

Stakeholders' Perception of the Causes and Effects of Construction Delays on Project Delivery

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ABSTRACT: *The growing rate of delays is adversely affecting the timely delivery of construction projects. This study therefore assesses construction stakeholders' perception of the causes of delays and its effects on project delivery in a bid to proffer solution in minimizing the occurrences of delays. Questionnaire was used to elicit responses from construction stakeholders; a total of thirty three causes of delays, seventeen resultant effects of delays and fifteen methods of minimizing construction delays were identified for the study based on literature reviews. The results suggest that client's cash flow related problems are the main causes of delays while time and cost overruns are the major identifiable effects of delays in construction projects. However, adequate project planning and budgeting were suggested as possible ways of minimizing the occurrences of delays.*

Keywords: *Cost; Delay; Project delivery; Stakeholders; Time*

I. INTRODUCTION

Delay is a pervasive phenomenon in construction project delivery. It is branded as the most common, costly and risky problem encountered in construction project with a debilitating effect on the parties to a contract [1]. It creates adversarial relationships, distrust, litigation, cash-flow problems, project abandonment and general feeling of apprehension towards each other [2]; [3]. Delays frequently occur in all phases of construction projects and have been seen as inevitable [4]; [5] which consequently results in cost and time overruns [6]. It is seen as the most prolific factor affecting project performance [7].

The demand of construction clients for the timely delivery of construction projects and the susceptibility of projects to delays and cost overruns has attracted the attention of researchers all over the world, most of who tried to identify the immediate as well as the root causes of project delay. However, despite the various study and investigation into the causes of delays, it has continued to be a deadly monster which plagues the construction industry.

The objective of this paper is therefore to evaluate construction stakeholders' perception of the major factors that causes delay in construction projects, evaluate the effects of delays on construction project delivery and to devise a method by which these effects on delays on construction project delivery could be minimized in stakeholder's perception. This is envisioned to help the stakeholders: construction clients, contractors and consultants to understand the dynamics of delays associated with construction projects.

II. LITERATURE REVIEW

A. Types of Delay

Delay in projects is almost inevitable. Some delay will take place at a particular period in the completion of an activity and some other ones may be capable of leeway in when they have their effects. According to Scott [8] he identified three major types of delay namely: employer's responsible delay; contractor's responsible delay and "neither" party responsible delay. He described employer's responsible delay as those that results into variation and failure to provide site information. Ezeokonkwo[9] further elaborated that the delays emanated from the Employer are found in the areas of extension to time and escalation of costs due to inflation, delay in the payment of interim certificates; inability of the client or his representatives in taking quick decision, late handing over of site, delay in the supply of materials and inadequate planning.

Contractor's responsible delays are caused by inability of the contractor to proceed with the project diligently and efficiently as a result of inadequate labour/ plant provisions and insolvency of the contractor. "Neither" party responsible delay (Extraneous conditions) exist in situations that are beyond the capacity of either the contractor or the client. Such extraneous circumstances are resultants from strikes, riot, exceptional adverse weather, force majeure and acts of God, loss and damage due to fire and storm, Inability of the contractor to reason beyond his control and which he could not reasonably have foreseen at the date of the contract to secure such resources and delays caused by nominated subcontractors or suppliers which the contractor has taken all possible steps to avoid or reduce [9].

Ahmed et al.[2] is of the opinion that delay could be

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non-excusable; excusable (with or without compensation) and concurrent delays. He further explained that non-excusable delays are either caused by the contractor, sub-contractor or other party but are within the control of the contractor. These non- excusable delays are as a result of equipment breakdown; inadequate scheduling or mismanagement; underestimation of productivity; construction mistakes; improper project planning; poor site management and supervision; unreliable subcontractors or suppliers and general staffing problems. Consequently, this type of delay presents no entitlement to a time extension or delay damages for the contractor if the delay can be proved to have affected the whole project but thus entitled the client to claim for a liquidated damages. A typical example is when the contractor fails to provide sufficient manpower to complete his task on time.

Excusable delays on the other hand are caused by unforeseen factors beyond the contractor or any other party and are not attributed to their negligence or faults. It is however within the terms of contract that when

excusable delays occur, both parties will have to share the risks involved. The contractor will not receive compensation for the cost of delays, but will be entitled to an additional time to complete his work and is relieved from any contractually imposed liquidated damages for the period of delays.

This type of delay can also have an impact on non-critical activities which need a more detailed analysis to determine whether an extension of time is warranted, or if the reduction of float time can be justified. Excusable delays can therefore be further classified into excusable with compensation and excusable without compensation.

B. Causes of Delay

Delays can be minimized only when their causes are identified. Knowing the cause of any particular delay in a construction project would help avoiding the same.

Table I shows the causes of delays as identified by previous researchers:

TABLE I
MAJOR CAUSES OF DELAYS

| | Researcher | Country | Major causes of delay |
|---|------------------------------------|--------------|---|
| 1 | Okpala and Aniekwu [10] | Nigeria | 1Failure to pay for completed works 2Poor contract management 3Shortages of materials |
| 2 | Mansfield, Ugwu and Doran [11] | Nigeria | 1Fluctuations in costs 2Improper financial and payment arrangements 3Inaccurate cost estimates 4Poor contract management 5Shortages of materials |
| 3 | Semple, Hartman and Jeromeas [12] | Canada | 1Increases in the scope of work 2Inclement weather 3Restricted access |
| 4 | Assaf, Al-Khalim and Al-Hazmi [13] | Saudi-Arabia | 1Changes in design / design errors 2Delay in payment to contractors 3Poor workmanship 4Shortages of labour supply 5Slow preparation and approval of shop drawing |
| 5 | Chan and Kumaraswamy [14] | Hong Kong | 1Client- initiated variation 2Poor site management and supervision 3Slow decision making by project team 4Unforeseen site conditions |
| 6 | Ogunlana and Promkuntong [15] | Thailand | 1Changes in design / design errors 2Liaisons problems among the contracting parties 3Shortages of materials |
| 7 | Odeyinka and Yusif [16] | Nigeria | 1Variation in orders. 2Slow decision making. 3Financial/Cash flow difficulties 4Resources management problems 5Planning and Scheduling problems 6Inadequate site inspection 7Inclement weather and acts of nature 8Labour disputes and strikes |
| | Mezhel and Tawil [17] | Lebanon | 1Material shortages and changes in type and specification during construction 2Skilled and Unskilled labour shortages and Poor productivity. 3Shortages of equipment, Unskilled operators, slow maintenance and old equipment. 4Cash flow during construction, Delay in contractors' progress payment by owners, contractor financing problems and varying material costs. 5Design changes by owners, design errors by consultants, geographical problems and unexpected site conditions 6Permits from municipals, permits for foreign expatriates, building codes, bureaucracy in government agencies and Urban planning permits. 7Shop drawings, preparation of network scheduling, lack of personnel training and management support, poor judgment in estimating time and resources and poor initial site planning. |

| | | | |
|----|------------------------|-----------|--|
| 9 | Al-Momani [18] | Jordan | 1Change orders/ design 2Inclement weather 3Late delivery 4Poor design 5Unforeseen site conditions |
| 10 | Lo, Fung and Tung [19] | Hong Kong | 1Exceptionally low bid 2Inadequate resources due to contractor/lack of capital 3Inexperienced contractors 4Poor site management and supervision by consultants 5Unforeseen ground conditions 6Works in conflict with existing utilities |

C. Effects of Delay

Construction delays occur either as a liability on part of the client and his team, liability on part of the contractor and his team, nature i.e. causes of force majeure and social political issues through the changes bye-laws, statues etc. The effects of these delays is always debilitating on construction project performance. Studies conducted on the effect of delay on project delivery have revealed that delays are associated with time and cost overruns as well as litigation and project abandonment. Haseeb et al.[20] identified dispute, lawsuit, total desertion, litigation and project abandonment as the effects of delays. Aibinu&Jagboro [21] identified time overrun, cost overrun, dispute, arbitration, total abandonment and litigation as the resulting effects of delays.

Survey conducted by Kaming et al.[22] studied influencing factors on 31 high-rise projects in Indonesia and found out that cost overruns occur more frequently and are more severe problem than time overruns. They pointed out that the major factors influencing cost overrun are material cost increase due to inflation, inaccurate material estimation and degree of complexities.

Li, Love and Dawe[23] argue that when delay occurs there are three possible situations that a project manager may be confronted with additional costs, a decline in quality and rework. Yet, a project manager is often faced with the following options: either prescribes overtime work and/or injects additional resources, in order to meet the project's schedule. While injecting additional resources can significantly increase project costs, prolonged overtime work may cause declines in productivity and performance, which may also generate rework.

III. METHODOLOGY

A. Research Design

This survey was carried out base on the review of relevant literatures and questionnaire surveys. Data used for the survey were primary and secondary. The primary data are the responses of the three main classifications of construction stakeholders of clients, consultants and contractors. Information regarding causes and effects of delays were extracted from the study of [11]; [13]; [16]; [19]; [20] and domesticated to the study population.

Data for this research were primarily gathered through a structured questionnaire. The questionnaire was designed with three major parts. The first part seeks for

the general information about the respondents. The second part obtains the information on factors that contribute to the causes of delay in construction projects while in the final part, respondents were asked to rank the individual effect of delay in construction project based on frequency of occurrence according to their own judgment and working experience as clients' contractors or consultants.

B. Population and Sample

The population of this research was drawn from the practitioners of the construction industry in Lagos state, Nigeria. Lagos being the commercial nerve centre. High concentration of construction works is prevalent in this area. Judgmental sampling technique was adopted in chosen respondents; construction clients, consultants and contractors were identified to provide their perceptions and opinions on the causes and effects of delays on project delivery based on their experience.

C. Characteristics of Respondents

Table II presents the characteristics of respondents with respect to their organisation types. From the table, 16% of the respondents are professionals that work in clients' organisation, while 39% and 45% represent respondents working in contracting and consulting organizations respectively.

TABLE II
CHARACTERISTICS OF RESPONDENTS

| Type of Organisation | No. | Percent |
|--------------------------|-----|---------|
| Client Organisation | 6 | 16 |
| Contracting Organisation | 15 | 39 |
| Consulting Organisation | 17 | 45 |
| Total | 30 | 100 |

TABLE III
MEAN SCORE (MS) AND RANKS (R) OF CAUSES OF DELAY ON PROJECT DELIVERY

| Hypothesized causes of delay | Clients | | Contractors | | Consultants | | Average | | Sig. |
|---|---------|------------------|-------------|------------------|-------------|------------------|---------|------------------|------|
| | MS | Rank | MS | Rank | MS | Rank | MS | Rank | |
| Financial / Cash flow difficulties | 4.33 | 1 st | 4.13 | 1 st | 4.24 | 2 nd | 4.21 | 1 st | .881 |
| Financial difficulties faced by contractors and public agencies | 4.17 | 2 nd | 4.13 | 1 st | 4.29 | 1 st | 4.21 | 1 st | .810 |
| Frequent change order/ design | 4.00 | 3 rd | 4.00 | 4 th | 4.18 | 3 rd | 4.08 | 3 rd | .797 |
| Failure to pay for completed works | 4.00 | 3 rd | 4.07 | 3 rd | 3.71 | 9 th | 3.89 | 4 th | .621 |
| Shortages of resources | 3.50 | 8 th | 3.87 | 7 th | 3.88 | 4 th | 3.82 | 5 th | .716 |
| Considerable additional work | 3.33 | 17 th | 3.87 | 7 th | 3.76 | 6 th | 3.74 | 6 th | .443 |
| Escalations of material prices | 3.67 | 6 th | 3.67 | 10 th | 3.76 | 6 th | 3.71 | 7 th | .957 |
| Increases in the scope of work | 3.5 | 8 th | 3.93 | 6 th | 3.59 | 13 th | 3.71 | 7 th | .415 |
| Delay in design work | 3.5 | 8 th | 3.67 | 10 th | 3.82 | 5 th | 3.71 | 7 th | .704 |
| Late delivery of materials | 3.00 | 24 th | 4.00 | 4 th | 3.71 | 9 th | 3.71 | 7 th | .079 |
| Fluctuations in resources cost | 3.50 | 8 th | 3.67 | 10 th | 3.76 | 6 th | 3.68 | 11 th | .831 |
| Improper financial and payment arrangement | 3.83 | 5 th | 3.73 | 9 th | 3.47 | 17 th | 3.63 | 12 th | .519 |
| Organizational deficiencies | 3.50 | 8 th | 3.67 | 10 th | 3.59 | 11 th | 3.61 | 13 th | .951 |
| Poor contract management | 3.50 | 8 th | 3.60 | 15 th | 3.59 | 13 th | 3.58 | 14 th | .973 |
| Client initiated variations | 3.67 | 6 th | 3.67 | 10 th | 3.41 | 18 th | 3.55 | 15 th | .709 |
| Resources management problems | 3.50 | 8 th | 3.33 | 22 nd | 3.53 | 15 th | 3.45 | 16 th | .833 |
| Planning and Scheduling Problem | 2.83 | 26 th | 3.47 | 18 th | 3.65 | 11 th | 3.45 | 17 th | .325 |
| Slow decision making by project team | 2.83 | 26 th | 3.47 | 18 th | 3.53 | 15 th | 3.39 | 18 th | .240 |
| Inadequate contractor's experience | 3.50 | 8 th | 3.40 | 21 st | 3.29 | 20 th | 3.37 | 19 th | .904 |
| Poor site management and supervision | 3.17 | 19 th | 3.47 | 16 th | 3.35 | 19 th | 3.37 | 19 th | .851 |
| Inaccurate cost estimates | 3.33 | 17 th | 3.47 | 18 th | 3.24 | 23 rd | 3.34 | 21 st | .782 |
| Lack of communication | 3.00 | 24 th | 3.53 | 17 th | 3.29 | 20 th | 3.34 | 21 st | .514 |
| Build ability | 2.83 | 16 th | 3.33 | 22 nd | 3.12 | 25 th | 3.16 | 23 rd | .715 |
| Slow preparation and approval of shop drawings | 3.17 | 17 th | 3.00 | 27 th | 3.29 | 20 th | 3.16 | 23 rd | .706 |
| Inclement weather | 2.83 | 26 th | 3.27 | 24 th | 3.12 | 25 th | 3.13 | 25 th | .579 |
| Inaccurate site inspection. | 2.33 | 32 th | 3.07 | 26 th | 3.35 | 24 th | 3.08 | 26 th | .122 |
| Unforeseen site conditions | 2.50 | 30 th | 3.00 | 27 th | 3.12 | 25 th | 2.97 | 27 th | .318 |
| "Lowest bid wins" system | 3.17 | 19 th | 2.93 | 29 th | 2.82 | 30 th | 2.92 | 28 th | .863 |
| Labour disputes and strikes | 2.67 | 29 th | 3.13 | 25 th | 2.82 | 30 th | 2.92 | 28 th | .601 |
| Poor technical performance /workmanship | 3.17 | 19 th | 2.73 | 31 st | 2.88 | 29 th | 2.87 | 30 th | .579 |
| Subcontracting systems | 3.17 | 19 th | 2.80 | 30 th | 2.71 | 32 nd | 2.82 | 31 st | .382 |
| Liaisons problems among contracting parties | 2.50 | 30 th | 2.73 | 31 st | 3.00 | 28 th | 2.82 | 31 st | .529 |
| Restricted access | 1.83 | 33 th | 2.67 | 33 rd | 2.71 | 32 nd | 2.55 | 33 rd | .285 |

D. Analysis of Questionnaire

1) *Causes of delays:* Table III outlined thirty-three causes of delays from which construction stakeholders ranked the level of contribution of the identified factors to delay.

From Table III above, based on the ranking (R) of the average mean score for the stakeholders as shown above, it is discovered that the most frequent causes of delay as ranked by the group are financial related, delays such as financial/ cash flow difficulties (Av.MS = 4.21); financial difficulties faced by contractors and public agencies (Av.MS = 4.21). Others are frequent change order/ design (Av.MS = 4.08); failure to pay for completed works (Av.MS = 3.89) and shortages of material (Av.MS = 3.82). The least rated factor are poor technical performance/workmanship (Av.MS = 2.87); sub-contracting systems (Av.MS = 2.82); liaisons problems among contracting parties (Av.MS = 2.82) and restricted access (Av.MS = 2.55). It is therefore believed that, problem associated with funding are the major causes of

delay on construction project delivery.

A further test of agreement among the stakeholders' perceptions on the causes of construction delay in project delivery was carried out. The test however shows that at 5% significant level, (P > 0.05) there is no statistically significant difference in the opinion of the stakeholders on all the factors responsible for the causes construction delay. This therefore suggests that the stakeholders irrespective of their experience in the construction industry generally have similar opinions regarding the factors causing construction delay in project delivery.

2) *Effects of delays:* Table IV outlined seventeen effects of delays from which construction stakeholders ranked the frequency of their perceptions on the effect of delay.

TABLE IV
MEAN SCORE (MS) AND RANKS (R) OF THE EFFECTS OF DELAY ON PROJECT

| Hypothesized effects of delay | Clients | | Contractors | | Consultants | | Average | | Sig. |
|---|---------|------------------|-------------|------------------|-------------|------------------|---------|------------------|------|
| | MS | Rank | MS | Rank | MS | Rank | MS | Rank | |
| Extension of time on the project | 4.33 | 2 nd | 4.60 | 1 st | 4.35 | 1 st | 4.45 | 1 st | .588 |
| Cost overruns due to inflation and fluctuations | 4.50 | 1 st | 4.13 | 2 nd | 4.00 | 2 nd | 4.13 | 2 nd | .442 |
| Accumulations of interest rate on the capital to finance the project | 4.00 | 3 rd | 3.53 | 7 th | 3.88 | 3 rd | 3.76 | 3 rd | .475 |
| Wastage and under-utilization of man-power resources | 3.67 | 6 th | 3.67 | 4 th | 3.82 | 4 th | 3.74 | 4 th | .879 |
| Claims on the disturbance of regular progress of work by the main contractor | 3.67 | 6 th | 3.73 | 3 rd | 3.77 | 7 th | 3.72 | 5 th | .971 |
| Under-utilization of equipment and plant purchased for the project | 3.50 | 8 th | 3.60 | 5 th | 3.82 | 4 th | 3.68 | 6 th | .669 |
| Loss of confidence on the contract, thereby jeopardizing the reputation of the contractor in the case of future tendering chances | 3.50 | 8 th | 3.60 | 5 th | 3.71 | 8 th | 3.63 | 7 th | .870 |
| Late returns of income (Private developers) | 3.50 | 8 th | 3.47 | 8 th | 3.82 | 4 th | 3.63 | 7 th | .673 |
| Reduction in employment opportunities | 3.83 | 4 th | 3.13 | 10 th | 3.47 | 9 th | 3.39 | 9 th | .369 |
| Dispute between the parties involved. | 3.17 | 11 th | 3.40 | 9 th | 3.29 | 10 th | 3.32 | 10 th | .735 |
| Aids the decrease in the tempo of economic activities in the nation | 3.83 | 4 th | 3.07 | 12 th | 3.24 | 11 th | 3.26 | 11 th | .452 |
| Additional insurance charges | 3.00 | 13 th | 3.13 | 10 th | 3.18 | 12 th | 3.13 | 12 th | .918 |
| Extra taxes and dues due to delay | 3.00 | 13 th | 3.00 | 13 th | 3.06 | 14 th | 3.03 | 13 th | .977 |
| Insolvency of the contractor. | 2.50 | 16 th | 2.87 | 14 th | 3.18 | 12 th | 2.95 | 14 th | .288 |
| Inability to meet the minimum living standard | 3.17 | 11 th | 2.73 | 16 th | 3.00 | 15 th | 2.92 | 15 th | .648 |
| Arbitration/ Litigation | 2.83 | 15 th | 2.87 | 14 th | 3.00 | 15 th | 2.92 | 15 th | .910 |
| Total Abandonment of projects | 2.50 | 16 th | 2.53 | 17 th | 2.88 | 17 th | 2.64 | 17 th | .615 |

Based on the ranking (R) of the average mean score for the stakeholders as shown in Table IV, it is observed that the main effects of delay on project delivery are extension of time on the project (Av.MS= 4.45); Cost overruns due to inflation and fluctuations (Av.MS= 4.13); Accumulations of interest rate on the capital to finance the project (Av.MS= 3.76). The least rated factors are Inability to meet the minimum living standard (Av.MS= 2.92); Arbitration/ Litigation (Av.MS= 2.92) and Total abandonment of projects (Av.MS= 2.64).

A further test of agreement among the stakeholders' perceptions on the effects of construction delay on project delivery was carried out to determine the level of significance among the ranking. The test however shows that at 5% significant level, ($P > 0.05$) there is no statistically significant difference in the opinion of the stakeholders on all the effects of construction delay. This therefore suggests that the stakeholders irrespective of their experience in the construction industry generally have similar opinions regarding the resultant effects of construction delay in project delivery.

IV. DISCUSSIONS

The findings reveal that the factors that contribute mostly to the causes of construction delay in project delivery are financially related such as financial /cash flow difficulties and financial difficulties faced by contractors and public agencies. This is however in agreement with the views of [16]; [25] as well as [11] with the addition of difficulties in financing and payment for completed works. Others thus include frequent

change/order; failure to pay for completed works and shortages of materials due to lack of improper planning were ranked 3rd, 4th and 5th respectively are in agreement with the opinions of [15] as well as [10].

The least rated factors are unforeseen site conditions; inaccurate site inspection; liaisons problems among contracting parties and restricted access to site when observed from the average mean score as ranked by the stakeholders. The ranking of unforeseen site conditions and liaisons problems among the contracting parties as one of the least causes of delay however disagrees with the views of [19]; [15], which are of the opinion that unforeseen ground conditions and liaisons problems among contracting parties should be considered as one of the major factors causing delay in project delivery. This is probably due to the provision of adequate sum to cover unforeseen problems mostly at the foundation levels and the ability to effectively define the terms of agreement among the contracting parties before the award of the contract.

On the effects of delay, the most rated factors by the stakeholders are extension of time on the project and cost overruns due to inflation and fluctuations. This therefore agrees with the conventional views of [21] although Motaleb&Kishk [24]; Li, Love and Dawe [23]; Kaming et al, [22] further added that effects of delay are more on cost overruns than extension of time. This could be as a result of material cost increase due to inflation and inaccurate material estimation.

The contractors are not in agreement with the views of the consultants and clients on accumulation of interest

rate on the capital to finance the project and claims on the disturbance of regular progress of work by the main contractor as one of the major effects of delay on project delivery. This could be because if the project is not contractor-financed, the contractor is less bothered about but the accumulation of interest rate on the capital to finance the project. Claims on disturbance of progress of work by the main contractor on the other hand are rated more significantly by the contractor than the clients and the consultants since the contractor is aware that this could be an avenue to make more revenues.

V. CONCLUSION

Construction clients demand the timely completion of projects without delay or additional cost. The findings from the views of construction stakeholders is that financial related delays such as financial / cash flow difficulties faced by clients, contractors and public agencies are the top significant causes of delay in construction project delivery. Cost and time overruns and interest accumulation on capital are the most frequent effects of delay in the construction industry although the effects are slightly more on time overruns than cost overruns. This could be as a result of contractors' inability to honour contract deadlines and using shortages of material as an excuse or the consultants' inability to implement proper design and obtaining adequate knowledge about the usage of materials. Arbitration/litigation and total abandonment of projects were no longer seen to be the usual effects of delay as outlined by past researchers. This could be as a result of the implementation of risk management procedure which enables the parties to the contract to terminate, treat, transfer and tolerate contractual risk hence, the number of disputes and court proceedings on construction contracts have enormously declined.

Causes of delays which can be categorized as financial related e.g. client not being able to meet up with the payment of interim certificates; design related e.g. delays in design, frequent change orders; improper project logistic and planning e.g. shortages of resources, late delivery of materials, organizational deficiency and resources management, planning and scheduling issues may lead to extension of time on the project, accumulation of interest on capital to finance the project and cost overruns due to inflation and fluctuations. Other effects are wastages and under-utilization of man-power resources due to idle workmen just because of the non availability of material to work due to poor logistic arrangement.

Inadequate contractor experience, inaccurate cost estimates, poor technical performance and workmanship, lack of communication all leads to disputes between parties involve, arbitration and litigation including total abandonment of project. Inclement weather, restricted access and buildability issues are factors which leads to under-utilization of equipments and plants meant for the project including reduction in employment opportunities for construction workmen.

It is pertinent that adequate funding should be

guaranteed by any client before commencement of any project. This does not denote that the client must have all the funds at the conceptualization of the project. However, proper budgetary planning must be put in place to ensure adequate funding of the project otherwise alternative source of finance or project arrangement such as BOOT and BOT which allows contractors to participate in the design and financing of new projects. Sufficient planning and the establishment of sufficient quality control mechanisms should be put in place to avoid design changes. Appropriate time should be allocated to careful production of designs and complete tender documents, so as to improve the quality of contract documents with minimum errors and discrepancies and reduce delay during the construction stages. Design related issues such as changes in drawings; incomplete and faulty specification; clients initiated changes and general change order have very damaging effect on project delivery which invariably leads to delay and cost overruns. These are issues that can be controlled by proper design process management and timely decision making.

The research did not just go without some limitations among which were that only a particular city was sampled. However, this city happens to be the hub of commercial activities and a concentration of high construction activities. A larger study population would have been onerous information from respondents would have been difficult to collect and follow up. An important approach in a future research would be to examine each cause of delay and the associated impact of project delivery.

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