



Factors Influencing Overruns of Construction Projects in Northern Nigeria

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ABSTRACT

The timely completion of a project within the set budget is critical to the success of any construction project. Method of execution, labor management, equipment, schedule, and cost are only a few of the aspects that influence project management, and these factors are the cause of cost and time overruns all over the world. Using a completed project, the goal of this study is to identify and prioritize the key causes of time and expense overruns in the construction industry in northern Nigeria. The kano state ground anchoring project, a contracting firm, a consulting firm, and government parastatals all provided data. To understand the reasons of cost and time overruns, the data is studied and compared to the estimated and actual budget schedules. The most major cost reasons include increased material costs, erroneous materials estimation, and underestimating project expenses, among others, while the most significant time factors are unanticipated site conditions, increased project scope, lack of timely progress payment, and inadequate planning. It becomes clear that paying close attention to the elements that contribute to construction overruns will help to mitigate their negative effects on project performance and efficiency. Cost estimators should improve their methods of cost determination, designers should make full designs available at every stage of the construction process, and contractors should conduct adequate site visits for a better understanding of site conditions before pricing and cost forecasting, according to the recommendations.

Keywords: influencing factors, overruns, construction cost, construction time, project performance, construction process, cost forecasting, northern Nigeria

INTRODUCTION

The construction sector contributes to the advancement of any region's socioeconomic and infrastructure development. Construction sectors and their potential for quicker growth are important indicators of development in emerging countries. Because of the rising uncertainty in technology, budgets, and development procedures around the world, the construction business is dynamic. Overruns in time and expense in the building sector or venture have become a severe issue around the world, including in India, in recent decades. Due to the growing need for infrastructure around the world, particularly in developing countries, project managers must complete assigned projects on schedule and within budget. A great number of construction projects in India have been delayed due to many reasons and concerns that have been studied by various researches, however these reasons vary from place to place in India due to the country's terrain. According to the owners, contractors, and consultants, schedule delays and cost overruns are the most common and serious problems in the construction industry. A survey of water drilling projects in Ghana found that thirty-three out of forty-seven projects completed between 1970 and 1999 were delayed, and over 38 projects were facing cost overruns. The most significant delay issues in Ghana were an increase in material rates, material arrangements, and client financial difficulties. According to a review of the literature, construction projects in many countries continue to face schedule overruns that require immediate attention. In Indonesia, 31 high-rise buildings are responsible for time overruns, with the most significant factors being design changes, poor labor efficiency, inadequate planning, and a lack of resources. Project management consultants believe that contractors are responsible for time overruns in the construction industry. Successful project management is defined as completing project deliverables and objectives within the time and budget constraints. Basically, the variables that cause time and expense overruns range from country to country and are dependent on economic, political, and geological considerations. In most cases, there is no suitable mechanism to verify the ability level of the workforce before deploying them to work, which results in poor production. Time and cost overruns are frequently associated with human resources, which have a significant impact on cost overruns. Successful project completion usually necessitates specialized contract work and the adaptation of a model to the actual project environment, a process that closely specifies potential studies on contractor selection and funding. The project's major achievement should be viewed from the many potential of individuals by a client, contract department, and general public, by which these all common variables of criteria such as time and cost performance are all considered. Grants for construction operations are used to govern the economy in several countries. Reduce the changes in the work scopes, as this reduces the maximum impact on cost and time overruns, as the construction industry continues to grow in size. An example is the northern bypass Kampala, which was planned to take two and a half years to construct but instead took more than five years and cost more than 100 percent more than before. The growth of the construction industry in developing countries would help to anchor the increase of the nation's GDP and provide many job opportunities for the people. Variations in material costs, the lack of a competent consultant, a lack of quality equipment, and equipment availability are all factors that contribute to cost and time overruns in highway construction in India. Overruns in construction costs are having a visible impact on the sector and major players. These can gain a bad

reputation and be unable to secure project funding or security. Changes and increases in material rates are becoming a key role in these overruns, and material rates and labor costing prices should be updated on a regular basis. In India, the construction industry contributed an estimated 308 billion dollars to the country's GDP in 2011-2012. (a share around of 19 percent). There were about 35 million individuals employed in this sector, and there were 500 construction enterprises in the country. These time and expense overruns must be prioritized, with immediate consequences for actions. Changes in material rates, financial instability, currency exchange, political anxieties, and strong competitiveness are the top five causes that cause time and expense overruns in India. According to government data, 60 percent of projects are overwhelmed by time and expense overruns, and McKinsey anticipates a loss of US\$200 billion or 10% of GDP in fiscal year 2017. The current study uses data from ground anchoring projects based on a Shan-E-Awadh project in Lucknow to examine, identify, and prioritize major causes of schedule delays and cost overruns in the construction industry. There are many factors that can cause schedule delays and cost overruns in ground anchoring projects. These include material management issues as well as physical, social, environmental, and financial problems that might lead to delays and cost overruns. The goals of this paper are to: a) find the factors and reasons causing schedule delays and cost overruns in construction projects, such as the Shan-E-Awadh project in Lucknow; and b) identify the causes of schedule delays and cost overruns in construction projects, such as the Shan-E-Awadh project in Lucknow. b) Instructing the recommendations to reduce or eliminate cost overruns and schedule delays, with the goal of reducing similar effects on future building projects.

In Nigeria, the building industry is critical for job creation and economic growth (Ogunsemi and Jagboro, 2006). According to Kaize (1987), construction costs account for over half of all government spending in Nigeria. The primary factors for determining the total performance of building projects have been defined as time, cost, quality, and satisfaction (Dissanayaka and Kumaraswamy, 1999). A project is usually considered successful if it is completed on time, within budget, and to the level of quality standard stipulated by the client at the start of the project, according to Chan and Kumaraswamy (1996). Balogun (2005) stated that the ultimate goal of any construction project is to be completed in the shortest amount of time, at the lowest feasible cost, and with the highest possible quality, even though this goal appears unattainable for many projects. He also stated that the Nigerian construction industry is beset by numerous issues, including late completion and cost overruns. As a result, increasing construction efficiency through cost effectiveness and punctuality would undoubtedly help Nigeria save money (Kaming et al., 1997).

LITERATURE REVIEW

Overruns in the building sector are an international problem, albeit the situation differs by country. Many factors depending on the general economy and construction settings in those countries influence the rate of variance. Overruns in construction projects can take several forms, including cost, time, and other factors. This study looked into the elements that influence cost and time overruns in Nigerian building projects, which are detailed below:

Cost Overruns

It is critical to understand the core reasons of cost overruns in order to address and manage them. While individual events like extreme weather can cause delays or damage, which can lead to cost overruns, they are frequently the result of more complicated project management difficulties that are difficult to unravel. The most significant cost overruns usually emerge as a result of a change in requirements. If the client, for example, requires a space that is 20% larger than first estimated, the cost is likely to rise by at least 20%. As a result, it's critical to make sure the project brief is thorough and that all project stakeholders recognize and agree on the particular scope of work and performance expectations. Pre-construction estimates and meticulous project planning are then essential for assuring accuracy and confidence in project costings, especially if the project is complicated and prone to change. In some circumstances, design and construction concerns can be addressed by employing project-wide project management, cost control software, or building information modeling (BIM) to ensure that all stakeholders are working with the same up-to-date design information and can make real-time adjustments. Change orders could potentially be a factor in cost overruns. A change order is work that is added to or removed from a contract's original scope of work, changing the contract's original amount and/or completion date.

Time Overruns

Morris (1990), Chan and Kumaraswamy (1996), Proverbs, Holts, and Olomolaiye (1998), Izam and Kolawole (1998), Ojo and Dada (2005), Kaming et al (2006), Otunola (2007), and Otunola (2007) are some of the studies on time overrun or delay (2008). Poor project design and implementation, bureaucratic decision-making, insufficient project funding, lack of coordination, inclement weather, lack of resources, changes in scope of work, force majeure, and on-site/off-site disputes have all been identified as factors contributing to time overruns by Morris (1990). Project environment, participant roles and duties, managerial arrangements, human elements, contract forms, planning and control system are among the factors studied by Chan and Kumaraswamy (1996). Numbers of supervising employees and allowance for daily relaxation/rest intervals were identified as factors influencing time overruns by Proverbs, Holts, and Olomolaiye (1998). Izam and Kolawole recognized insufficient time escalation strategy, satisfied customer and consultant, sufficient tender return date, qualified manpower, and acceptable database in Nigeria (1998). In Nigeria, Ojo and Dada (2005) recognized the following elements as impacting time overruns: availability of resources, nature and scope of work, topography and climatic circumstances, inadequate weather, location and access to site, civil commotion or strike, and so on. Design changes, low labor productivity, and poor planning were among the factors found by Kaming et al (2006). Otunola (2007) divided delays into three categories: those caused by contractors, employers, and parties with outside controls. Earthquake, government legislation, tenement requirement, town and regional planning, lack of resources, design changes, changes in scope and specification, unpredictable weather conditions, errors and omissions in design, poor site/soil condition, and subcontractors are all factors that contribute to time overruns, according to Otunola (2008).

METHODOLOGY

This research is based on a review of data from a finished project. As a result, the construction project must be closely monitored and analyzed. Tendering department, contractor, account department, and interviewing officials of construction businesses (tech9 engineering solutions & Nagarjuna Construction Company) collected data for this study, which was largely carried out as follows: 1. Determine the project for the time and cost overrun case study. 2. Thorough examination of all accessible plans, schedules, estimates, and work methods, as well as the collection of all pertinent project data. 3. Using the literature research, determine the many elements that cause schedule delays and cost overruns in construction projects. 4. Created an 81-factor questionnaire based on past research and literature reviews. 5. A questionnaire was sent to 40 people who worked on the Shan-E-Awadh soil anchoring project (design department, senior engineers, contractors, marketing department, assistant engineers, accounts, quality department, quantity department, project in charge). Scaling was used to order the questions (1=very low, 2=low, 3=Medium, 4=high, 5=very high). 6. Analyze the survey data and identify the key factors that contribute to schedule delays and expense overruns. 7. Identified all flaws, reached final conclusions, and proposed suitable remedial options for future projects

RESULTS AND DISCUSSIONS OF FINDINGS

Tables 1-2: show the distribution of questionnaire in the study area and among organizations in the study area. The study area was kano, kaduna and zamfara in North-western Nigeria. **The Table 1:** shows that 16(46%), 11(31%) and 8(23%) were distributed in Kano, kaduna and zamfarastates respectively. This is considered adequate because kano and kaduna are oldest states in Northern Nigeria with ancients' cities as the state capitals where there is high concentration of construction activities and construction professionals in the country. **Table 2:** also indicates that 10(29%), 13(37%) and 12(23%) were distributed to contracting firms, consulting firms and government establishments/parastatals. This is adequate because it gives a due representation of both the public and private sector in the assessment process.

Table 1: Distribution of Questionnaire in the study area

State	Number of Respondent	Percentage (%)
kano	16	46
kaduna	11	31
zamfara	8	23
Total	35	100

Table 2: Distribution of Questionnaire by organizations

S/N	Number of Respondent	Percentage (%)
Contracting	10	29
Consulting	13	37
Government parastatals	12	34
Total	35	100

The demographic information of the respondents who are professionals in the construction industry in Northern Nigeria is presented in **Tables 3-6** below. Their job title, highest academic level, professional qualification, and years of work experience are among the socioeconomic characteristics evaluated. Table 3 shows that ten percent (29 percent) were architects, thirteen percent (37 percent) were quantity surveyors, nine percent (26 percent) were engineers, and seven percent (20 percent) were builders. Table 4 illustrates the respondents' highest academic qualifications: none of them have a PhD, 5 (14 percent) have a Master's degree, 19 (54 percent) have a Bachelor's degree, and 11 (32 percent) have a Higher National Diploma. The respondents are thought to have acceptable intellectual qualifications, making the information gleaned from their responses credible.

Table 5 assesses the respondents' level of professionalism: the results show that 4 (11%), 9 (26%), 7 (20%), and 5 (14%), respectively, were members of the Nigerian Institute of Architects, Nigerian Institute of Quantity Surveyors, Nigerian Society of Engineers, and Nigerian Institute of Building. 10 (2%) said they were not yet qualified members of their professional organizations. This indicates that more than 70% of the responders are members of various professional organizations. Those who aren't qualified are undergoing training or waiting to be inducted into the numerous professional institutes. Their years of work experience is another key aspect that could influence the credibility of their responses. **Table 6** shows that 9(26%), 13(37%), 5(14%), 6(17%), and 2(6%) had 0-5yrs, 6-10yrs, 11-15yrs, 16-20yrs, 16-20yrs, and Above 20yrs, respectively. The respondents' average year of experience was judged to be ten years. According to the calculated percentage distribution and mean, the respondents had sufficient years of work experience.

Table 3: Designation of Respondents

S/N	Number of Respondent	Percentage (%)
Architect	6	17
Quantity Surveyor	13	37
Engineer	9	26
Builder	7	20
Total	35	100

Table 4: Highest Academic Qualifications of Respondents

Qualification	Number of Respondent	Percentage (%)
PhD	-	-
M.Sc.	5	14
B.Sc.	19	54
HND	11	32
Total	35	100

Table 5: Professional Qualifications of Respondents

S/N	Number of Respondent	Percentage (%)
MNIA	4	11
MNIQS	9	26
MNSE	7	20
MNIOB	5	14
Non-Qualified	10	29
Total	35	100

Table 6: Respondents' Work Experience

S/N	Number of Respondent (F)	Percentage (%)	Mid-Point (X)	FX
0-5yrs	9	26	2.5	22.5
6-10yrs	13	37	8	104
11-15yrs	5	14	13	65
16-20yrs	6	17	18	108
Above 20yrs	2	6	23	46
Total	35	345.5	Total	35

Mean = 10

Table 7: The questionnaire was filled up by the employees who worked on the soil anchoring project in Kano State. Elements were sorted based on responses in order to discover the most critical factors that influence time and cost overruns in soil anchoring. The study reveals that there are numerous critical aspects that influence the causes of kano's project's schedule delays and cost overruns. Table 7 shows the five most important issues that caused delays and cost overruns during the study. Poor material management (PMM), site conditions (SC), unskilled labor/labour strikes (USL), contractor financial issues (CFD), and machine and equipment challenges are among these factors (M&ED).

Table 7: main factors of causing time and cost overruns

Factors	1	2	3	4	5	Total points (1 or 2 or 3 4or5)*no of points	Risk rating level
1. Poor materials management	1	3	4	6	25	$(1*1)+(2*3)+(3*4)+(4*6)+(5*25)=168$	$168/40=4.225$
2. Site conditions	2	1	2	15	18	$(1*2)+(2*1)+(3*2)+(4*15)+(5*18)=154$	$160/40=4.00$
3. Un skilled labors/labors strikes	3	2	5	9	19	$(1*3)+(2*2)+(3*5)+(4*9)+(5*19)=153$	$153/40=3.825$
4. Contatorfinancial difficulties	2	6	5	7	18	$(1*2)+(2*6)+(3*5)+(4*7)+(5*18)=147$	$147/40=3.675$
5. Machine andequipment difficulties	3	4	7	9	15	$(1*3)+(2*4)+(3*7)+(4*9)+(5*15)=143$	$143/40=3.575$

CONCLUSION AND RECOMMENDATIONS

Overruns in construction projects are a major source of anxiety for customers, professionals, and other industry stakeholders. Cost overruns in pre-construction construction projects in Northern Nigeria are frequently caused by poor estimating procedures and late or incomplete project information preparation by industry professionals. Cost overruns during the construction stage were linked to factors such as inflation, site difficulties, and the tastes and requirements of the clientele. In general, cost overruns in construction projects were linked to a lack of project scope definition, inadequate planning, site features, and a lack of risk assessment. The overall examination of all components also revealed that inflationary increases in material

costs, erroneous materials estimation, underestimating project costs, and increasing project scope, among other things, are the most significant cost overrun drivers. Furthermore, bad design, poor cost estimating, and insufficient project information are all issues that influence time overruns at the pre-contract stage. Differential site conditions, changes in scope, and a bad payment structure at the construction stage were also linked to time overruns at the post-contract stage. In general, variables contributing to time overruns were linked to the project's nature and information. Unexpected site conditions, increased project scope, lack of timely progress payment, and inadequate planning are the most major causes impacting time overruns, according to the overall ranking. Poor project design and implementation, underestimating project expenses, insufficient project finance, adverse weather, and a strained client-contractor relationship are among the others. After identifying the factors that contribute to construction project cost and time overruns, it's clear that paying attention to them during the design and construction stages will help to mitigate their negative effects on project performance, effectiveness, and efficiency.

The article suggests that

- All professionals in control of building expenses should work to improve their cost estimation, forecasting, and management approaches. They should also be informed about government policy, which has an impact on construction prices.
- During the design and construction stages of any project, designers should have all project information ready.
- Contractors should also make sure that an adequate site visit and evaluation is conducted prior to commencing on construction project pricing, and that all relevant cost data is delivered to the estimator for cost efficiency and adequacy. Constructors should also be aware of the long-term impact of site conditions on total construction costs and schedules. This would invariably lower the amount of cost and time overruns, as well as their negative effects on the delivery of building projects in Nigeria.

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