

# Investigating Nigerian Indigenous Contractors Project Planning In Construction Procurement: An Explanatory Approach

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**Abstract--** This study investigated Nigerian indigenous contractors (NICs) involvement, performance, project planning challenges and application of project planning techniques in building project procurement systems in Nigeria. Explanatory method was used through a collective case study of building projects files. Fifteen contractors were evenly selected from a population of 69 NICs in the three geo-political zones of northern Nigeria through a Stratified random sampling technique. The documents for the case study satisfies the external and internal criticism techniques test for validity and reliability. Bloom's hierarchy taxonomy and descriptive statistics was used to analyse data. Result reveals that NICs: are involved in both traditional and non-traditional procurement systems and their frequency of involvement is lower in the non-traditional procurement systems, underperformed in project cost and time, experience project planning challenges, and inappropriately apply project planning techniques in project procurement systems in Nigeria. This study recommends NICs to employ competent personnel, embark on continuous training, adopt project management methodology; projects clients and consultants should adhere to project management procedures; and the standard form of contract used in Nigeria should be reviewed to include a clause enforcing contractors to apply the appropriate planning techniques. Adherence to the recommendations will enhance the NICs project management performance to meet construction best practice.

**Index Term--** Indigenous contractors, Nigeria, Performance, Procurement systems, Project planning

## 1.0 INTRODUCTION

Idoro (2014) affirmed that construction is the bedrock of development and no country can think, dream and experience development without an efficient and effective construction industry. Alzahrani and Emsley (2013), and Yimam (2011) asserted that construction projects and their success are highly dependent on contractors. Hence, contractors' role in the construction industry cannot be overemphasized; their competence and capability is a function of performance and output in the construction industry (Odeiran, *et al.* 2012;

Yimam, 2011). Construction contractors are entrepreneurs involved in the management of construction projects (Inuwa *et al.* 2013; Harris & McCaffer, 2005; Bennett, 2003). Their role in the management of modern construction projects is circumscribed within design and management decisions, direct physical production of the facility on site, project close-out/final accounting, and rehabilitation and maintenance of existing facilities (Windapo, 2013; Babatunde *et al.* 2010; Oyegoke, 2006; Rashid *et al.* 2006; Harris & McCaffer, 2005). Construction Contracting is a high risk business that entails a complex interplay of client, consultants, contractors, tools, equipment's and materials (Windapo, 2013; Seeley, 1986, p.254). Consequently, it is a terrain that calls for high specialization (Muazu & Bustani, 2004). Therefore, it is practically impossible to diligently run a construction firm without the requisite project management knowledge (Freeman, 2011). Hence, contractors require project management techniques to successfully accomplish their construction project tasks (Passenheim, 2009; Baily, *et al.*, 2008; Gollenbeck, 2008).

According to Passenheim (2009) planning is a fundamental tool in project management used in meeting project scope, time and cost. Planning defines the activities and actions, time and cost targets, and performance milestones which will result in successful project objectives (Teslang, 2004 in Ubani, *et al.*, 2010). In the developed countries, contractors have embraced planning because the results of a well-planned, carefully monitored and controlled contract directly impact on performance and profitability of the contract and the company (Harris & McCaffer; 2005). However, most NICs are frequently criticized for poor performance due to management incapacity and their inability to plan projects adequately according to contractual requirements (Oladimeji & Ojo, 2012; Aniekwu & Audu, 2010; Muazu & Bustani, 2004; Saleh, 2004; Achuenu, *et al.*, 2000). This prevents the Nigerian construction industry (NCI) from meeting the construction needs of the nation (Aniekwu & Audu, 2010; Saleh, 2004; Achuenu *et al.* 2000).

## 2.0 NICs PROJECT MANAGEMENT PERFORMANCE IN BUILDING PROCUREMENT SYSTEMS

The debate on project performance in NCI centres mainly on the performances of foreign and indigenous contractors (Idoro & Akande-Subar, 2008). Indigenous contractors are contracting firms that are fully-owned and managed by Nigerians; the nationality of the firms' ownership and management is exclusively Nigerian. Uduak (2006) and Y. Ibrahim (2012) scored the performance of Nigeria indigenous contractors' better in building and civil engineering projects and claimed that they can be entrusted with large and highly technical projects. While most studies reported that their performance is frequently associated with poor management resulting in poor planning, poor goal commitment, poor team motivation, poor technical competence, poor scope and work definition and poor project control system (Aniekwu & Audu, 2010; Bala *et al.* 2009; Muazu & Bustani, 2004; Saleh, 2004; Achuen, *et al.* 2000; Adams, 1997).

Construction procurement systems are broadly classified into traditional and non-traditional (for detail see: Mathonsi & Thwala, 2012; Babatunde *et al.* 2010; Harris & McCaffer, 2005). Several studies has shown that both traditional and non-traditional procurement methods are currently embraced in the procurement of building projects in Nigeria (Idoro, 2012b; Ikediashi, *et al.* 2010; Babatunde *et al.* 2010; A.D Ibrahim, 2008; Ojo, *et al.* 2006), and that most of the projects underperformed in terms of cost and time (Idoro, 2012b; Ikediashi, *et al.* 2010; Ojo, *et al.* 2006). According to Idoro (2012b), and Aniekwu and Audu (2010) this could be attributed among other things to weak institutions, poor practices and policies, and ineffective and inefficient planning. Idoro (2012b) stressed that research studies reveal that planning has a considerable effect on the outcome of projects. This is a point of concern to NCI because for any construction industry of any country to contribute to economic growth, it requires human resource that has the ability to compete globally (Mbamali & Okotie, 2012; Odediran *et al.*, 2012; Aniekwu & Audu, 2010). Unfortunately, none of these studies were directly conducted to investigate NICs involvement, performance (time and cost), and application of planning techniques in building projects procurement systems in Nigeria.

## 3.0 STATEMENT OF THE PROBLEM

Numerous problems confronting the NCI coupled with the inability of the NICs to provide the enabling environment for sustainable development and the requisite potentials to address the challenges of globalization, have remained a serious concern to all in the Nigerian economy (Idoro, 2014; Mbamali & Okotie, 2012; Odediran, *et al.*, 2012; Aniekwu & Audu, 2010). Hence, the NICs are frequently criticized by clients' and other stakeholders for poor project performance (Aniekwu & Audu, 2010; Idoro & Akande-Subar, 2008; Saleh, 2004). Their performances are replete with: abandonment of projects, cost and time overruns, poor workmanship, poor management capability, financial difficulties, poor planning, poor

mechanization, and high frequency of litigation (Odediran, *et al.*, 2012; Oladimeji & Ojo, 2012; Aniekwu & Audu, 2010; Muazu & Bustani, 2004; Achuen, *et al.*, 2000; Adams, 1997).

Consequences of these under performances has contributed to the inability of the NCI to deliver services effectively and efficiently, hence the industry is routinely accused of being wasteful, inefficient, and unsafe, falling short of quality and quantity targets, and being late in delivery (Ibrahim & Musa-Haddary, 2010; Omole, 2001). Moreover, construction projects in Nigeria cost more than similar ones in other parts of the world (Nasiru, *et al.*, 2012; Quantity Surveyors Registration Board of Nigeria-QSRBN, 2012). According to QSRBN (2012) and Ubani, *et al.* (2010) high cost, time overruns, slipped milestone of projects experienced in Nigeria, impact negatively on the development of the nation's economy. These amongst other factors have made the NCI unable to address the huge deficit of basic amenities, essential public infrastructure, and population pressure on the urban centres', resulting in 60% of urban inhabitants in desperate need of housing (Dahiru & Mohammed, 2012; Oni & Wyk, 2012; Ibrahim A.D. & Musa-Haddary, 2010). Thus making the attainment of the country's ambition envisioned in the Millennium Development Goals (MDG) target of 2015 and the vision 20:2020 doubtful (Dahiru & Mohammed, 2012; Oni & Wyk, 2012). Consequent to the inefficiency of the NICs, foreign contractors dominate 95% of the major public projects in the country (Odediran *et al.*, 2012; Aniekwu & Audu, 2010; Oladapo, 2006; Muazu & Bustani, 2004). The outcome to the NCI and the economy are: low income generation and redistribution due to expatriates repatriating their profit abroad, inexperience indigenous contractors, an insignificant value added to construction and local industries supplying construction materials, and consistent contribution of 1% employment over the last decade as against the World Bank's average observation of about 3.2% in other developing countries (Odediran, *et al.*, 2012; Aniekwu & Audu, 2010; Idrus & Sodangi, 2010; Bala, *et al.*, 2009; Jinadu, 2007; Muazu & Bustani, 2004; Adams, 1997).

Many researchers have attributed the underperformance of NICs to poor project planning due to: non-adoption of project management techniques, incompetence and inexperience, inefficient policies and practices, weak institutions and adverse business environment, and complex social and cultural practices (Odediran, *et al.*, 2012; Aniekwu & Audu, 2010; Bala, *et al.*, 2009; Muazu & Bustani, 2004; Achuen, *et al.*, 2000; Adams, 1997). Contractor's planning capability and procurement methods according to Azhar, *et al.* (2008), are part of the qualitative significant factors affecting project procurement performance, hence, it needs adequate attention. This becomes necessary because there is an element of entrepreneurial risk associated with the assignment of procurement tasks due to lack of understanding and implementation of factors to achieve results from work performed by others (Anyadike, 2000). Underperformance of the NICs is perhaps due to inexperience, incompetence,

project planning challenges, and inappropriate application of project planning techniques. To ensure project success, project management techniques and tools should be effectively utilized (Nicholas & Paul, 2010; Gollenbeck, 2008; Ireland, 2006). Hence, adequate planning is required to precede the execution of all other managerial functions/operations in project management (Krishnamurthy & Ravindra, 2010; Kerzner, 2000). The study therefore aims at investigating NICs: involvement, project performance (time and cost), project planning challenges, and planning techniques application in project operational planning in building projects procurement systems in Nigeria.

#### 4.0 RESEARCH METHODOLOGY

This study is part of an ongoing Ph.D. research work and was used as a probe on the questionnaire responses in the main work (not part of this work). This study use explanatory method through a collective case study of completed building projects files. The projects studied were executed between 2003 and 2013. According to McNabb (2009) a collective case study approach is used to study a group of similar cases in order to study a particular phenomenon. The design is also used to suggest whether a characteristics might be common to larger population of similar cases. The cases selected may be chosen because they are similar or because they are different (McNabb, 2009). This study adopted the collective case study approach because it is studying a group of NICs and wants to ascertain the activities and actions of NICs projects planning and management in Nigeria. Data generated from such source (documentary; historic) according to Buys (2004), are primary data that contains fact about individuals, organizational behaviours written in records or accounts of past happenings and events. The study targeted medium and large indigenous contractors in the northern geo-political zones of Nigeria. The zones constitute 3 of the 6 geo-political zones of Nigeria (North-central, north-east and north-west), and slightly more than half of Nigeria's 36 states and its Capital (19 states and Abuja), representing almost 80% (744,249.08 sq. km) of Nigeria's total land size (NPC, 2010). It has a population of over 75 million people, representing 54% of Nigeria's total population (NPC, 2010).

According to Guthrie (2010) a case study can be used to generalize on a study population if the sample of the cases are systematically chosen. This Guthrie (2010) emphasized, will provides a high probability for the outcome of a case study to exemplify its population pattern. The sample size for the case study therefore, was systematically obtained through a stratified random sampling technique on a population size of 69 NICs in order to enable its generalization on the study population. A total of fifteen (15) contractors were selected; five each from the cities of Abuja, Bauchi/Gombe (two cities merged) and Kano respectively. These cities are located in the north-central, north-eastern and north-western geopolitical zones of Nigeria respectively. These cities has the highest

concentration of construction activities and contractors in their respective zones (Usman, *et al.*, 2012; Ameh & Odusami, 2010).

The validity and reliability of the documents (projects files) used for the case study was tested using the external and internal criticism techniques (Guthrie, 2010). The external criticism technique is a validity test concern with ascertaining the genuineness of a data from a source (Guthrie, 2010). To ensure the genuineness of the data obtained from the clients' custody, all the materials used as a source of data for the research case study bears (Guthrie, 2010): letter heads, titles, file numbers, official stamps, dates, and official signatures. While the internal criticism technique is a reliability test concern with the meaning of a documentary data; whether it present the full picture and whether there is a balance view (Guthrie, 2010). This test was satisfied by the study; all the projects files used for the study were in the custody of the clients representing all correspondence of the parties involved during the execution of the building contracts. The data from the project files were analysed using Bloom's taxonomy hierarchy and descriptive statistics; frequencies and percentages. The Bloom's taxonomy hierarchy prescribe that data obtained should (Guthrie, 2010): first, be describe; then analyse (classify); and draw conclusions or interpret. In describing the data, the study write out the facts the way it is, in clear descriptive reporting, free of adjectival colour and filter out those matter which are not relevant to the research problem (Guthrie, 2010).

#### 5.0 CASE STUDY DATA ANALYSIS

This section conveys information concerning the collective case study data: presentation, analysis, and interpretation. Table 1 present a detailed breakdown of the data presentation, analysis and interpretation of the collective case study. A total of 15 cases where studied (CS01-CS15).

##### 5.1 CS01: Hospital building

CS01 is a hospital building procured by a public client through the *design-bid-build* method (DBB), using JCT form of contract. It was contracted at an initial cost (contract sum) of ₦248, 618,816.25, and expected to be completed in 6½ months. The building was however completed at a cost of ₦421, 041,104, in a duration of 30 months. The contract recorded a cost and time overruns of 69.35% (₦172, 422,288) and 361.54% (23½ months) respectively. Documentary evidence attributed the cost and time overrun to late honouring of payment certificates, and variations emanating from the project consultants' and the client's due to: change in specification, additional hospital wards and consulting rooms, and omitted items in the BOQ. The main contractor for the project used Bar Chart but later discarded it, because it became invalid. The work was done based on money provided by the client. The contractor did not use any computer software/application package for planning the project.

### 5.2 CS02: Administrative block building

CS02 is an administrative office building (3-storey) located in Abuja procured by a public client through the DBB method, using ministry of housing condition of contract (lump sum with quantities). It was awarded in 2003 at an initial cost of ₦282,560,190 and expected to be executed within 54 months. The building was however completed in 117 months, at a final cost of ₦712,874,024. Delay of interim payments and the conversion of car parks to offices, increased the contract sum and duration. This resulted in a cost and time overrun of 152.29% (₦430,313,834) and 117% (63 months) respectively. The only planning tool used by the contractor was bar chart, and no evidence of applying computer software/application package for planning the project.

### 5.3 CS03: Mega shopping plaza

CS03 is a mega shopping plaza (3-storey) procured through design-build (DB) method, by a private client, using JCT condition of contract. It is located in Abuja and contracted in 2003. The structure was completed in 21 months, at a cost of ₦680,015,245, as against an initial duration and cost of 14 months and ₦572,350,095 respectively. The initial estimated cost and time, overrun by 18.81% (₦107,665,150) and 50% (7 months) respectively. Documents studied reveals that the cost and time overrun is as a result of delayed payments and variation emanating from expansion and alteration of initial design, which eventually necessitated structural details adjustments. A completed staircase and a hall were altered resulting in a rework. The only planning tool used by the contractor was bar chart, and no evidence of applying computer software/application package for planning the project.

### 5.4 CS04: Administrative block

CS04 is an administrative block building (2-storey) located in Abuja, contracted in 2005 by a public client, through a DBB method, using JCT contract condition (awarded as fluctuation price contract). The structure was built within 28 months at a final cost of ₦297,787,635. It was initially estimated to cost ₦249,109,900, and to be built in 15 months. The differences in cost and time, was 19.30% (₦48,677,735) and 86.67% (13 months) respectively. The causes of the cost and time overrun as gathered from the project file emanates from: poor feasibility study, delay in payments, fluctuation in prices of materials and labour, and design inadequacies. The proposed location of the structure was changed to another location 25 kilometre (km) away from the initial location after it has been contracted. The change of location increases the cost of labour and materials due to an increase in transportation. Progress of work was smooth in the first 5 months of the contract. Afterwards, work stopped on site due to non-honouring of payment certificates; only one payment out of five, was honoured in the entire 5 months period. This resulted in the contractor abandoning work for 10 months. Amendment of a structural design error took the structural engineer a lot of time to address. This also contributed to delay in the project progress of work. These delays resulted in a fluctuation in materials and labour prices in the sum of ₦12,696,164, and

loss and expenses on running preliminaries amounting to ₦1,840,800. Other variations in the contract cost ₦34,140,771. The only planning tool used by the contractor was bar chart, and no evidence of applying computer software/application package for planning the project.

### 5.5 CS05: Shops & offices

CS05 is a private owned 3-storey shops and offices building procured through DB method. It was contracted in 2009 using the JCT form of contract (fixed sum; no fluctuation claims is to be entertained from the contractor). The contractor was paid 15% mobilization fee before the commencement of work. Yet, the contract overran its initial estimated cost and time by 44.15% (₦10,341,485) and 50% (2 ½ months) respectively. The initial estimated contract sum and duration was ₦23,423,325 and 5 months respectively. Variations from the client call for the adjustment of the structural details, costing ₦1,749,440, and resulted in delay also. The contractor's fluctuation claim in the sum of ₦8,592,045 for increase in prices of materials and labour was accepted. Consequently, shoot up the initial cost and duration to ₦33,764,810 and 7 ½ months respectively. Bar chart was the only evidence of planning tool used for the project. No computer software/application package used in planning the project by the contractor.

### 5.6 CS06: Lecture hall

CS06 is a 2-storey lecture hall located in Bauchi/Gombe contracted in 2011 by public client using Education Trust Fund (ETF) condition of contract. The award was at the cost of ₦47,193,052, and expected to be executed in 7 ½ months. Documentary evidence reveals that the contract experienced delays both from the contractor and the client. There was a delay in payments and in the contractor's work and supply of materials. Variation from the client resulted in a cost overrun of 21.19% (₦10,000,000). Hence, the duration of the contract was extended to 16 months (113.33%). Bar chart was the only evidence of planning tool used for the project. No computer software/application package was use in planning the project by the contractor.

### 5.7 CS07: Office block

CS07 is a public institution office block building located in Bauchi/Gombe and contracted in 2007. The building was procured through DBB method, using the ETF condition of contract. Documentary study shows that the contract was awarded at a sum of ₦13,050,430 and for a duration of 3 months. The contractor for the job was paid 25% advance payment prior to commencement of work. Thereafter, there was a delay due to the Government bureaucratic process in confirming the contractor's competence and integrity. The delay caused by the Government was used to claim for material fluctuation amounting to ₦1,773,405. The client in-house consultant issued 16 number variation orders in the course of the project. The reasons for the variation as gathered from the project file was as a result of poor feasibility study and design inadequacies. These contributed to an increased in the contract sum by ₦481,190. The contract was finally

completed at a cost of ₦15,305,025, in 21 months, reflecting 17.32% (₦2,254,595) and 600% (17 months) increase in the contract sum and duration respectively. Bar chart was used by the contractor for planning the project. No computer software/application package was used in planning the project by the contractor.

#### 5.8 CS08: Classroom block

CS08 is a classroom block procured by a public client located in Bauchi/Gombe and contracted in 2005. The project for the building was contracted at a cost of ₦23,680,260, for duration of 4 months, using ETF condition of contract. It was however completed at a cost of ₦31,968,351, in a duration of 8 months. The contract recorded 35% (₦8,288,091) and 50% (4 months) cost and time overrun respectively. Variations and delay in payments resulted in the differences in cost and time. No planning tool was used by the contractor to plan the project.

#### 5.9 CS09: Classroom and Residential building

CS09 is the renovation of existing classrooms, building of new classrooms and residential buildings in Bauchi/Gombe. It is a state government contract, awarded in 2010, using the state government contract agreement (inclusive of conditions) to a single contractor. The contract was a fixed sum contract subject to variation from the client, under the DBB method. The initial contract sum was ₦190,052,787, for duration of 15 months. The contractor was advanced 50% payment prior to commencement of work. The initial contract sum and duration overran by 18.94% (₦36,000,000) and 50% (7 months) respectively.

Documentary evidence indicated that the cause of the overruns were: additional payments of ₦28,000,000 recommended by the client in-house consultants for additional works not explicitly stated and backed by documents; and an observation raised by the contractor for work items omitted in the BOQ and a fluctuation claim for increase in prices of materials and labour, to a turn of ₦8,000,000. These resulted in a final contract sum and duration of ₦226,052,787.68 and 21 ½ months respectively. No planning tool was used by the contractor to plan the project.

#### 5.10 CS10: Residential building

CS10 is a 3-bedroom residential apartment procured through the traditional method (DBB) by a public client in Bauchi/Gombe. It was contracted in 2010 on a fixed sum basis, subject to variation from the client, using the state government condition of contract. The project files studied reveals that the contractor was paid 50% in advance prior to commencement of work. However, the contract was eventually completed at a cost of ₦21,850,000, in a duration of 5 months, as against its initial estimated cost and duration of ₦18,215,052 and 2 months respectively. This translates to a difference in cost and duration of 19.92% (₦3,634,948) and 150% (3 months). Causes of the difference in cost and time respectively, as deduced from contract correspondence pointed to: bureaucratic hiccups, delay in honouring payments and delay in the contractor's operations. No evidenced of planning tool (s) used by the contractor for planning the project.

#### 5.11 CS11: Library extension

CS11 is a contract for extending a library building (1-storey), procured by a public institution through the DBB method in Kano. The contract was a fixed fee contract, using the JCT condition of contract. The contractor was paid an advanced of 30%, prior to commencement of work. The job was finally completed at the initial estimated cost of ₦87,124,454, recording a 0% cost overrun.

However, the duration of the contract over shoot its initial estimated duration of 9 months by 55.56% (5 months). Causes of duration extension as evident from the contract correspondence are: delay in payments; and an instruction from the project architect to the contractor for the removal and reconstruction of 8 number work items (rework), due to the usage of sub-standard materials and poor workmanship. Bar chart was the only planning tool used for planning the project programme of work.

Table I  
Case Study Data Presentation

| Cases        | Type of building         | Year      | Location     | Client's | Procurement Type | Cost (Nigerian Naira; ₦) (000,000) |             | Cost overrun % | Time overrun (months) |            | Time overrun % | Planning tool (s) used |
|--------------|--------------------------|-----------|--------------|----------|------------------|------------------------------------|-------------|----------------|-----------------------|------------|----------------|------------------------|
|              |                          |           |              |          |                  | E                                  | F           |                | E                     | F          |                |                        |
| CS01         | Hospital                 | 2009-2012 | Abuja        | Public   | DBB              | 249                                | 421         | 69             | 7                     | 30         | 362            | Bar chart              |
| CS02         | Administrative block     | 2003-2012 | Abuja        | Public   | DBB              | 283                                | 713         | 152            | 54                    | 117        | 117            | Bar chart              |
| CS03         | Mega shopping plaza      | 2008-2010 | Abuja        | Private  | DB               | 572                                | 680         | 19             | 14                    | 21         | 50             | Bar chart              |
| CS04         | Administrative block     | 2005-2009 | Abuja        | Public   | DBB              | 249                                | 298         | 19             | 15                    | 28         | 87             | Bar chart              |
| CS05         | Shops & offices          | 2009-2010 | Abuja        | Private  | DB               | 23                                 | 34          | 44             | 5                     | 8          | 50             | Bar chart              |
| CS06         | Lecture hall             | 2011-2013 | Bauchi/Gombe | Public   | DBB              | 47                                 | 57          | 21             | 8                     | 16         | 113            | Bar chart              |
| CS07         | Office blocks            | 2007-2009 | Bauchi/Gombe | Public   | DBB              | 13                                 | 15          | 17             | 3                     | 21         | 600            | Bar chart              |
| CS08         | Classroom blocks         | 2005-2006 | Bauchi/Gombe | Public   | DBB              | 24                                 | 32          | 35             | 5                     | 9          | 89             | Non used               |
| CS09         | Classrooms & Residential | 2010-2011 | Bauchi/Gombe | Public   | DBB              | 190                                | 227         | 19             | 15                    | 23         | 50             | Non used               |
| CS10         | Residential              | 2010      | Bauchi/Gombe | Public   | DBB              | 18                                 | 22          | 20             | 2                     | 5          | 150            | Non used               |
| CS11         | Library extension        | 2006-2007 | Kano         | Public   | DBB              | 87                                 | 87          | 00             | 9                     | 14         | 56             | Bar chart              |
| CS12         | Lecture theatre          | 2003-2004 | Kano         | Public   | DBB              | 88                                 | 115         | 31             | 14                    | 20         | 43             | Bar chart              |
| CS13         | Offices/classrooms       | 2005-2006 | Kano         | Public   | DBB              | 163                                | 170         | 5              | 9                     | 11         | 24             | Bar chart              |
| CS14         | Residential              | 2004-2005 | Kano         | Private  | DB               | 10                                 | 15          | 46             | 8                     | 15         | 81             | Non used               |
| CS15         | Shops & offices          | 2010-2011 | Kano         | Private  | DBB              | 20                                 | 27          | 37             | 10                    | 18         | 74             | Non used               |
| <b>TOTAL</b> |                          |           |              |          |                  | <b>2036</b>                        | <b>2912</b> | <b>43</b>      | <b>176</b>            | <b>352</b> | <b>101</b>     |                        |

Note: E- estimation; F-final; DBB-design-bid-build; DB-design-build; Naira (₦)-Nigerian currency: US\$1= ₦ 160; all numerical entries are rounded to the nearest whole number.

Source: Field survey (2013)

### 5.12 CS12: Lecture theatre

CS12 is a 1000 capacity lecture theatre, with integrated offices, procured by a public client through the DBB method, using the JCT contract condition. It was contracted at a sum of ₦87, 772,643, and to be executed in 14 months. However, it was completed in 20 months and at a cost of ₦114, 804,671. It record a cost and time overrun of 30.8% (₦27, 032,028) and 42.86% (6 months) respectively.

The differences in cost and time emanates from poor feasibility study, variations and fluctuations. Inadequacy of aggregates at and within the domain of the contract, compel the contractor to source for it from a neighbouring state 200 km away from the site. Thirteen (13) number variations were introduced by the consultants, mostly due to design inadequacies. There was a revision in electrical services drawing. There was also inadequate information on the theatre's furniture which form part of the main contractor's work. Poor soil test resulted in an excess of 80% excavation in rock, which was not anticipated. There was delay in payments (2-4 months delays). All these brought about delays and fluctuation in prices of materials and labour. These compel the contractor to ask for an extension of 6 months. The only planning tool used for developing the contractor's programme of work was bar chart.

### 5.13 CS13: Offices and classrooms block

CS13 is a 3-storey office and classroom block building, procured by a public client, through the DBB method, using the JCT condition of contract. The contract record a cost and time overrun of 4.6% (₦7, 430,035) and 23.53% (2 months). Against an initial estimated cost and time of ₦163, 011,157.70 and 8 ½ months respectively. The differences in cost and time are as a result of variations due to inadequacies in architectural and structural design. This resulted in delay in the progress of work on site. The contractor therefore requested for an extension of time and additional payment. The contractor used only bar chart to plan his programme of work.

### 5.14 CS14: Residential building

CS14 is a 3-bedroom residential building procured by a private client, using the DB method. The contract was awarded at a sum of ₦10, 000,000 and to be completed in 8 months. However, the final cost and time shoot to ₦14, 630,000 and 14½ months respectively. Recording a cost and time overrun of 46.3% (₦4, 630,000) and 81.25% (6½ months) respectively. This was a result of variations, delays in payments and fluctuation of prices. The contractor did not use any planning tool for planning its programme of work.

### 5.15 CS15: Shops and offices

CS15 is a 1-storey block building for shops and offices, own by a private client. The contract used the DB method for the project. The contract was awarded at a sum of ₦20, 000,000 and expected to be completed in 9 months. The project was however completed at a sum of ₦27, 360, 000 and in a period of 16 months. The project recorded a cost and time overrun of 36.8% (₦7, 360,000) and 73.68% (7 months) respectively. Causes of differences in cost and time were variations, delays

in payments and fluctuation of prices. No any planning tool was used and no programme of work for the work.

## 6.0 DOCUMENTARY CASE STUDY INTERPRETATION

The following are detail interpretation of the documentary case studies conducted on 15 number projects executed within a period 10 years (2003-2013).

### 6.1 NICs Building Projects Procurement

#### Systems Involvements

NICs were involved in both traditional and non-traditional procurement methods. The major clients were public (73.33%). Majority of the procurement type used was DBB (89%). Most of the projects procured (80%) by public clients were through the DBB method. While, 67% of the projects procured by private clients were through the DB methods. NICs are not involved in other types of non-traditional procurement systems. NICs are more involved in the traditional method than the non-traditional methods. This shows that the NICs frequency of involvement in building projects procurement systems is much lower in the non-traditional methods. Hence, reveals their inexperience in the non-traditional methods.

### 6.2 NICs Project performance (Cost and Time)

All the projects (100%) record time overrun rates ranging from 23.53-361.54% and 50-81% in the DBB and DB methods respectively. Virtually all the projects (93%) experienced cost overruns. Their rate ranges from 4.6-152% and 5-21% for DBB and DB respectively. This result reveals that the NICs project management performance records high rate of time and cost overruns in building project procurement systems.

### 6.3 NICs Projects Planning Challenges

The NICs' experience project planning challenges as a result of: late honouring of payment certificates, too many variations, design inadequacies, delays, design inadequacies, incompetence, poor contract administration, and changes in prices of materials and labour. This result reveals that the NICs project planning challenges emanates from the clients, consultants, and the contractors themselves.

### 6.4 NICs Application of Project Planning Techniques

Virtually sixty seven percent (66.67%) of the contractors used only bar charts in planning their projects operations, while 33.33% of the contractors did not use any planning tool. None of the contractors apply computer software/application package in planning their projects operations. This reveals that some of the NICs do not apply planning techniques, and most of those who do; apply it inappropriately. Several authors admitted that bar chart is only suitable for activity scheduling and trending, but not appropriate for planning building projects, except when used as a complement to critical path method (CPM) (Bhavikatti, 2012; Krishnamurthy & Ravindra, 2010; Passenheim, 2009; Abubakar, *et al.*,2008; Bailey, *et al.*, 2008; Scott, 1995; Seeley, 1986). The NICs do not apply ICT in their project planning. The planning and management of modern construction projects generates a lot of information

that need the ICT to ensure it success (Inuwa, *et al.*, 2013; Roberts & Wallace, 2004; Kerzner, 2000). This result reveals that the NICs inappropriately apply planning techniques.

#### 7.0 DISCUSSION OF RESULTS

This study findings revealed that the NICs are involved in both traditional and non-traditional procurement systems by both the public and private clients. This result agrees with the findings of Mbamali & Okotie (2012), Idoro (2012b), Ikediashi, *et al.* (2010), Babatunde *et al.* (2010), A.D Ibrahim (2008), and Ojo, *et al.* (2006) that both traditional and the non-traditional procurement methods are currently embraced in the NCI. However, the NICs frequency of involvement in the non-traditional procurement method is much lower than in the traditional method, hence depicting their inexperience in the management of non-traditional procurement methods. The result also implies that if the NICs are to remain relevant and attract more patronage from the construction industry and competes globally, they need to understand and perfect how to plan their projects vis-à-vis their role in the non-traditional building procurement systems. This is because globally (Nigeria inclusive) public sector are encouraging and promoting active private sector involvement in the provision of public infrastructure and services due to: dwindling public resources competing for alternative uses; the global shift toward scaling back the size of governments through policies of deregulation and privatization; and a natural quest for more efficient and sustainable systems and structures for provision of public services and a need to supplant the largely bureaucratic public sector led regime (Ibrahim A.D. & Musa-Haddary, 2010; Omagbitse, 2010). The implication is that public clients will in future surrender being the major client of the industry to the private clients, and the private clients method of procuring projects is mostly through non-traditionally procurement systems (Ibrahim A.D. & Musa-Haddary, *et al.*, 2010; Omagbitse, 2010; Ojo *et al.*, 2006). Hence, contractor need to develop project management skill because, project management is a management discipline that is applied to all type of building projects procurement systems to attain project success (Ekundayo, *et al.*, 2013; Harris & McCaffer, 2005).

This study result also reveals that the NICs experience time and cost overruns in both traditional and non-traditional procurement systems. This result also confirms the findings from earlier studies by Idoro (2012b), Ikediashi, *et al.* (2010), and Ojo, *et al.* (2006) that both traditional and non-traditional procurement systems in the NCI experience time and cost overruns. This study findings also reveals that NICs experience project planning challenges emanating from the clients, consultants and contractors themselves, this is in agreement with the findings of Inuwa, *et al.* (2014) that NICs experience project planning challenges emanating from clients, consultants and contractors themselves. This study also revealed that some NICs do not apply project planning techniques, and most of the NICs that do, apply it inappropriately. In addition, the NICs do not apply ICT in planning their projects. The application of bar chart by most of

NICs in project planning is in conflict with the recommendation of several authors (Bhavikatti, 2012; Krishnamurthy & Ravindra, 2010; Passenheim, 2009; Abubakar, *et al.*, 2008; Bailey, *et al.*, 2008; Harris & McCaffer, 2005; Roberts & Wallace, 2004; Scott, 1995; Gahlot & Dhir, 1992; Seeley, 1986) that bar chart cannot be use alone as a planning technique for building projects, except in combination with CPM. This result confirms that most NICs are incompetent and unable to plan projects as required by their contractual obligation (Odediran, *et al.*, 2012; Aniekwu & Audu, 2010; Bala, *et al.*, 2009; Muazu & Bustani, 2004; Saleh, 2004; Achuenu, *et al.*, 2000; Adams, 1997). The poor project planning of NICs is compounded by the inability of the conditions of contracts for building projects use in the NCI in specifying to contractors' what type of planning technique to use for their master programme (FMHUD, 2006; JCT, 2005a; JCT, 2005b; Scott, 1995).

#### 8.0 CONCLUSION AND RECOMMENDATION

This study used an explanatory method through a collective case study of completed building projects files in northern Nigeria to investigate NICs: involvement, project performance (time and cost), project planning challenges, and application of project planning techniques in building projects procurement systems in Nigeria. This was informed by the inability of NICs to plan projects according to its contractual requirements and the absence of studies on the investigation of NICs involvement, time and cost performance, project planning challenges, and application of project planning techniques in building projects procurement systems in Nigeria. This study was able to reveal that NICs are involved in both traditional and non-traditional procurement systems and their frequency of involvement is much lower in the non-traditional procurement methods. It also reveal that the NICs underperformed in project cost and time, experience project planning challenges, and inappropriately apply project planning techniques in building projects procurement systems in Nigeria.

This study recommends NICs to employ competent personnel, embark on continuous training and adopt project management methodology in the management and planning of construction projects; projects clients and consultants should adhere to project management procedures; and the standard form of contract used in Nigeria should be reviewed to include a clause enforcing contractors to apply the appropriate project planning techniques. Adherence to the study recommendations will enhance the NICs project management performance to meet construction best practice.

This study was delimited to the northern geopolitical zones of Nigeria. Further study can be conducted in the south, west and eastern zones of Nigeria to investigate NICs involvement, project performance (time and cost), project planning challenges, and application of project planning techniques.

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