]	Assessed the causes of abandoned projects with reference to public tertiary institutions in Nigeria	To assess the causes of abandoned projects with reference to public tertiary institutions in Nigeria. To providing empirical information that can aid in promoting successful delivery of research facilities and teaching in Osun state	Questionnaire, Mean, Factor Analysis and Kruskal-Wallis (K-W) test	payment delays, mismanagement of fund, insufficient budgetary provision, insufficient finance, and inflation and contractors bankruptcy as the top most factors inducing delay	Restricted to tertiary institutions only
Mac-Barango [47]	Examined the causes and effects of construction project abandonment in Nigeria	To examine the causes and effects of construction project abandonment in Nigeria with the research data on some abandoned projects retrieved from construction professionals across three cities	Primary and Secondary Data Sources, Mean Scores (Central Tendencies) Values	The findings indicated that planning inadequacy, project scope variation, faulty design, payment delays and incompetence as the major factors influencing project abandonment.	The considered abandoned projects were not explicitly stated
Richard et al. [48]	Examined the influence of project size and the different between base estimate and initial contract sum in change order rate prediction	To examine the influence of project size and the different between base estimate and initial contract sum in change order rate prediction	Descriptive and Influential Statistics	The outcome of the analysis posited that project size and the change between base estimate and initial contract sum can be change order rates predictors	The study period is restricted to be between 2004 and 2016
Ojo & Aroge [49]	Investigated and determined the various causes of government industrial abandonment projects (GIAPs) in Ondo State, Nigeria	To investigate and determine the various causes of government industrial abandonment projects (GIAPs)	Wide Questionnaire Survey, Frequencies, Percentages, Mean and Standard Deviation	The result indicated cost under run and site workers shortage as some of the principal causes of GIAPs owing to resource challenge, fraudulent practices, and bribery and corruption.	Restricted to Ondo State (South-West, Nigeria)

Source: Authors, (2022)

3.2 Delay, failure and project abandonment factors affecting infrastructure project delivery globally in the context of developing nations.

Table 2: Publications on delay, failure and project abandonment factors affecting infrastructure project delivery globally in the context of developing nations.

Source	Title	Objective(s) of Study	Methodology of Study	Main Findings	Study's Limitation
Fatayer et al. [50]	Investigated the reasons behind the non-fulfilment of contractual requirement in three varying project types in Palestine	To investigate the reasons behind the non-fulfilment of contractual requirement in three varying project types which are road, building and electro-mechanical projects	Qualitative and Quantitative Data, Literature and Semi-Structured Interview, Mean, Standard Deviation and Degree of Importance	The outcome showed the causes of the lack of contractors contract fulfilment in building project is awarding of the contract to the lowest bidder with a low profit margin, owing to strong competition among the contractors.	-
Solomon et al. [51]	Investigated comparatively the success factors prevalent in the Ethiopian private	To investigate comparatively the success factors prevalent in the Ethiopian private and	Structured Questionnaire Matrix and Delphi-Analytic Hierarchy Process (AHP) method	Result showed the top three ranked success factors that are critical in the private sectors	-

	and public construction sector	public construction sector		comprises of unambiguous project goals, contractors financial capacity and consulting firms competencies.	
Khudhaire & Naji, [52]	Explored the causes of the abandoned construction project in Iraq	To explore the causes of the abandoned construction project	Questionnaire Survey and Relative Importance Index (RII)	The result showed the highest causes of project abandoned from the highest are time, finance and resources with a corresponding overall RII of 78.0, 76.3 and 75.8.	The methodology was limited to RII
Banerjee et al. [53]	Developed a risk prediction system based on a cross analytical-machine learning model for construction megaprojects	To develop a risk prediction system based on a cross analytical-machine learning model for construction megaprojects	. Questionnaire Synthetic minority over-sampling technique (SMOTE) and the Wilcoxon rank-sum test, K-means clustering, a genetic-algorithm-based K-means clustering algorithm (GA-K-means)	The result from the model proposed established variety of sub-risk factors and high-risk factors, which can cumulatively impact performance overall	-
Albtoush, et al. [54]	Established the most substantial causes of cost overrun in construction projects in Jordan	To establish the most substantial causes of cost overrun in construction projects	Questionnaire Survey and Multivariate Statistics	The study findings showed the existence of four fundamental reasons behind cost overrun which are financial difficulties, materials issues, design issues and additional works.	Only qualitative data was employed for the study
Nguyen et al. [55]	Identified critical factors (CFs) influencing Construction Labour Productivity (CLP) by comparing the perception between project managers and contractors	To identify critical factors (CFs) influencing Construction Labour Productivity (CLP) by comparing the perception between project managers and contractors	Structured Questionnaire Survey, Mean, Standard Deviation, and Inferential Statistics of Relative Important Index (RII)	The ensued result posited the existence of a wide range of difference between contractors and project managers view of the highest factors affecting construction labour productivity	Restricted to the perception of Project Managers and Contractors
Fariala & Awolusi [56]	Explored the construction projects key success factors in the Democratic Republic of Congo (DRC)	To explore the construction projects key success factors in the Democratic Republic of Congo (DRC)	Quantitative Methods	The finding stemming from the study indicates that DRC construction project success could be induced via effective and efficient risk management	-
Damoah et al. [57]	Assessed the reasons behind government construction project abandonment in Ghana	To assess the reasons behind government construction project abandonment	Sequential Data Collection Technique, Detailed Semi-Structured Interviews, Questionnaire Surveys, Factor Analysis and Structural Equation Modelling	The study revealed political leadership, culture, external forces, resources availability and funding, and institutional / administrative bottlenecks as the top factors	Limited to Ghana government construction project implementation
Yap et al. [58]	Revisited the construction critical delay factors in Malaysia through project analysis	To assess the construction critical delay factors in Malaysia through project analysis	Questionnaire Survey, Relative Importance Index (RII) and Spearman's Rank Correlation Tests	The top three factors indicated by the result are absence of proper planning and scheduling, numerous clients change order and absences of competencies in site supervision	-
Thani [59]	Examined the reasons behind Botswana public project failure from the view point of the contractor	To examine the reasons behind Botswana public project failure from the view point of the contractor	Questionnaire Survey and Descriptive Statistics	Result indicated the top project failure factors to be corruption, project funds late payment, delays in procurement, and improper risk management, poor work ethics.	Limited Number of Respondents
Taofeeq et al. [60]	Investigated the risk attitude influencing the contractors from	To investigate the risk attitude influencing the contractors from	Questionnaire Survey and Descriptive Statistics	The results from the study indicated that changes are familiar	-

	the perspective of the Malaysian Construction Industry	the perspective of the Malaysian Construction Industry		and frequently occurs at any stage during the project	
Uneb & Raza [61]	Assessed organizational structures effects and construction types on view of project failure factors in Pakistan	To assess organizational structures effects and construction types on view of project failure factors	Questionnaire Survey and Descriptive Statistics	The ensued result indicated that project planning and management factors are highly rated by construction experts overall.	-
Nyuonguo & Sundjo [62]	Conducted an empirical investigation into construction project failure inducers in the Cameroon Baptist Convention Health Services (CBCHS) technical department	To construction project failure inducers in the Cameroon Baptist Convention Health Services (CBCHS) technical department	Questionnaires, Descriptive Statistics and Probit Regression	Amid several ensuing result from the study, it was discovered that non-resolution among participant neither influenced the expected completion time nor the project execution cost	Limited to Cameroon Baptist Convention Health Services (CBCHS) technical department
Subhav et al. [63]	Assessed the different traits for delay in construction projects using Indian residential building projects	To establish the different traits for delay in construction projects using Indian residential building projects as a point of beginning	Questionnaire Survey and Relative Importance Index (RII)	Analysis result showed that on-site material shortages, unexpected site condition, weather condition challenge, rework, insufficient modern equipment as some of the major delay causes	Restricted to Indian residential building projects
Shakil et al. [64]	Assessed the reality check against skilled worker parameters and parameters failure effect for Bangladesh construction industry	To assess the reality check against skilled worker parameters and parameters failure effect for construction industry	Questionnaire Survey and Descriptive Statistics	Result showed the percentage of workers having complete understanding and working regulation of safety in construction to be 19.35%, materials as 6.45%, equipment and tools as 9.68% and more.	Limited to a geographical area
Damoah & Akwei [65]	Examined the extent of failure within government projects in Ghana by adopting multiple failure criteria	To examine the extent of failure within government projects in Ghana by adopting multiple failure criteria	Comprehensive Semi-Structured Interview and Questionnaire, Relative Importance Index (RII)	The results showed that Ghanaian government projects fail on the entire six failure criteria, but the degree of failure vary from one criterion to the other.	Limited to interview questions
Shahhosseini et al. [66]	Investigated construction project failure root causes in Iran	To investigate construction project failure root causes	Fault Tree Analysis (FTA) and Linguistic Weighted Average (LWA)	The ensued outcome showed that the majority of project complications arise from financial inadequacies and bidding process weaknesses.	Limited to project failure factors

Source: Authors, (2022)

3.3 Discussion of Findings

3.3.1 Discussion of Findings in the Nigerian Context

The continued persistence of delays, failures and abandonments factors experienced in the construction infrastructure project in Nigeria are as a result of the inadequacies of the project managers to have and apply requisite project management skills while handling construction projects [34]. Subsequently, [41] posited the top challenges to triggering project infrastructure development to be government attitude towards market price stability and insufficient awareness on the extent of construction cost increment. These as a result, affect the performances of the construction sector in terms of reduced infrastructure delivery and then, poor economic performances. Other studies posited delays, failures and abandonments factors to be induced by land accessibility challenges and location of project domiciliation [32]; level of project financing exhibited in the project [33]; project quality control, financial difficulties of contractors, program of work/project schedule, political interference, fluctuation in prices and the condition of site [13]; resources wastage, decreased employment opportunities, construction activity inconsistencies and reduced government revenue [47]; lack of development of a best risk management practice system in Nigeria's construction projects with an operation guide to assist construction professionals to productively implement risk management on their construction projects [38]. Subsequently, according to [36], the factors triggering project abandonments includes poor project implementation, undesirable government political practices and the lack of enablers that can ensure project continuity in cases where projects are not being completed by an incumbent government. These means that there is need for proper project implementation through the application of requisite project management tools with desirable government policies as well as the

need for continuity in government projects. For instance, the current administration continued the transportation infrastructural project started by the previous democratic government and has resulted into easier and faster delivery of the project on the basis of the continuity experienced in government in that area. This has therefore, facilitated the easy movement of people and goods from one location to the other within the country [67], as improvements were recorded in that area of project delivery.

3.3.2 Discussion of Findings in the globally in the Context of developing nations

The persistent delays, failures and abandonments factors affecting infrastructural project delivery includes insufficient resources, improper project management, budget overrun, improper planning and time overruns, insufficient know-how, poor risk management and project scope, disputes and poor communication according to [59]. In consonance, [51], posited these factors to be ambiguous project goals, contractor's financial capacity and consulting firm's competencies. These shows that ambiguity in scopes of the project causes confusion between the contractor and the client, insufficient financial level of the contractor induces project's inability to reach milestones, and consulting firms incompetence triggers ambiguity in the project scope. Other studies posited these delays, failures and abandonments factors to be associated with time, finance and resources constraint [52]; financial inadequacies and bidding process weaknesses [66]; external forces, cultural and political leadership are primary causes while the secondary reasons are administrative/institutional logjams and resources (including funding) causes [57]; wide range of difference between contractors and project managers view [55]; improper risk management lead to disruption of work sequence and impacting productivity, and subsequently, schedule delays and cost overruns [60]. Interestingly, the foregoing show that quite a large number of infrastructural projects are affected by these factors in the past and are still largely prevalent throughout the PLC with renewed challenges of these factors playing a major role which can act as either a bridge or barrier to infrastructural project delivery.

4.0 Conclusions and Recommendation

The review of the literature has provided concrete evidence on the project failure factors constituting challenges to construction project in Nigeria and globally in the context of developing nations. This study concludes that appropriate management of these project failure, delay and abandonment causing factors such as ineffective project planning, political pressure, design alteration, scope complexity and insufficient understanding of project management as well as financial aptitude and market estimates are some of the improvement measures to be made use of, as they are integral to construction infrastructure project delivery. This is reinforced by the findings that indicated that, quite a large number of infrastructural projects are affected by these factors in the past and are still largely prevalent throughout the PLC, and further posited that in every project, these factors play a major role which can act as either a bridge or barrier to infrastructural project delivery. The study recommends that, for projects to be completed on time, cost and scope, project failure factors have to be put into consideration throughout the PLC with reasonably sufficient time dedicated to their analysis and acquiring sufficient knowledge of these failure, delay and project abandonment triggering factors before embarking on a choosing infrastructure project.

Acknowledgement

We express our appreciation to the Faculty of Engineering, Universitas Sarjanawiyata Tamansiswa, the organizers of the International Conference on Sustainable Engineering and Technology (IC-SET) 2022, "Engineering and Technology Innovation for Sustainability" for the opportunity to present this manuscript.

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