



## EVALUATION OF DELAY RELATED FACTORS IN NIGER DELTA DEVELOPMENT COMMISSION CONSTRUCTION PROJECTS IN UNIVERSITY OF PORT HARCOURT

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### ABSTRACT

This study evaluated the Delay Related Factors in Niger Delta Development Commission (NDDC) Construction Projects in University of Port Harcourt, Rivers State, Nigeria. The objectives include to analyse hostel construction project to determine their level of performance, and identify and analyse the delay factors in the face of the level of delay witnessed in the delivery of public sector Niger Delta Development Commission (NDDC) hostel projects in University of Port Harcourt, Choba, Rivers State. Descriptive statistics was partly used to analyze the performance data of the selected construction project from 2004 to 2012 which showed low performance due to high level of cost and time variations witnessed. The contributory factors to the low performance were identified. Based on this, five-point Likert's scale questionnaire was designed and distributed to 136 respondents for assessment on the level of effect of the contributory factors on cost and time variations. The t-test analysis of the delay factors show that all the identified factors significantly affected the performance of the NDDC hostel project with contractor related factors having the highest effect on the delay witnessed. The relative severity index also ranked contractor related factors as the highest effective factor to the level of delay witnessed in the NDDC hostel project delivery. The study therefore recommends honesty and transparency among the players in the public sector or government agencies and construction industry, maximum attention by contractors to detailed design before tendering for projects, stability in the market prices of construction materials and efficient and effective tendering process before projects are awarded.

**Keywords:** project delays, public sector, NDDC hostel, construction projects, contractors, clients,

### INTRODUCTION

There is no doubt that delay is one of the biggest problems in public sector construction projects. However, a public sector construction project can only be successful when it is completed on time, within budget and in accordance with specifications and to the satisfaction of those concerned. The measure of the success of such project can also be evaluated through its functionality and profitability to contractors without indemnity arising from claims and court processes (Andy, Andrew and Simon, 2014). Undoubtedly, delays occur in almost every public sector construction projects in Nigeria and the magnitude of these delays varies considerably from one project to another. Koushki, and Kartarn (2015), therefore described delay as a situation when the contractor, consultant, and client jointly or severally contribute to the non-completion of the project within the agreed contract period. They added that delays give rise to disruption of work and loss of productivity, late

completion of project, increased time and cost overrun, third party claims and abandonment or termination of contracts.

Nigeria is mainly dependent on oil and gas proceeds to finance construction projects. As a result, the oil boom of the mid 1970s and the subsequent fall in oil prices and global recession that followed in the early 1980s affected the country's economic activities. This was particularly reflected in the fluctuations in the volume of construction work undertaken over this period. However, the construction industry itself continues to occupy an important position in the structure of the Nigerian economy. An efficient construction sector is a prerequisite to effective national development since building, civil and industrial engineering works are usually the major contributors to Gross Fixed Capital Formation, Gross Domestic Products and National Employment (Olaloku, 2014). The growth of construction industry in the past two decades is an indication that the sector greatly contribute to the national development.

In a study by Olaloku (2014), it was observed that the relative large investment commitment to construction makes the industry an important source of demand generation and that the 'multiplier effect' (i.e. the great capacity to generate employment, income and expenditure in other sectors of the economy) constitutes another contribution it makes to the economy. This observation is further substantiated by the fact that annual growth in the Nigerian construction industry in 1974 was 26.9% and the gross domestic product grew by only 13.1%, but in 1984, construction declined by only 27% and the GDP declined by only 11% in that period (Aibinu&Jagboro, 2012). This highlights the fact that the construction industry continues to be a major stimulant in the country's economic growth as a result must be critically evaluated to enhance its contribution to the national development through successful execution of projects, especially in the public sector. This strong interrelationship further strengthens the need to ensure that project planning is cost and time effective. However, research has shown that excessive project cost and time overruns have been too evident due to project delays. Hence, this study was set to investigate delay related factors in construction project implementation for improved success.

### **Problem Statement**

Delays in construction projects are easily noticed in most construction projects implemented in Nigeria, especially in Port Harcourt Rivers State. This is why critics of the Nigerian Construction Industry always emphasize on the rate of delays witnessed in construction project delivery which hampers national development.

Due to the level of economic, social, political and ethnic problem facing the country in recent times, research revealed that project funds are not been released promptly and adequately and this has been the major problem in the completion of construction projects within the planned duration in Nigeria, especially in Port Harcourt, Rivers State. Literature review and field study also postulates that most contractors of these construction projects tend to deviate from the project plan/specifications and this has been attributed to their level of qualification, errors in the Bill of Quantities, inappropriate or insufficient funding, use of non-professionals in the planning and implementation of these projects among others. Delay in public sector construction projects could be adduced to myriad of factors and its effects usually have negative consequences on the project delivery such as poor business results, low return on investment, etc.

Construction project delays are consistently dynamic and uncertain. Several controllable and uncontrollable factors have adversely affected the Niger Delta Development Commission (NDDC) University hostel project schedule and cause delays and cost overrun. These delays have created negative effects on the project performance. Schedule delays in the completion of public sector construction projects might be a major difficulty for contractors handling them, thus leading to costly disputes and adverse relationships between project participants. The study intends to investigate if adequate planning and sincere budget implementation are activated, and whether construction projects would be completed and made functional within the planned

duration and cost. It is in an attempt to prove this assertion, and to also identify other variables that may be responsible for project delays that this research work was mounted.

### **Objectives of the Study**

The aim of this study is to investigate and evaluate the major delay related factors in public building construction project delivery in Port Harcourt, Rivers State so as to proffer preventive and remedial measures for better management of public sector building construction projects. To achieve this, the following specific objectives are to be achieved;

- i. To identify and analyze the possible effects of major causative factors responsible for delays in the public sector building construction project delivery, and their effects on the economic development in Rivers State.
- ii. To determine the level of effects that public sector building construction project delays have on the economic development and performance objectives of such projects in Port Harcourt, Rivers State.

To achieve the objectives, the following research questions raised:

- i. What could be the factors that precipitate delays in public sector construction projects?
- ii. To what extent can delays in construction projects significantly affect successful completion of public sector construction projects?

In order to answer the research questions, the following hypotheses were formulated;

H<sub>01</sub>: Finance related delay factors do not have significant effect on the quality of public sector construction project delivery.

H<sub>02</sub>: Material related delay factors do not have significant effect on the budgeted cost and time of public sector construction project delivery.

H<sub>03</sub>: Contractor related delay factors do not have significant effect on the performance of public sector construction project delivery.

H<sub>04</sub>: The effect of equipment related delay factors on the delivery of public sector construction project is not significant to mar the project success.

H<sub>05</sub>: Client related delay factor is not significant to affect the success of public sector construction projects.

### **Justification of the Study**

The justification for using the NDDC prototype hostel projects of UNIPORT is because of undergraduate accommodation for students in Nigerian higher institutions. The study will guide the construction companies on the avenues and needs to expedite action in students' hostel projects execution by addressing delay related factors. The six factors used for the study are perceived to be endemic to delay in construction projects in Port Harcourt, Rivers State Nigeria because of the city's vulnerability to environmental and socio-economic challenges.

The research findings and recommendation will educate and enlighten construction project stakeholders on the causes and effects of delays on construction projects and the strategies for overcoming the problems so that construction projects can be successfully realized. In this way, construction firms, government and non-governmental bodies (NGO's) who want to embark on construction projects will do that with confidence bearing in mind that the project can be realized within budget and given time frame. The ideas generated from the study can still be extended to other fields of human activities so that positive results can be achieved.

The academic scholars will derive from the exploratory dimension of the study. An attempt to establish yardsticks in averting possible delays in construction project delivery. The contribution to knowledge will also help in establishing policies that will engender speedy project completion.

## **2.0 CONCEPTUAL REVIEW**

This study is based on the concept that projects realized behind the planned duration is considered delayed, even if the project was completed. Based on this, Schwelbe (2008) posited that project delay measured based on the failure to achieve project within planned time. There is no doubt that delayed projects attract cost overrun and poor quality of work. This is because project realization within time, cost, specification and user

acceptance are known criteria for judging project success. However, Kezner (2003) added that a successful project implementation occurs if the project, comes on-time, on-budget, achieves all the goals originally set for it, and is adopted and used by the clients for whom the project is intended. It implies the successful achievement of time and cost objectives, as well as the quality of the project process, Erling et al (2006). Turner (2004) identifies on time, within budget and to specification as the standard for judging success. The above literatures points to Steinfort (1993) conclusion that project delays needs to be investigated from the perspective of nature of project team, stakeholders as well as from that of their client benefit and in the theoretical and empirical/practical review of related delay factors on any project.

Based on the above literatures this study deemed it fit at this point in time to make a theoretical and empirical review of the delay factors and effect of delays in public sector construction projects with reference to the NDDC Prototype University Hostel project in University of Port Harcourt, Rivers State.

### **Construction Project Delays**

There are a number of definitions for delay. In the construction management context, the simplest definition of a delay was made by Mubarak (2015) as “an event or a condition that results in finishing the project later than stipulated in the contract”. Callahan et al. (1992) define delay in construction claims as “the time during which some part of the construction project has been extended or not executed owing to an unexpected event”.

In another study, Trauner et al. (2009) describe delay as “to make happen later than expected or to not act timely”. It is usual for delays occur on construction projects. General, delay of a construction project is the late completion of works as compared to the planned schedule or contract schedule. It possibly could be interpreted as a loss of time. Time refers to the duration for completing the construction project. Time in a construction project is the construction period. When the project period is delayed, it means the project cannot be completed as planned. Delays in construction project will lead to either extension of time, cost overrun, non-completion of contract, or a combination of two or more than the factors mentioned above.

The duration of a construction project is an important, factor to set forth when entering into a construction agreement. If a contractor works with a planned parameter, he or she should be able to finish the construction project in a timely manner. However, compared to other industries, it is difficult to complete a construction project in which many constructions and numerous unknown variables exist (Koushki, *et al* 2015). When such difficulties arise, construction schedules are delayed, and consequently delay claim occurs.

Delays in construction may be caused by the client, the contractor, and the consultants, a third party or by the forces of nature. They may occur early or late in the job alone, or with the other delays. According to Chan and Scott, (2015) negotiating a fair and timely damage settlement beneficial to all parties. Thus, the ascertainment of the period delay serves as basic information from the appointment of responsibility, which may be a highly complex operation in cases with concurrent causes (Shi, Cheug and Arditi, 2012). In line with this, assigning responsibility project delays is critical to the allocation of responsibility for time- related’ cost (Al-Saggaf, 2012). In this respect, when a delay claim occurs; it is very important to assign responsibility and magnitude to delays that exist, and it is often difficult to analyze the ultimate liability in delay claims (Kraiem et al 2007). Lost productivity or loss of productivity is one of the most important causes of delay among the various causes of construction delays.

#### **Types of Delays in Construction Projects**

According to Abd-Majid et al (2007), there are three basic ways to classify delays.

- i. Critical or non-critical
- ii. Excusable or non-excusable
- iii. Compensable or non-compensable

iv. Concurrent or non-concurrent

In the study by Kartam (1999), he classified project delays into three main groups in terms of their origin, timing and compensability. These groups are as given in the following:

Delays classified by their origin: Owner caused delays (OCD), contractor caused delays (CCD), and third party caused delays (TPCD)

Delays classified by their timing are concurrent delays (CD) and non-concurrent delays (NCD).

Delays classified by their compensability are excusable delays (ED) which are also classified in itself as excusable compensable delays (ECD) and excusable non-compensable delays (ENCD), and Non-excusable delays (NED).

### **Critical versus Noncritical Delays**

While several authors (Mubarak, 2015; Kelleher, 2005; Levy, 2016) categorize delays into three groups as Excusable and Non-excusable, Compensable and Non-compensable and Concurrent and Non-concurrent; authors like Trauner et al., (2009); and Callahan et al., (1992) add one more category to these three groups which is Critical and Non-critical delays.

According to Trauner et al., (2009) and Callahan et al., (1992), the primary 'focus in any study of delays in a project is to see if the delay affects the progress of the entire project or the project completion date. The authors' further state that delays which result in extended project completion are considered critical delays, and delays that do not affect the project completion date are known as non-critical delays. Trauner et al. (2009) further claim that the issue of critical delays emerges from the Critical Path Method (CPM) scheduling. All projects have a critical path and if these critical activities on the path are delayed then the completion date of the project will be extended.

### **Excusable versus Non-excusable Delays**

Construction delays are basically either excusable or non-excusable. Callahan et al. (1992) and Trauner et al. (2009) claim that whether a delay is excusable or non-excusable depends on the clauses in the contract. The authors note that standard construction contracts specify types of delay that will allow the contractor to an extension of time. For instance, in some contracts, unexpected or unusual weather conditions are not considered as excusable and so these contracts do not allow for any time extensions. 'According to Trauner et al. (2009) an excusable delay, in general, is owing to an unforeseeable event beyond the contractor's or the subcontractor's control. The authors further explain that delays resulting from the following issues are known as excusable: General labor strikes, Fires, Floods, Acts of God, Owner-directed changes, Errors and omissions in the plans and specifications, Differing site conditions or concealed conditions, unusually severe weather, Intervention by outside agencies, Lack of action by government bodies, such as building inspection.

In another study, Levy (2016) adds two more excusable delays to the above list as: Illness or death of one or more of the contractors, Transportation delays over which the contractor has no control. Moreover, Kelleher (2005) supplies the above list with two more delays as: Epidemics, Quarantine restrictions. Mubarak (2015) defines non-excusable delays as "delays that are either caused by the contractor or not caused by the contractor but should have 'been foreseen by the contractor". He also points out that a non-excusable delay does not entitle the contractor to either a time extension or monetary compensation. Trauner et al. (2009) enumerate some examples of non-excusable delays as follows: Late performance of subcontractors, Untimely performance

by suppliers, Faulty workmanship by the contractor or subcontractors, a project-specific labor strike caused by the contractor's unwillingness to meet with labor representatives or by unfair labor practices.

In another observation, Mubarak (2015) adds other examples to the above list as: Contractor cash-flow problems, Accidents on the site caused by the contractor's negligence or lack of preparations, late delivery of the contractor's finished materials and equipment.

As stated in the excusable delays, again, the contract is the determinant whether or not a delay is considered non-excusable. Therefore, Trauner et al. (2009) warn contractors that before signing the contract it should be clearly understood which delays are defined as excusable and which as non-excusable.

### **Compensable versus Non-compensable Delays**

As Mubarak (2015) states, compensable delays are caused by the owner or the designer (engineer or architect). The contractor is typically entitled to a time extension or recovery of the costs related with the delay or both. Factors which are specified in the contract resulting in delays such as differing site conditions, changes in the work, access to the site are some examples of compensable delays. According to Trauner et al. (2009) only excusable delays may be compensable.

The authors further explain non-compensable delays as those which despite being excusable do not entitle the contractor to any compensation. Many authors such as Barriè and Paulson (1992) and Mubarak (2015), point out that excusable non-compensable delays are normally beyond the control of either owner or contractor such as unusual weather conditions, natural disasters, wars, national crises, floods, fires or labor strikes. They add that usually the contractor is entitled to a time extension, but not additional compensation.

Trauner et al. (2009) emphasize that if a delay is compensable or non-compensable basically depends on the issues of the contract. The contract determines the types of delays in detail and for which delay the contractor, is entitled to time extension or monetary compensation.

### **Concurrent Delays**

Mubarak (2015) states that a concurrent delay includes a combination of two or more independent causes of delay occurring within the same time frame. According to the author, a concurrent delay often includes an excusable delay and a non-excusable delay. Another definition made by Callahan et al. (1992) is that "more than one delay contributed to the project delay, not that the delays necessarily occurred at the same time". Although this type of 'delays seems like a simple issue, still there is no clear definition of concurrent delays. According to Trauner et al. (2009) concurrent delays are simply defined as "separate delays to the critical path that occur at the same time". Levy (2016) names this type of delays as overlapping delays. Nguyen (2007) also points out that simultaneous delays, commingled delays, and intertwined delays are other names used for concurrent delays.

Levy (2016) further indicates that concurrent delays may be generated by the contractor or by the owner, but if it happens that both parties are responsible, and these delays overlap then neither party can be able to retrieve damages.

### **Possible Effect of Time Overrun (Delay) on Project Stakeholders**

Time overrun have obvious effect on the major stakeholders in particular and the public construction projects in general. To the clients, time overrun/delay implies added cost. This could result in less benefit from the

project. To the contractor, it implies loss of time and effort in preparing for the project. It can also mean that the inability of the contractor to deliver value to money paid to him and could tarnish their reputations which may lead to loss of confidence by the client. It could also jeopardize their chances of winning future contracts. Then to the construction industry, delay in projects could mean abandonment of project and a decline in construction project activities, bad reputation and inability to secure projects due to high risk of delay or time overrun (Nwachukwu, Echeme&Okoli, 2010). All these consequences affect the viability of construction projects and national development. Hence, delayed construction projects and its effect on national development still remain a concern to academic scholars.

### **Project Funding Related Delays Factor**

Finance has been identified as one of the factors responsible for construction project delays. According to Abd-Majid et al (2014), the factor of inadequate fund allocation and delayed payment to subcontractor/suppliers are contributory to causes of delays in construction projects. Long, et al (2014) also identified the factor of high interest rate as a contributor to project delays. Mansfield, Ugwu, and Doran (2014) identified the factor of contractor's financial difficulties as having a high influence in causing project delays.

Chan and Scott (2015), revealed that the factor of the client's financial difficulties and monthly payment difficulties to contributors cause project delays. Koushki, et al (2015) revealed that the factors of unreasonable constraints to client have high influence as a cause of project delay. Frimpong, et al (2013) identified the factor of monthly payment difficulties as the most important factor that contributes to project delays.

Based on the foregoing literature review, this researcher wishes to structure questions that will be given to knowledgeable respondents to respond to in order to confirm the assertions as claimed by these authors. The list below summarizes the delays related to projects due to finance as a factor responsible for project delays:

- i. Error in the Bill of Quantities
- ii. Inadequate fund allocation
- iii. High interest rate
- iv. Contractor's financial difficulties
- v. Client's financial difficulties
- vi. Unreasonable constraints to client
- vii. Monthly payment difficulties
- viii. Delay payment to suppliers and subcontractors

### **Material Related Delays Factor**

The Category of material related delays was identified as one of the groups of causes of delays in construction projects. All factors that are related to material were categorized under this group of causes. One of the sources used to identify the factors under material groups of causes was the literature review. Several studies examined by the researcher identified the factors of material related delays to include the following ones. Abd-Majid and MaCaffer (2007) identified that factors like shortage of materials, poor quality of materials, poor procurement of material, late delivery of materials, and unreliable suppliers contribute to project of delays.

Also, according to Chan et al (2015), factors of shortage of material and poor procurement of materials are contributing factor to construction delay. Mansfield, Ugwu, and Doran (2014), in their study showed that shortage of material, poor quality of material, escalation of material prices and late delivery of materials are causes of delays in construction projects. Odeh et al, (2012) identified the factor of poor quality of material as having a high influence on delays. Koushki, et al (2015) revealed that shortage of construction materials, poor quality of materials, and poor procurement of materials are causes of delays in project delivery.

Frimpong, et al (2013) identified the factor of poor procurement of materials as contributory to delays in projects. Wiguna and Scott (2005) identified the factor of escalation of material prices as one factor that

contributes to project delays. Based on these literature reviews, there are seven factors of material related delays as listed below:

- i. Shortage of construction materials
- ii. Poor quality of construction materials
- iii. Poor procurement of construction materials
- iv. imported construction materials
- v. Escalation of material prices
- vi. Late delivery of materials, and
- vii. Unreliable suppliers

#### **Labour Related Delays**

Several factors of delays that relate to labour can be distinguished and categorized under this group. The same method of establishing the factors of material related delays were used in this group. According to Abd-Majid et al (2014) slow mobilization of labour, labour supply, absenteeism strike, and low motivation and morale are the critical factors that contribute to causes of delays. Odeh et al (2012) in their research identified the factors of labour productivity and labour supply as contributor to causes of delays. Chan et al (2015) identified the factors of shortage of skilled labour as the most important factor that contributed to causes of delays. Based on this literature review, there are seven factors of labour related delays, and which are summarized below:

- i. Slow mobilization of labor
- ii. Shortage of skill labor
- iii. labour productivity
- iv. Labour supply
- v. Absenteeism
- vi. Strike
- vii. Low motivation and morale

#### **Equipment Related Delays Factor**

The methodology of establishing the factors of this group of causes was similar to that of the material related delays and labour related delays. One of the sources used to identify the factors under equipment group of causes was the literature review. There are several studies by numerous researchers that identified the factors of equipment related delays. Mansfield, Ugwu, and Doran (2014) identified the factors of insufficient numbers of equipment, frequent equipment breakdown, and equipment allocation problem as the most significant factors that contribute to causes of delays. Abd-Majid and McCaffer (2007) identified the factors of equipment breakdown, improper equipment, slow mobilization, and equipment allocation problem as contributors to causes of delays. Accordingly, Chan et al (2015) identified the factors of shortage of equipment and improper equipment as factors that contribute to causes of delays.

Odeh et al (2012) identified the factor of equipment allocation problem having influence on causes of construction delays. Based on the literature review, there are seven factors of equipment related delays as shown in the list below.

- i. insufficient number of equipment
- ii. Frequent equipment breakdown
- iii. Shortage of equipment parts
- iv. improper equipment
- v. Slow mobilization of equipment
- vi. Equipment allocation problem
- vii. inadequate modern equipment

#### **Contractor Related Delay Factor**



The methodology of establishing the factors of this causes was similar to that of the material related delays, equipment related delays, and finance related delays. One of the sources used to identify the factors under contractor group of causes was the literature review. Not all the possible factors could be cited.

Numerous researchers identified the factors of contract related delays that contribute to causes to delays. Abd-Majid et al (2007) identified the factors of inadequate contractor experience, inappropriate construction methods, and improper project planning and scheduling, and unreliable subcontractor as contributors to causes of delays. Long, et al (2014) identified the factors of inadequate contractor experience, inappropriate construction methods, inaccurate time estimating, inaccurate cost estimating, incompetent project team, unreliable subcontractor, and obsolete technology that contribute to causes of delay in construction projects.

According to Odeh et al (2012) factors of inadequate contractor experience, inappropriate construction methods, poor site management and supervision, and unreliable subcontractor as contributors of causes of delays Chan et al (2001) identified the factors of poor site management and supervision and improper project planning and scheduling that contribute to causes to delays. Mansfield, Ugwu, and Doran (2014) identified the factor of improper project planning and scheduling as factors of contractor related delay. Based on the literature review, there are nine factors of contractor related delays and these are outlined in the list below.

- i. Inadequate contractor experience
- ii. Inappropriate construction methods
- iii. Inaccurate time estimate
- iv. Inaccurate cost estimate
- v. Poor site management and supervision
- vi. improper project planning and scheduling
- vii. Incompetent project team
- viii. Unreliable subcontractor
- ix. Obsolete technology

#### **Client Related Delay Factor**

One of the sources used to identify the factors under client group of causes was the literature review. Not all the possible factors could be cited from the literature. Based on literature review, several studies identified the factors of client related delay.

According to Odeh et al (2012), the factors of change orders, and slow decision making by client contribute to causes of delays. Long, et al (2014) identified the factors of client interference, lack of capable representative, lack of communication and coordination, and improper project feasibility study that contribute to causes of delays in construction project. Mansfield et al (2014) identified factors of change orders and slow decision making by client as contributors to causes of delays: Koushki, et al (2015) identified factors of change in orders, improper project feasibility study and lack of experiences of client in construction project have high influence to the causes of delays. Based on the literature review, there are seven factors of client related delays namely:

- i. Slow decision making by client
- ii. Lack of experience of client in construction
- iii. Change orders
- iv. Client interference
- v. Lack of capable representative
- vi. Lack of communication and coordination
- vii. Improper project feasibility study

#### **Consultant Related Delays Factor**

To identify the factors of causes of delays related to consultant responsible based on literature review; several studies identified those factors of consultant related delays. According to Long, et al (2014) factors of

inadequate consultant experience, inadequate project management assistance, incomplete drawing and detail design, and inaccurate, site investigations are contributors to causes of delays.

According to Odeh et al (2012) factors of slow response and poor inspection are factors of consultant related delays. Mansfield et al (2014) identified the factors of poor design and delay in design, slow response and poor inspection, and incomplete drawing and detailed design that contribute to causes of delays in construction project. The following list summarizes these factors:

- i. inadequate consultant experience
- ii. Poor design and delays in design
- iii. Slow response and poor inspection
- iv. Incomplete drawing/detail design
- v. inaccurate site investigation
- vi. Inadequate project management assistance

#### **External Factors of Delays**

The methodology of establishing the factors of this group of causes was similar to that of the material related delays, labour related delays. One of the sources used to identify the factors under external group of causes was the literature review. Several studies identified the factors that contributed to causes of delays.

According to Odeh et al (2012) factor of unforeseen ground condition, problem with neighbors, and weather condition are contributors to causes of delays. Long et al (2014) identified factors of unforeseen ground condition, inflation/price fluctuation, slow site clearance; and weather conditions are factors of external delays. Wiguna et al (2005) identified the factor of inflation/prices fluctuation having high influence to causes of delays. Ogunlana et al (2013) identified the factors of problems with neighbors that contribute to causes of delays. Al-Momani. (2000) identified the factor of weather condition as contributors to causes of delays in construction, projects. Based on the literature review, there are seven factors of external related delays.

- i. Unforeseen ground condition
- ii. Unexpected geological condition
- iii. Inflation/prices fluctuation
- iv. Slow site clearance.
- v. Problem with neighbors
- vi. Weather condition.
- vii. Conflict

In summary, a total of fifty seven factors were identified based on the literature review which contributed to delays in construction project delivery. The authors did a lot of work on construction projects which could be private or public sector projects. They failed to specifically consider factors of delays in public sector construction projects which is a major index for measuring budget performance and national development. This study was done specifically to identify and evaluate the variables of delays in public sector construction projects. For the purpose of this study, effort were focused on factors that can cause delays in public sector construction projects, especially the NDDC University Hostel projects in University of Port Harcourt, Choba Rivers State. They include;

- b. Finance related factors,
- c. Material related factors,
- d. Contractor associated delays,
- e. Equipment/ technical related delays,
- f. Client associated delays.

The variables under the above identified delay factors and the research authors (sources) associated with the factors are displayed in the tables below;

#### **Finance Related Factors ( $X_1$ )**

| Associated Variables                    | Authors And Year                      |
|---|---------------------------------------|
| Error in the initial Bill of Quantities | NDDC Project Report (2007)            |
| Inadequate fund allocation              | NDDC Project Report (2012)            |
| High interest rate                      | Frimpong, Oluwoye and Crawford (2013) |
| Contractor's financial difficulties     | Frimpong, Oluwoye and Crawford (2013) |
| Client's financial difficulties         | Mansfield, Ugwu, and Doran (2014)     |

### Materials Related Factors ( $X_2$ )

|  |                                      |
|--|--------------------------------------|
| Shortage of construction materials         | Abd-Majid and MaCaffer (2007)        |
| Poor procurement of construction materials | Odeh and Battaineh (2012)            |
| Escalation of material prices              | Mansfield, Ugwu, and Doran (2014)    |
| Unreliable suppliers                       | Mansfield, Ugwu, and Doran (2014)    |
| Poor quality of construction materials     | Koushki, Al.Rashid and Kartam (2015) |

### Contractor Related Delay Factors ( $X_3$ )

|                                      |                               |
|--------------------------------------|-------------------------------|
| Inadequate contractor experience     | Abd-Majid and MaCaffer (2007) |
| Inaccurate time estimate             | Abd-Majid and MaCaffer (2007) |
| Inaccurate cost estimate             | Long et al (2014)             |
| Obsolete technology                  | Long et al (2014)             |
| Poor site management and supervision | Chan and Scott (2015)         |

### Equipment Related Factors ( $X_4$ )

|                                  |  |
|----------------------------------|--|
| Frequent equipment breakdown     | Mansfield, Ugwu, and Doran (2014)                      |
| Slow mobilization of equipment   | Abd-Majid and MaCaffer (2007)                          |
| Improper equipment               | Abd-Majid and MaCaffer (2007)<br>Chan and Scott (2015) |
| Insufficient number of equipment | Mansfield, Ugwu, and Doran (2014)                      |
| Shortage of equipment parts      | Chan and Scott (2015)                                  |

### Client Related Delay Factors ( $X_5$ )

|  |   |
|--|---|
| Slow decision making by client         | Odeh and Battaineh (2012)   |
| Change orders                          | Odeh and Battaineh (2012)<br><br>Mansfield, Ugwu, and Doran (2014) Koushki, Al.Rashid and Kartam (2015) |
| Improper project feasibility study     | Koushki, Al.Rashid and Kartam (2015)  |
| Lack of communication and coordination | Long et al (2014)   |
| Lack of capable representative         | Long et al (2014)   |

However, Hinze (2016) posited that the causes of construction delays are numerous, including strikes, adverse weather, late decisions by the owner, unforeseen changes affecting construction duration and so on. He asserts that delays affect unfavorably all the contracting parties, the owners get their buildings later than planned, contractors are affected adversely due to increased construction costs. But the study focused on the five (5) above identified major construction delay factors for data collection and analysis. This is based on the fact that these factors corroborate with the findings of the field survey and information gathered from the NDDC University Hostel Project in University of Port Harcourt, Rivers State (the project under study).

Although many studies have been carried out on the delay related factors or success factors of hostel projects, but without evaluating the extent of variations of the key performance indicators and reasons for such variations. Also, the contributions of the individual delay related factors on the performance level of NDDC hostel project implementation and the relationship between these delay factors and the economic development of Rivers State has not been ascertained. Hence, the study intended to study and fill these existing gaps as per NDDC construction projects in Rivers State, Nigeria.

## 3.0 METHODOLOGY

The method of research design adopted is the survey technique designed to be observational as well as exploratory. The observational method is aimed at obtaining a better understanding of the delay factors that inhibit the successful implementation of the public sector construction projects in Port Harcourt, Rivers state through the evaluation of their past performances. The aim is to make better suggestions on the best way to improve future performances based on the analysis. To this end, questionnaires were designed using 5-point Likert's scale to determine the effects of these identified delay factors on the performance of public sector construction projects in Port Harcourt.

On the other hand the exploratory design was adopted to see the extent to which the multivariate techniques of student t-test and correlation analyses can be applied in the analysis of delay factors in public construction projects. In the light of the above, it is considered critical responsibility of the academia to probe into problem situations possibly to establish the causal factors and the nature of the association existing between these factors. It is believed that a problem whose causal factors have been identified is at least half solved.

### Study Population and Sampling Technique

However, the population of the study is estimated at two hundred and thirty seven (237) personnel directly involved in the planning and execution of the NDDC Prototype University Hostel project, UNIPORT comprising of the site supervisors, craftsmen (foremen), Contractors, Consultants, clients (NDDC, UNIPORT staff).

By applying the sample size formula ( $n = N/1+N_e^2$ ), the study sampled one hundred and fifty (150) respondents out of the 237 estimated participants (population) of public sector construction projects to assess the questionnaire developed for data collection on the identified delay factors. This was also done using stratified random sampling technique.

### Method of Data Collection

The data used in this research are both primary and secondary data. The primary source is the questionnaire, while the secondary data were collected from various sources which include the project performance reports from contractors and consultants of NDDC Prototype University Hostel project, River state Ministry of Works and Housing. Other sources of secondary data (literature) are project management textbooks, journals, internet, and research projects, etc. Also efforts were made to collect data from workshops/conferences and seminar presentations. To a large extent, these formed the major sources of most of the literature evidences used as the basis for the analysis carried out in this study.

**Table 3.1 Allocation of Questionnaires to Respondent Groups.**

| Category of Respondent                              | Allocation |
|---|------------|
| Contractors   | 30         |
| Consultants   | 30         |
| site supervisors                                    | 30         |
| craftsmen (foremen)                                 | 30         |
| clients (NDDC project support staff& UNIPORT staff) | 30         |
| <b>Total</b>  | <b>150</b> |

### Validity Test

Our research instrument (via questionnaires) was duly evaluated by the research supervisors and its administration in the selected area under study. Besides, the instrument was also sent to research professionals outside the pressure audience, and the result also confirms the genuineness and authenticity of the research instrument both in framing and content.

### Reliability Test

Several methods of ascertaining reliability of data exists, but for the purpose of this study, the test-retest method was adopted after the instrument has been retrieved from the sample used for the pilot study. Hence, the research instrument was administered to a certain group of the respondents, the result collected and after a month, the same instrument was also given to the same respondent group. The two results were correlated and a result of  $r = 0.889$  confirms the reliability of the research data.

### Method of Data Analysis

Most of the data collected from the NDDC prototype hostel construction project performance reports were analyzed using descriptive statistics. The t-test was adopted to determine the effect of each category of causative factors on the performance of the NDDC prototype hostel project in University of Port Harcourt, Rivers State. While the correlation analysis was adopted in ascertaining the level of relationship existing between each category of delay causative factors and public sector economic development of Rivers state, Nigeria.

Also, Relative Severity Index (RSI) was adopted in ranking the categories if these factors in order to determine their level of severity or effectiveness in causing delay in public sector construction projects with particular reference to NDDC Hostel construction project used as a case for this study. To apply the formula for RSI, the respondents' ranking were multiplied together to determine the Critical Factor Index (CFI) as shown in equation 3.1;

$$CFI = \sum w = [(F_1 * n_1) + (F_2 * n_2) + (F_3 * n_3) + (F_4 * n_4) + (F_5 * n_5) + \dots + (F_n * n_n)] \dots \dots \dots (1)$$

Where;  $\sum w$  = summation of the weight given to each category of the causative factor

$F_n$  = Score ranking,  $n_n$  = Corresponding number of responses.

$$\text{Hence, } RSI = \frac{100 \sum (F_x)}{A_F} \dots \dots \dots (2)$$

Where; F = the frequency of the score (x) for the factor under consideration; A = highest weighting factor (i.e. 5); F = total number of sample.

### Decision Rule for Testing Hypotheses

The null hypothesis is accepted if the p-value is less than 0.05 the level of significance.

## 4.0 Results and DISCUSSIONS

The data collected were analyzed and presented as follows;

### NDDC Prototype Hostel Construction Project in University Of Port Harcourt, Rivers State

The table below presents the problem confronting the NDDC hostel project being constructed in UNIPORT, Choba.

**Table 4.1 Analysis of the Performance of NDDC Prototype Hostel Construction Project**

| Year of Contract Award | Name of Contractor    | Contract Sum (N) | Additional Contract Sum (N) (Variation) | % Variation | Project Duration        |
|------------------------|-----------------------|------------------|---|-------------|-------------------------|
| 2004                   | Mosaf Nig. Ltd        | 427,000,000      | -                                       | -           | 72 weeks<br>(18 months) |
| 2007                   | Fezinat Services Ltd. | 730,785,409.20   | 303,785,409.20                          | 32.25       | 72 weeks<br>(18 months) |
| 2012                   | Fezinat Services Ltd. | 1,369,090,667.25 | 638,305,258.05                          | 67.75       | 72 weeks<br>(18 months) |
| Total                  |                       |                  | 942,090,667.25                          |             |                         |

**Source:** NDDC Prototype University Hostel Project Report (NDDC Document)

From Table 4.1, the project experience high level of delay from 2004 to 2012 (8 years). It also show the level of cost variation from 2004 to 2007 is 32.25%. However during this period, no work was done on site. Between 2007 and 2012 there was another increase in cost to the tune of 67.75%. These cost overrun happened

because of the delay inherent in this NDDC Prototype Hostel project in UNIPORT, Choba. According to the performance report, the project was delayed because of the following reasons;

- i. there was major error in the Bill of Quantities (BOQ) submitted by Messrs Mosaf Nig. Ltd. The quantity of the floors were omitted in the BOQ before the award. It was later discovered and this contributed to the level of delay initially witnessed in the project commencement date after 25% mobilization fee has been released to the contractor. Hence the site was abandoned for 3 years (from 2004 to 2007).
- ii. the contract was re-awarded to Fezinat Services Ltd. At an upward review of N730, 785,409.20 in 2007. The NDDC hostel project was also delayed when Fezinat could not get the due payment for the milestone achieved according to the contract agreement. This is due to the amortization of the mobilization paid to Messrs. Mosaf Nig. Ltd. (former contractor). This made the contractor to move out of site for 5 years (from 2007 to 2012).
- iii. in 2012, the hostel project was re-awarded to Fezinat Services Ltd at an upward review of N1,369,090,667.25.

However, the delay from 2004 to 2012 attracted a cost of N942, 090,667.25. This cost overrun could have been avoided if the project was not delayed for eight years.

Based on the analysis of the project performance data and some related literatures, the study identified finance, materials, contractor, equipment and client related issues as the contributory factors to the delays experienced in the successful implementation of the NDDC prototype hostel construction project in UNIPORT, Choba. In order to determine the level of effect posed to the project by these identified predetermined factors, questionnaire was designed and served to the personnel directly involved in the planning and implementation processes of the project.

### Analysis of the Responses from the Questionnaire Distributed

The following table show the statistics of the questionnaire distribution and response rate for the one hundred and fifty (150) respondents selected for assessment of the drafted questionnaire.

| Category of Respondent               | No. of Questionnaire Distribution | No. of Questionnaire Retrieved |
|--------------------------------------|-----------------------------------|--------------------------------|
| Contractors                          | 30                                | 24                             |
| Consultants                          | 30                                | 30                             |
| Site supervisors                     | 30                                | 28                             |
| Craftsmen (foremen)                  | 30                                | 27                             |
| Clients (NDDC project support staff) | 30                                | 27                             |
| <b>Total</b>                         | <b>150</b>                        | <b>136</b>                     |

**Table 4.2 Statistics of Questionnaire Distribution to Respondent Groups.**

Table 4.2 show that a total of 150 questionnaires were distributed and 136 returned representing 90.67% response rate. This form the basis for any subsequent analysis on the primary data collected for this study. The t-test and the correlation analyses results were displayed in the following tables as follows;

**Table 4.3 Descriptive Statistics**

|    | N   | Minimum | Maximum | Mean    | Std. Deviation |
|----|-----|---------|---------|---------|----------------|
| X1 | 136 | 5.00    | 25.00   | 19.7794 | 3.98272        |

|                    |     |       |       |         |         |
|--------------------|-----|-------|-------|---------|---------|
| X2                 | 136 | 5.00  | 29.00 | 16.7721 | 4.35459 |
| X3                 | 136 | 12.00 | 27.00 | 20.9779 | 3.29414 |
| X4                 | 136 | 5.00  | 29.00 | 16.4412 | 3.81569 |
| X5                 | 136 | 5.00  | 29.00 | 17.5882 | 4.86175 |
| Y                  | 136 | 27.00 | 46.00 | 37.0294 | 4.27732 |
| Valid N (listwise) | 136 |       |       |         |         |

From the Table 4.3, the average success achieved in public sector construction project (NDDC University Hostel project in UNIPORT) given the identified project delay factors is 37.0294. The study believe that this is low and warranted this study.

#### 4.2.1 Hypothesis Testing

The hypotheses formulated were tested using the t-test and correlation analysis at 5% level of significance and the result are as follows;

##### Hypothesis One

H<sub>01</sub>: Finance related delay factors do not have significant effect on the performance of public sector construction project delivery.

**Table 4.4 T-test Results**

|    | Test Value = 0 |     |                 |                 |   |         |
|----|----------------|-----|-----------------|-----------------|---|---------|
|    | t              | df  | Sig. (2-tailed) | Mean Difference | 95% Confidence Interval of the Difference |         |
|    |                |     |                 |                 | Lower                                     | Upper   |
| X1 | 52.060         | 135 | .000            | 17.77941        | 17.1040                                   | 18.4548 |
| X2 | 44.917         | 135 | .000            | 16.77206        | 16.0336                                   | 17.5105 |
| X3 | 70.726         | 135 | .000            | 19.97794        | 19.4193                                   | 20.5366 |
| X4 | 59.418         | 135 | .000            | 19.44118        | 18.7941                                   | 20.0883 |
| X5 | 42.189         | 135 | .000            | 17.58824        | 16.7638                                   | 18.4127 |
| X6 | 100.959        | 135 | .000            | 37.02941        | 36.3040                                   | 37.7548 |

The t-test result of the computer printout show that the t-calculated value of 52.060 imply that finance related factors (X<sub>1</sub>) are significant at 0.05.

##### Hypothesis Two

H<sub>02</sub>: Material related delay factors do not have significant effect on the budgeted cost and time of public sector construction project delivery.

From Table 4.4, a t-value of 44.917 is significant at 0.000 level of significance, implying that at 0.05 level of significance, the identified materials related delay factors (X<sub>2</sub>) are significant to the success of public sector construction projects in Port Harcourt.

##### Hypothesis Three

H<sub>03</sub>: Contractor related delay factors do not have significant effect on the performance of public sector construction project delivery.

The t-test result of the computer printout in Table 4.4 show that the t-calculated value of 70.726 imply that contractor related factors (X<sub>3</sub>) are significant at 0.05. This implies that contractor related delay factors significantly affected NDDC University Hostel construction project performance in UNIPORT.

##### Hypothesis Four



H<sub>04</sub>: The effect of equipment related delay factors on the delivery of public sector construction project is not significant to mar the project success.

From Table 4.4, a t-value of 59.418 is significant at 0.000 level of significance, implying that at 0.05 level of significance, the identified equipment related delay factors (X<sub>4</sub>) are significant to the success of public sector construction projects in UNIPORT, Rivers State.

#### Hypothesis Five

H<sub>05</sub>: Client related delay factor is not significant to affect the success of public sector construction projects.

The t-test result of the computer printout in Table 4.4 show that the t-calculated value of 42.189 imply that client related factors (X<sub>5</sub>) are significant at 0.05. This implies that clients related delay factors significantly affected NDDC University Hostel construction project performance in UNIPORT. Therefore we accept the alternative hypothesis and conclude that client related delay factor is significantly affected the success of public sector construction projects.

The test result reveal that all the identified delay factors show high level of significance to the performance of public sector construction projects in Port Harcourt, Rivers state. Contractor related factors mostly affected the performance of project of construction projects in Port Harcourt, Rivers State with respect to delay witnessed in the delivery of NDDC Hostel projects in UNIPORT. The client contributed least to the level of delay in the construction of the public sector NDDC Hostel projects in Port Harcourt, Rivers State.

#### 4.2.2 Ranking of the Factors

This was done using Relative Severity Index (RSI) technique.

**Table 4.5 Priority Ranking of the Identified Delay in Construction Projects**

| S/N | Delay Factors                        | Respondents' Score |        |        |        |         | Total | ΣW  | Mean | RSI  | Rank            |
|-----|--------------------------------------|--------------------|--------|--------|--------|---------|-------|-----|------|------|-----------------|
|     |                                      | HE<br>5            | E<br>4 | N<br>3 | I<br>2 | HI<br>1 |       |     |      |      |                 |
| 1   | Finance Related (X <sub>1</sub> )    | 37                 | 39     | 17     | 22     | 21      | 136   | 457 | 3.36 | 0.79 | 2 <sup>nd</sup> |
| 2   | Materials Related (X <sub>2</sub> )  | 39                 | 30     | 21     | 26     | 20      | 136   | 450 | 3.30 | 0.72 | 3 <sup>rd</sup> |
| 3   | Contractor Related (X <sub>3</sub> ) | 53                 | 32     | 12     | 19     | 20      | 136   | 487 | 3.58 | 0.83 | 1 <sup>st</sup> |
| 4   | Equipment Related (X <sub>4</sub> )  | 27                 | 22     | 11     | 36     | 39      | 136   | 367 | 2.69 | 0.56 | 5 <sup>th</sup> |
| 5   | Client Related (X <sub>5</sub> )     | 37                 | 11     | 18     | 31     | 39      | 136   | 384 | 2.82 | 0.60 | 4 <sup>th</sup> |

The priority ranking above show that contractor related delay factors contributed the most in the level of delay experienced in NDDC Prototype hostel construction project in UNIPORT, Rivers State. This is followed by finance related delay factors. The least delay factor that contributed to the level of delay experienced in the hostel project is the equipment related factors. The findings made here is consistent with the findings made in any part of the analysis in this study. This finding also depicts reality as the delay in this study were practically caused by the wrong activities of the first contractor (Messrs. Mosaf Nig. Ltd.)

#### 4.3 Result Discussions

From the above analysis the following can be deduced;

i. the activities of most construction project contractors causes a lot of delay in delivering projects to clients as planned. The mistake of the contractor in omitting some important aspect of the projects in the BOQ coupled with the delay in retrieving the mobilization fee from the first contractor (Mosaf) to the second contractor (Ferzinat) [see Table 4.1]. This result depicts reality as it reflects the true situation of most failed and abandoned projects across the Nigeria and other developing countries. Nwachukwu, Echeme&Okoli, (2010)

also commented similar result in the work on Project Management Factor Indexes; A Constraint to Project Implementation Success in the Construction Sector of a Developing Economy.

ii. the descriptive statistics show that the mean success achieved in public sector construction project (NDDC University Hostel project in UNIPORT) given the identified project delay factors is low and warranted this study ( see Table 4.2). There is no doubt that a project which suffered this high level cost and time overrun will not perform magic and be successful. The reason behind this abysmal performance were examined critically.

iii. The hypotheses testing show that all the identified variables are significantly effective and hence contributed in the delay which affected this NDDC hostel projects negatively. It also show that Contractor related factors contributed most to the low level of performance achieve in public sector construction projects, especially the NDDC hostel project, in Port Harcourt, Rivers state. The implication is that in an area like Port Harcourt, most contractors that exist there are not qualified and based on the prevalent corruption rate witnessed, any contractor can win contract in public sector. This is a canker worm in the survival of indigenous contractors in Nigeria.

iv. All the identified delay factors show high level of significance to the cost of public sector construction projects. Materials related factors mostly affected the cost of project materials use for construction projects in Port Harcourt, Rivers State (see Section 4.2.1: hypothesis II analysis). This implies that variables such as shortage of construction materials, poor procurement of construction materials, and escalation of material prices, unreliable suppliers and poor quality of construction materials collectively increased the cost of construction materials, hence increasing the contract sum of NDDC Prototype University Hostel projects in UNIPORT, Rivers state.

v. the ranking through Relative Severity Index (RSI) show that contractor related problem created a lot of delay witnessed in the execution of the NDDC hostel construction under investigation in UNIPORT, Rivers state. The least contributory factor is the equipment related factors. This depicts reality because when a contractor deliberately omitted costly and important work item from the BOQ, such project is deemed to have failed as there will eventually be delays at one point or the other. Most authors like Echeme and Nwachukwu, (2011) refer to this as the dilemma of the lowest bidder in tendering and the owners of a project should beware of it before awarding contract to the lowest bidder.

The researcher can therefore say that the findings made in this study had to a large extent empirically justified the call for effectiveness and honesty on the side of the Nigerian contractors to forestall construction project failure and abandonment.

The study believe that education for all in the 21<sup>st</sup> century will be realized if these findings are carefully considered and applied in planning and implementing projects in Rivers state and other neighboring states in the area. The study concludes with some recommendations on how to minimize construction project delay in Port Harcourt, Rivers State and improve the level of construction project implementation in Nigeria and Rivers state in particular.

## 5.0 CONCLUSION

Numerous factors are contributory to delay experienced in most public sector construction projects in Port Harcourt, Rivers state, Nigeria. These factors have significant effect and relationship on quality, time and cost variations witnessed during the planning and implementation of NDDC University Prototype Hostel construction project in University of Port Harcourt (UNIPORT), Rivers state. The general treatment of the related variables is enough evidence of thorough research to determine the influence of the identified factors causing construction delays in public sector project execution. Again, the knowledge of the varieties in the behaviour of these factors calls for concern and policy change as well as total reform of our construction industry for better executions that can translate into positive economic development.

Given these results, among others, one can conclude that activities of most contractors towards public sector construction projects cannot help economy to grow. Government and private contractors need a sound rethink towards their ugly activities which has frustrated and is still frustrating the efforts of the Government at all

level in developing all sectors of the economy for national development. It is obvious that government cannot achieve this noble objective without the positive contribution of the construction industry. Based on the findings of this study, construction project contractors should readjust and be honest in dealing with the public and private clients in order to avoid possible delays which can negatively affect the project cost and quality. The government on the other hand should restructure the economy to be economically stable as this will help minimize unnecessary fluctuation in the prices of construction materials. Timely and adequate funding is also necessary to enable contractors to implement and complete construction projects successfully, especially in Rivers state.

Based on our finding and conclusions for the study, the following recommendations which involved public sector construction project delays, and their causative factors, were made;

Generally, public or government contractors should study and articulate all the project activities and their related costs before submitting their quotations. This will help in minimizing omission of any construction project item and ensure accurate estimation of construction project costs.

The study also advocate efficient and effective tendering process. This will be made possible by making a thorough in-house examination of the tenders before awarding contracts. NDDC and other related government agencies should do away with corruption and approach rendering with utmost honesty in order to select effective contractor who will be able to honor contract terms and deliver projects successfully.

Government should also intensify efforts to ensure stability in the market prices of construction materials. This will enable contractors manage the project funds released to them without attempting to cut corners which may compromise the quality of the project, if eventually completed. This can be achieved by looking at ways of minimizing the cost of factor inputs (materials, labour, etc.).

More so, contractors should pay more attention to detailed design of project for accurate estimation of cost and time to avoid or minimize the incidence of public sector construction projects in Rivers state and its environment.

Lastly, for enhanced economic growth and national development, construction projects must be successfully planned and implemented. For this to happen, there is urgent need for honesty and transparency among the players in the public sector or government agencies and construction industry.

If all the findings and recommendations made in this study is considered, there will be enhanced delivery of public and private construction projects which will trigger rapid economic development by eradicating waste (costs) incurred whenever projects fail or abandoned. This costs can be channeled into other economic development activity.

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