EXAMINATION OF THE FACTORS AFFECTING COST OF CONSTRUCTION PROJECTS DELIVERY IN BAYELSA STATE

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CERTTIFICATION

This is to certify that this thesis **"Examination of the Factors Affecting cost of Construction Projects Delivery in Bayelsa State"** was carried out by **Oribo Nanie Einstein (Reg.No: 20154946278)**, of the Postgraduate School, Department of Project Management Technology, in partial fulfillment of the requirements for the award of the Master of Science (M.sc) in Project Management Technology and is hereby presented for acceptance as a contribution to knowledge and learning.

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DEDICATION

This thesis work is dedicated to the Almighty God, who made it possible for it to be accomplished.

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I give the Almighty God all the glory for the successful completion of this thesis.

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ABSTRACT

This study aims to examining the factors that significantly affect the cost of construction project delivery in Bayelsa State, Nigeria. Understanding these factors is crucial for stakeholders in the construction industry to effectively plan, budget, and manage projects, ultimately leading to successful and cost-effective project completion. The research involves cross section surveys of client, consultants, and contractors in the construction industry in Bayelsa state. A total of 70 questionnaires were administered using convenience sampling methods. Descriptive statistics using simple bar chart was used to analyze respondents' demographic data. Chi square tests and Kendall's W tests was also employed to investigate relationships between variables. The statistical package for social sciences (SPSS) was used in analyzing the data. Results showed that Escalation and inflation of cost of materials, Supplier manipulation, Duration of contract period and Economic instability are the most significant factors affecting the cost of construction project delivery with mean ranks 17.61, 17.61,17.42 and 17.22 respectively as agreed by respondents. While waste on site and dispute on site are
the least significant factors with mean rank 4.92 and 6.28 respectively. The findings from this analysis will provide valuable insights into the specific challenge faced in Bayelsa State and offer recommendations to mitigate cost overruns and enhance project efficiency.

Keywords: Construction method, Price of Materials, Cost of labor, Economic Conditions, Regulatory Constraints, Design Cost, Project Delivery.

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND OF THE STUDY

In Bayelsa State, many construction projects have failed owing to various technical and financial pressure of cost, quality and value optimization placed by different participants. The full responsibility for the effective regulation of the operations of an enterprise towards the achievement of a given tasks demand that operators of the construction industry be well trained in the science of handling cost of project construction. The Project manager is an integral part of the professional contributors to project evolution, design, and supervision. He is essentially the professional cost and financial consultant on major construction projects investment. He should be groomed on how to achieve a good project costing.

Bayelsa State like, like many other states, requires a healthy developed environment and this development can consume more than 65% of the states' total capital investment annually.

It becomes obvious that Bayelsa State like other developing and industrializing states in Nigeria requires an effective domestic construction industry.

This is imperative as viable economic growth cannot be achieved without modern construction projects such as factories, warehouses, roads and so on; and these necessitate an improved standard of living for the populace.

The construction industry being solely responsible for economic growth of the state will base on the government fiscal policy and budget to formulate its own policy plan on how to carry out the development within that budget and equally give the state a healthy developed environment. Besides, the overall aim of cost control and management is to make sure that the scarce resources are utilized to the optimum benefits of the main parties to a construction contract. That means that design and execution of a project should produce maximum value for money. Given therefore, the high-cost rate of money for construction resources and high interest in our dwindling, deregulated and depressed economy, it is pertinent that efficient costing should be a very strong element in project design and implementation.

The economic aspects of construction are complicated by the fact that the functions of design and production are generally separated. At the design stage, the designer will usually not know the methods and equipment available to the contractor who may ultimately build the project, and who is directly responsible for the materials used, which for most buildings account for about two-thirds of the total cost of the project. This is not to suggest that the contractor has no contribution to make but, since the labour which he controls cost only about half that of the materials, his efforts can easily be nullified by any design which makes excessive or unnecessary use of materials. This will have serious adverse effect on the project cost, its execution and completion date and it delay may lead to an outright abandonment.

The need to have cost data available from the earliest stages of the design has encouraged the development of methods of "cost planning" and the wider application of such techniques if cost is to become as it should be, an integral part of design. All these should be geared towards effective cost management and control as a solution to project abandonment.

Management is a leading factor in any investment. Prosperity breeds mismanagement. Paradoxically, management is the single factor which forces an upturn in a recession. Management is the single factor which separates prosperity and recession. It is the resources well managed or mismanaged today that makes for tomorrow's prosperity or depression. The economic depression we are now facing is more out of mismanagement of resources than lack of resources. The key to the success of our construction investment industry is professional management. There is urgent need for innovations in the cost management of our construction resources for viable products. The vital question however is whether the Project Manager being the construction cost planner is economizing enough the variables that affect the cost of construction which are supposed to be under his control in other to bring down cost of construction to a tolerable level.

1.2 STATEMENT OF THE PROBLEM

In Bayelsa State, many constructions Projects development have failed owing to the various technical and financial pressures of cost, quality, and value optimization. Jagboro and Banalola (2014), wrote that the interim report of the Presidential panel on contracts at the wake of the present democratic government confirmed a staggering amount of over four hundred and fifty billion naira for project which can be classified as failed contracts. The main reason for this is not far-fetched as many of the professional firms involved in project administration lack adequate management inputs in both quantitative and qualitative terms.

Another reason that is being speculated for high rate of projects abandonment and failed contracts in Bayelsa, is that in most government projects, the mobilization fee which is given to the contractor is reimbursed to those who awarded the contract as "bribe" usually of huge sums of money and this thereby increases the cost of the project, affects the quality of job executed by the contractor and will also leave the project either unexecuted or abandoned. This is because the money meant for the project execution have been diverted into individual pockets (Osemenam, 2012).

However, the design of building and other infrastructure is predicated on different contributors exhibiting various professional skills with a view to obtaining an optimum design solution. These inputs are based on the understanding of design and execution parameters ranging from functionality and usefulness of the project,

aesthetics and appearance, safety of the structure, quality of workmanship, cost and financial matters and most importantly client's satisfaction with the project on completion. Business everywhere is faced with everyday challenges for survival and the need to adapt is very important. Appointing the project manager at the right time and seeking his professional advice for cost matters is a very key problem in the Nigerian construction delivery.

This work has been embarked upon to find answers to the research problems by examining cost management and control as one of the effective management methods; its application/procedures, its impact to project management and its uses and acceptability in the Nigerian construction industry using selected L.G.A in Bayelsa state, as the source of data for the study.

1.3 AIM AND OBJECTIVES OF THE STUDY

The aim of this research work is to examine the factors that affect cost of construction projects in Bayelsa State. To achieve the aim, the following objectives are to be carried out:

i. To examine the nature of the construction industry in Bayelsa State.
ii. To examine cost management and control measures for project delivery in Bayelsa State.
iii. To evaluate the major factors that affects the cost of construction projects.

iv. To determine the effects of these factors on the cost of construction projects in Bayelsa State.

v. To rank these factors according to the severity of their effects on construction projects.

vi. To determine the appropriate ways to reduce construction costs in Bayelsa State.

1.4 RESEARCH QUESTIONS

In other to achieve the objectives of this research work, the following research questions were addressed:

i. What is the nature of the construction industry in Bayelsa State?

ii. What are the cost management and control measures for project delivery in Bayelsa State?

i. What are the major factors affecting cost of construction in Bayelsa State? ii. What are the effects of these factors on the cost of construction projects in Bayelsa State?

iii. What is the severity of these factors according to the opinions of construction project stakeholders?

iv. In what ways can the cost of construction projects be reduced in Bayelsa State?

1.5 SCOPE AND LIMITATIONS OF THE STUDY

This work covers factors affecting construction cost in Bayelsa State. The study covers projects located in the nine Local Government Areas of Bayelsa State, namely: Ogbia L.G.A., Yenagoa L.G.A., Southern Ijaw L.G.A., Brass L.G.A., Ekeremor L.G.A, Kolokumu L.G.A., and Sagbama L.G.A. The projects considered were both roads and building projects.

1.6 SIGNIFICANCE OF THE STUDY

This study will be useful in the following ways:

First, the study would have available information about the factors affecting construction cost in Bayelsa State. This is useful information that would add to the body of knowledge.

Secondly, the study will be useful to the construction projects stakeholders that include the professionals, the client, the contractor, the project manager, and the others. Also, the outcome of this study will be useful to the sectors of financial institutions that oversee given out loans for construction projects.

The findings of this research work will also be useful to research institutions, including the academic community.

CHAPTER TWO

LITERATURE REVIEW

2.1 THE NATURE OF THE CONSTRUCTION INDUSTRY IN BAYELSA STATE.

The construction industry is an important industry that plays a vital role in the socioeconomic growth of the Bayelsa economy. Economically, it contributes in significant improvements in the overall GDP of the State. It also improves the quality of life by providing the necessary infrastructure such as roads, hospitals, schools, and other basic and enhanced facilities. The industry also generates employment opportunities which places it second to the Government in the employment of labour (Husseini, 2013). Furthermore, the construction industry is said to have contributed about half of the total stock of fixed capital investment in the Bayelsa economy (Olaloku, 2011). Hence, it is fundamentally crucial to make construction projects completed successfully within time, cost budget and expected quality.

But the cost of carrying out construction projects keeps on increasing by day (Buhari, 2014). This is because it is a complex, fragmented and schedule driven industry that always faces chronic problems such as low quality of productivity, cost overruns, time overruns, construction waste management and others (Olawale et al, 2010). The term "cost" is ambiguous since it has several meanings to different persons. To a financial or cost accountant, it means the main elements which go to make a product,

hence basically classifying cost into material, labour and equipment cost. Hanson (2004) defined cost as "the cost of producing a certain output of a commodity. It is the sum of all the payments to the factors of production engaged on the production of that commodity".

Enyi (2011), refers to cost as "the expenses incurred on the course of realizing a revenue or implementing a project, and these costs are fixed, variable and semi - variable in nature" To the "Pure" economist, cost must be viewed in realistic terms, in which case the real cost of any product or services is the cost of the alternative that was foregone. For instance, if a client has a certain amount of money, say N1,000,000.00, and is faced with the choice of erecting a residential building or a factory and the said client settles for the residential building, then the real cost of the residential building is the factory that was forgone.

Besides, as stated in the oxford dictionary that cost is the price to be paid or amount of money needed for something, this means that cost is the actual liquid cash or money required for an exchange of goods and services (Olowo,2014). However, with respect to building works, Ferry (2004), highlighted that cost signifies monetary expense to the client as distinct from the cost of labour, plant, and materials, incurred by contracting and sub-contracting organizations. Hence, it implies the amount which the client will have to pay the contractor to construct the building but not the actual cost to the contractor for erecting it. Precisely, it is the amount paid by the client for either the completed building or for specific sections of the building.

Moreover, Oforeh and Alufohai (2012), wrote that to the construction economist, the products of the industry are regarded as life objects that remain active throughout their life span. In the process of its existence or activity, some other elements of costs arise, aside from the initial costs. The true cost of a project therefore is an integral of the birth and lifetime cost of the project analyzed over anticipated and defined minimum quality or standard of performance.

The approach of the construction economist is based on both the realistic and actualist concepts against a background of identifiable performance related factors considered over time. This approach is the basis of cost planning executed by project managers on individual projects at the micro economic level of construction. Subsequently, apart from decision making, the task before the Project Manager can broadly be classified into cost planning and cost control.

2.2 COST MANAGEMENT AND CONTROL MEASURES FOR PROJECT DELIVERY

2.2.1 COST PLANNING

According to Olowo (2014), construction projects are costly and time-consuming ventures.

To initiate a project, an organization must devote a large measure of its own resources to produce a result that will be financially rewarding. However, most construction

projects in Bayelsa State run behind schedule because of inadequate utilization of planning and controlling techniques.

Planning entails setting objectives and deciding on the best ways of achieving the objectives. According to Chiara (2013), Planning in a project environment may be described as estimated and predetermined course of action within a forecasted environment because there cannot be any planning without forecasting. Thus, cost planning involves determining what needs to be done by who, when and how, in order to fulfill ones assigned responsibility in a project environment.

Cost Planning, which is of intellectual operations (performed by management) as well as mechanical operations (performed by subordinates or machines) is the phase of the operations that must determine the success or failure of any project and comprises of forecasting, objectives, policy, programming, scheduling, budgeting, organization, standards, procedure, and communications.

On the other hand, Seeley (2010) define cost planning as the term used to describe any system of bringing cost advice to bear upon the design process. Hence, cost plan is the statement of the proposed expenditure on each section or element of a new building related to a definite standard of quality. Each item of cost is generally regarded as a cost target and is usually expressed in terms of cost per square meter of floor area of the building as well as total cost of the elements.

Thus, the objectives of cost planning include the following:

(i) to ensure that the sum of money which the client sets out to spend on a project is not exceeded.

(ii)to ensure that the client obtains good value for his money.

(iii) to ensure that the money to be spent on a project is rationally distributed.

From the foregoing, it is imperative to state that the task placed before the Project Manager is to forecast the economic environment he operates in order to set out an adequate budget to be monitored accordingly. Hence, it is pertinent for him to plan construction costs into: (i) Cash flow forecasting, and (ii) Cost Budgeting.

2.2.2 CASH FLOW FORECASTING

Although, various methods are available in financial accounting and management forecasting, but in the construction industry, the statistical techniques are most widely used for cash flow forecasting (Okoye, 2008). This is because cash flow forecasting based on the programme of work and statistical records and projections of expectations has proved an efficient tool in contract management and administration. The programme of work could be prepared using the bar charts or the critical path method (CPM).

According to Alkhadi (2013), cash flow forecasting in the construction industry could be prepared by a wide range of construction participants including site/project

managers, supervisors, quantity surveyors, Architects, or site Engineers. It could be equally prepared by a skilled technician who has had varied and diversified experiences in construction. It should be recalled that no data will ever be better than the information upon which it is based. The quantity surveyor by training, skill and experience has proven to be the best qualified of all the construction participants for the preparation of cash budgets and financial statements. This is so because, cash flow forecast involves the analysis of periodic materials and labour contents etc., required for a project actualization including their cost implications. The quantity surveyor should therefore understand that this work schedule falls directly on his shoulder and should be always ready to furnish the client or the contractor with necessary information on cash flows. This is part of the quantity surveyors cost advice and control at the post contract stage.

In calculating cash flows, the value of work overtime and the cost of work overtime must be assessed over a stated period. According to Akintoye (2002), there are basically two methods of cash flow controls in the construction industry. They are the income/expenditure method and the discounted cash flow methods.

2.2.3 THE INCOME/EXPENDITURE METHOD

The assessment of the profitability of a particular construction work consists basically of knowing the value of work executed at a specific date compared with actual costs incurred in achieving that value of work. The difference between the two figures will be the amount available to allocate to the off-site over heads of all company to fund

its working capital and make a profit. In some adverse situations, the actual cost of construction on site may exceed the value of the work that those costs have generated. It is the duty of the Project Manager to trace the causes of the problem, identify them and proffer solutions.

2.2.4 THE DISCOUNTED CASH FLOW METHODS

The timing of income and expenditure is very important. A sum of money in the future will always be worth less than the same amount of money today and the difference will depend upon the length of time involved and the probable interest rate. The time value of money is therefore very important. If a contractor's payment is delayed beyond the one month stipulated period, the sum when finally paid will be worth less than it would have worth if paid at the right time. Locked up capitals are either from the company's reserves or borrowed. When borrowed, interest should be paid but if the company uses its own reserves, it is being deprived of the interest earning capability of the cash and should therefore charge the project for interest lost. It is based on this promise that all payments and receipts on a project are discounted to a common date to be able to measure the true profitability of the project.

According to Benthy (1980), there are basically three ways of doing this:

(i) the net present value (NPV).

(ii) the internal rate of return (IRR), and
(iii) the profitability indexes.

2.2.5 NET PRESENT (OR DISCOUNTED) VALUE

Calculating the present value of future cash allows us to place all cash flows on a current footing so that comparisons can be made in terms of today's naira. The present worth of N1,000.00 received today is easy - it is worth N1,000.00. However, what is N2,000.00 received at the end of 10years worth to you today? We would answer the question by first asking what amount (today) would grow to be N2,000.00 at the end of 10years at 18% compound interest. This amount, according to experts, is called the present value of N2,000.00, payable in 10years, discounted at 18%. In present value, problems like this interest rate are known as the discount rate or capitalization rate. Also, the 18% interest rate could be referred to as the opportunity cost of the funds.

In Net present value, the income and expenditure are both discounted at criterion rate, that is the borrowing rate plus risk, and the difference found. If the discounted income (Benthy, 1980), exceeds the discounted expenditure, then the NPV is positive and represents a profit over and above the criterion rate. Another way to express the acceptance criterion is to say that the project will be accepted if the present value of cash inflows exceeds the present value of cash outflows.

2.2.6 THE INTERNAL RATE OF RETURN

The internal rate of return on an investment or project is the annualized effective compounded return rate or rate of return that makes the net present value of all cash flows from a particular investment equal to zero (Fisk, 2010).

In more specific terms, the IRR of a project is the discount rate at which the net present value of costs, that is negative cash flows, of the project equals the net present value of the benefits, positive cash flows, of the project.

IRR calculations are commonly used to evaluate the desirability of investments or projects. According to Fisk,2010), the higher a project's IRR, the more desirable it is to undertake the project. Assuming all projects require the same amount of up-front investment, the project with the highest IRR would be considered the best and undertaken first. The disadvantage is that it involves a trial-and-error procedure to arrive at an acceptable discount rate.

2.2.8 COST BUDGETING

The concept, "budget", defines the translation of an organizational plan into concrete form by way of resources allocation in form of cash (Oforh and Alufohai, (2006). A budget is made up of two sides - Expenditure and Revenue. Just as budget have been used to plan country's economy, firms have been compelled because of the growing complexity in the construction industry to draw up budgets. It is through budgets that plans can be executed. Budgets are used to convert such plans and policies into qualitative and monetary terms which form the fundamental objectives of the firm.

The process of budget estimates is used by firms to decide on policies of either expansion, contraction or maintaining the statuesque. It is the process which helps to shape the policy of the firm as regards future line of action depending on the market situation. The execution of any project by a contractor requires cost control.

Cost control is done by way of project planning and scheduling using different types of qualitative techniques available to the industry. The logic of these planning is to enable the contractor to exercise effective control over his resources. It is the duty of the management team to ensure that task is carried out in accordance with the planned line of action. Fresh plans are prepared when changes are necessary and unavoidable. It is the desire to achieve this planned line of action that a system of monitoring must be initiated.

2.2.9 COST MONITORING AND CONTROL SYSTEM

Controlling and monitoring of projects occur when ways to track the course of all activities and events in the project are established. A project is always a dynamic entity since it must respond to changing conditions for it to be completed successfully. It is carried out in an environment of ceaseless change and there is a continual need for re - assessment and re-appraisal of the project plan. Among the factors liable to alter the course of a project include changes such as the following (Olateju, 2003):

(i) The technical specification of the project.

(ii) The project completion date.

(iii) Budget considerations.

(iv) Relative priorities of projects.

(v) Revision of activity duration estimates.

(vi) Re-assessment of resource requirement for individual activities.

(vii) Technical difficulties or construction methods.

(viii) Unexpected weather conditions.

(ix) Working conditions

(x) The economy

(xi) Resource availability

(xii) Management and others.

However, some of these changes will have a pronounced impact on the project while others have a mere subtle one. Either way, the changes could affect the project in terms of quality, quantity of work, cost, and time. To fully avoid this, a proper cost monitoring and control system must be established. At the onset, there is an important difference between monitoring and control.

Monitoring, according to Olateju (2003), is finding out the state of project progress. It has to do with reporting whether one is measuring money or time or any other property in which one is interested. It is a vital pre-requisite to control, but a vital tool needed by control rather than a substitute for it.

Control is taking whatever steps that are necessary to vary or alter a pattern of events.

It is a positive and active operation which its success can be judged by subsequent events. Taking decisions in the exercise of control demands sound information which is the result of good monitoring.

2.2.10 SCHEDULE MONITORING

When a project is monitored to determine if everything is proceeding as scheduled, data collection is necessary to detect the type of problems that might likely be encountered. The project manager should therefore collect data along the following line:

(i) Collect information on any differences between estimated start dates and actual start dates for each activity.

(ii) Determine any differences between estimated finish dates and actual finish dates for each activity of the entire project.

(iii) Check for any unexpected delays or other abnormalities that may likely alter the project's completion date.

(iv) Are there any activities performed out of network sequence?

(v) Are there any milestone activities that appear unachievable?

Once the above stated information is collected and analyzed, a series of actions to rectify any situation can be performed. For example, according to Joan (2010), a schedule can be updated by re-assessing the duration of specific activities or one can

re-sequence or eliminate activities reflected in the current version of a programme chart.

2.2.11 RESOURCE MONITORING

To complete a project, three main resources are usually watched very closely. They are man, materials, and equipment (Ibrionke, 2014). When left uncontrolled, the cost associated with utilizing these resources will likely escalate, so there is need to really track closely the use of these resources.

According to Ibrionke (2014), resources utilization could be determined in basically three ways, namely meetings, inspections and forms. Meetings especially site meetings, provide one with the opportunity to acquire information rapidly. Inspections allow one to witness what and how certain resources are being used by staff and other subordinates. While forms allow one to quantitatively determine the amount of resources being used and the cost associated with using those resources. In addition, forms serve as an excellent historical record on what occurs throughout the project.

2.2.12 BUDGET MONITORING

A project is monitored to determine whether the progress is proceeding according to budgeted plans and one of the aims is to determine the overall financial condition of the project. This could be accomplished by detecting quantitative variations at any given point in time, either for a specific activity or the entire project. One can accumulate cost data from a series of sources, usually related to manpower, materials,

overhead and other changes, and compare the actual accumulated data for a particular activity or the entire project with the estimated cost. With that one can analyze any difference variances and take such actions as curtailing resources devoted to a project on selecting alternative materials.

2.2.13 COST CONTROL

Control is defined as checking, verifying, or regulating (Car, 1989). Planning enables management to establish realistic standards against which performance can be matched during contract. Cost control is used to maintain the cost within the budget by forecasting the expected cost through frequent short term planning exercises. Olateju (2009) emphasizes that the main objectives of monitoring and control are to ensure that the overall period of completing a project is not exceeded and this is achieved at the minimum cost.

2.2.14 MATERIALS COST CONTROL

The prime purpose of material costing is to ensure that purchases do not exceed the planned distribution of budgeted expenditure for the project. As reported by Ibrionke (2014), the building establishment defines material control as covering realistic design, specification and procurement of goods, their packaging, handling, storage, and protection after fixing. The procurement of materials is based on the material schedule already prepared during pre-contract planning so that any shortfall or excess can easily be determined during the project execution. Recovering report form,

purchase order, and material requisition form, are typical standard documents needed for material monitoring and control. Other important documents are invoices, delivery notes, advice notes, among others. All these are to ensure good financial discipline and proper material cost control.

2.2.15 LABOUR COST CONTROL

This involves the use of labour time and cost reports. Labour timecard reports the hours of time for every trade man and the project cost codes to which the labour is applied. Also, the foreman or supervisor should record the hours spent by site labour. The total gross payroll can then be debited to a labour variance account on a weekly basis and the weekly summary of man hours spent on each activity can be used to debit the labour cost to each activity account. The total of these debits can then be credited to the labour variance account. This man-hour method has a dual purpose in placing the proper perspective on labour costing both for project control and for future estimating (Amusan, 2011).

2.2.16 EQUIPMENT OR PLANT COST CONTROL

Since equipment costs are usually expressed as a time rate of expense, time reporting is an important step in equipment cost reporting (Udoh 2004). The procedure for the preparation of equipment cost report is like that of labour. Equipment costs are matched with the corresponding quantities of work produced. The reports tend to summarize all equipment cost incurred on the project up to the effective date of the

report. It helps to compare the estimated, as in equipment schedule, with the actual equipment unit cost for each type of work.

2.2.17 SUB - CONTRACTS

Subcontract performance and costing would be treated in a similar fashion with materials (Obiegbo, 2013). Separate orders would be issued for each service to be performed and the accounting would be identical. It is essential in this case that the sub-contractor in submitting his quotation is made fully aware of the implications of the system and of the effect on the project duration of his activities. In addition, certain specific events or milestones should be included in the network for an assessment of the sub contractor's performance and his progress payment would be tied to these control events. During the execution of the contract, it is necessary for all parties to co-operate in any desirable re-planning and to define and evaluate variations promptly so that modifications may be incorporated into the networks timely.

2.2.18 OVERHEADS AND INDIRECT COSTS

Overheads and indirect costs are as much part of the project as the direct cost. Examples of indirect cost are costs of project services like telephone, mail office, maintenance, utilities, indirect labour, materials handling, production control, etc., and other functions or areas making a cost contribution to the work packages which may be difficult to measure directly (Achuenu, 2006). Many firms handle these costs by adding a fixed percentage to the direct cost of a work package or by distributing them in proportion to the total cost of the work package.

According to Enekwench (2006), the tools used by management and cost supervisors for planning, monitoring, and controlling of projects include the following:

i. The Gantt chart and ii. The network analysis which comprises,

iii. Critical path method (CPM), and iv. Performance or Project Evaluation and Review Techniques (PERT).

2.2.19 THE GANTT CHART

Gantt Charts, commonly wrongly called gantt charts, are extremely useful project management tools. The Gantt Chart is named after the US engineer and consultant, Henry Gantt (1861-1919), who devised the technique in the 1910s (Enekwechi, 2006). Gantt charts are excellent models for scheduling and for budgeting, and for reporting and presenting and communicating project plans and progress easily and quickly. But as a rule, Gantt Charts are not as good as the Critical Path Analysis Flow Diagram for identifying and showing interdependent factors, or for mapping a plan from into all of its detailed contributing elements.

A Gantt chart can be constructed using MS Excel or a similar spreadsheet. A Gantt chart can be used to keep track of progress for each activity and how the costs are running. Gantt Charts are probably the most flexible and useful of all project management tools, although they do not very easily or obviously show the importance and inter-dependence of related parallel activities, and they won't obviously show the

necessity to complete one task before another can begin, as a Critical Path Analysis will do (Bill, 2010)

A wide range of computerized systems/software now exists for project management and planning. Project planning tools naturally become useful also for subsequent project reporting, presentations, and so on.

2.2.20 THE NETWORK ANALYSIS

Network analysis is a method of planning and controlling cost by recording their interdependency in a diagrammatic form that enables each fundamental problem involved to be tackled separately (PMI, 2004).

Network analysis techniques achieve their purpose in three broad steps:

(i) They present a diagrammatic form and picture of all the jobs or activities to be done and of their dependency on one another.

(ii) They consider the limitations imposed by the availability of estimate and the time required to do each job, and

(iii) They apply the estimated job time to the network diagram and then analyze the network. Analysis in this case means the calculation of the total length of time involved in the network.

Network analysis comprises the Critical Path Method (CPM) and the Performance Evaluation and Review Techniques (PERT). The CPM network diagram unlike the Gantt chart provides enough detailed information to assess the effect of a delay associated with any phase or activity. The CPM diagrams provides more "Micro" information than Macro information i.e., it provides more specification to evaluate the progress of a project (Ivor, 2009).

The major advantage of the CPM is the clear identification of the critical and noncritical activities which helps in the diversion of construction resources, when necessary, especially when there are delays in critical activities. The Performance Evaluation and Review Techniques (PERT) is best for new and complex projects with extreme degree of uncertainty. To update CPM diagrams, one need to collect information, otherwise the diagram becomes merely a historical document rather than an action tool (Ivor, 2009). One can collect information from many sources including existing documentation, meetings, and discursion with project participants.

2.2.21 COST MANAGEMENT INFORMATION SYSTEM

The concept of information management could concisely be stated as concerned with the handling and processing of data to produce an adequate information that are directed towards the achievement of the organization predetermine objectives. Emiowele (2005), stated that the goal of Information Resources Management, IRM, is to put in place mechanisms that would enable a company to acquire or produce the data and information it needs and with minimum cost.

Cheroma (2007), sees MIS as an integrated approach for providing and interpreting and relevant data that can help managers make decisions. It can be a computer-based system or the total communication system. From these two definitions MIS can be define as the application of technology and management techniques to produce, communicate, and use information in business and general administration.

Technological support is produced in form of data processing, telecommunication, office automation and some other micro-processor-based equipment. As an information system, MIS should be responsible to a variety of information requirement for the effective management of an organization. All measurable data operating in the organization must be organized in a manner where it can readily be recorded, stored, processed, retrieved, and communicated as required by a variety of users.

2.3 MAJOR FACTORS THAT AFFECT THE COST OF CONSTRUCTION PROJECTS

According to Omoregie, & Radforth (2006), there are several factors that affect construction costs. He sampled the opinions of Contractors, Consultants and Clients and discovered 15 factors responsible for project construction cost escalation. Their findings revealed price fluctuation as the most severe cause of project cost escalation which is attributed to the limitations in exchange and rate which in turn affects construction material prices and general price level. Elinwa and Silas (1992) also identified 31 essential factors causing high cost of construction projects. Among these factors are fraudulent practices and kickbacks, and which are ranked second most

important factors. Fraudulent practices and kickbacks occasioned by greed are perpetuated by some major players in construction project delivery (Husseini, 2012). Frimpong, et al (2003), in their own research, identified some factors as underlying causes of delay and cost over runs in ground water construction projects. The most important of these factors in the opinion of Clients, Consultants and Contractors, were monthly payment difficulties from agencies, poor contract management, material procurement, poor technical performances, and escalation of material prices.

Also, a study in the United States of America, according to Kkangari, (2010), revealed other major factors that affect construction costs as including the following: bad profit, management incompetence, lack of experience, inadequate sales, loss of market and economic decline. Some other factors that affect construction costs, according to Eshofonie (2008), include the following:

2.3.1 WEATHER

Weather is the most uncontrollable factor that affects construction costs. Temperature and humidity affect productivity of workers. If the temperature and humidity are high, workers feel lethargic and lose physical coordination (Frinpong et al, 2003).

2.3.2 INADEQUATE AVAILABILITY OF RAW MATERIALS

According to Ogunlana et al, (2013) the reason for shortage of materials could be nonavailability of materials due to general shortages, poor communication between

sites and head office, poor purchasing, planning and materials coordination. For instance, is still being imported in Nigeria, while her cement production potentials surpass that of any other African country (Eyo, 2011).

Another reason materials are not available, according to Makoju (2010), is that 90% of the aggregate components for production and delivery of electricity in the country still depends on other developed countries.

2.3.3 MANIPULATION OF SUPPLIER

According to Manavazhi & Adhikari (2012), monopoly control of the market by some suppliers, work stoppages in factories, lack of industrialized materials, fluctuating demands forcing suppliers to wait for accumulation of orders and difficulty in importing raw materials from other countries, is a major factor that affects cost of construction project delivery.

2.3.4 GOVERNMENT POLICIES

Aibinu and Jagboro (2010) revealed that Government deregulation policies aimed at liberalizing the economy since 1986 are responsible for the instability in prices. It is therefore not surprising that fluctuation claims during these periods contribute significantly to additional cost.

2.3.5 ATTITUDE OF CONTRACTORS

According to Omole (2012), the major projects like heavy engineering, superhighways and general infrastructure can only be undertaken in Nigeria by a few contractors. These contractors know themselves and therefore an indirect cartel is formed. The contractors on tendering are in a vantage position to decide amongst themselves who gets which contract and at what price. What appears on tendering to be the lowest tender may be over 20% - 30% above the actual value of the job.

2.3.6 POOR PLANNING

Poor planning is one of the most important factors that affect cost of construction. Contractors must be aware of all resources that he might need for any project. The contractors, also, should utilize all resources in an efficient manner. Proper scheduling is the key to utilizing project resources, if not, the project cost will increase.

2.3.7 KICK BACKS AND FRAUDULENT PRACTICES

This factor was the second most important factor affecting construction cost in Nigeria as noted by Elinwa and Silas (1992). Hussein (2012) also noted that fraudulent practices and kickbacks occasioned by greed are perpetrated by some major players in the construction industry. The perpetrators of this act in the industry are predominantly found within the rank and file of contractors, consultants, and public clients.

2.3.8 INTERFERENCE FROM POLITICS

Omole (2012) reveals that 80 percent of the contractors in Nigeria are indigenous companies. The government agencies, in most cases are tele-guided by the political heavy weight to award contract to party stalwarts at very high prices. The consultants' estimates are disregarded in most cases when awarding contracts and where possible manipulated. It is a general knowledge that governments and parastatals particularly during the last political era give a very short time to consultants to prepare contract document for tender purposes.

2.3.9 LABOUR – MANAGEMENT RELATIONSHIP

There is always a gap between the project management and labour. This gap should be kept as small as possible, so that the relationship between management and labour may be strengthened. They should work as a team to build a project with minimum cost. If the relationship between management and labour is bad the morale of the labourers will decrease, and production will decrease leading to increased project cost.

2.3.10 MANAGEMENT OF CONTRACTS

Poor contract could be attributed to the way contracts are awarded. In most cases projects are awarded to the lowest bidder (Mansfield, Ugwu and Doran, 2011).

Some of these low bidders may lack management skills and have less regard for contract plans, cost control, over all site management and resource allocation. As we know in the case of Nigeria, contracts are usually awarded to politicians and wellconnected individuals irrespective of the apparent deficiencies in their relevant delivery potentials. Accordingly, Frimpong et al (2003) observed that most contractors

in Sub - Saharan African are entrepreneurs who are in the business of making money at the expense of good Management. Consequently, they pay low wages, submit very low bids and have very little, if any ability to plan and coordinate contracts.

2.3.11 INADEQUATE COOPERATION BETWEEN DESIGNERS AND CONTRACTORS

Contractors construct the project according to the project design. Normally, if the design has any mistakes, the contractors may apply the mistakes without knowing there are mistakes or without notifying and coordinating with the designer or the client. Implementing designs with mistakes obviously costs a lot of money.

2.3.12 MATERIALS COSTS

Material price is subject to supply and demand and is affected by many other things, including quality, quantity, time, place, buyer, and seller. Other factors affecting material cost include currency exchange, low or high demand, material specification, inflation pressure and availability of new materials in the country.

2.3.13 ADDITIONAL WORK

Additional work is related to design changes, which is due to lack of detailed briefing on the functional and technical requirements of the projects by the clients (Mansfield et al, 2011).

2.3.14 POOR FINANCIAL CONTROL ON SITE

Controlling the project financially on site is not an easy task. All resources need to be controlled: labour productivity, material availability, material waste, good and effective methods, using effective tools, equipment, good project planning and scheduling.

Project management should therefore be aware of all those factors to achieve better financial control on site.

2.3.15 SITE DISPUTES

Dispute is a major obstacle for any project. Normally disputes will exist if work does not match the contract document or if work is not included in the contract document. Any dispute will eventually delay the project and increase project cost.

2.3.16 MATERIALS PRICE FLUCTUATION

Omoregie and Radfort (2006) surveyed contractors, consultants and public clients and revealed price fluctuation as the most severe cause of project cost escalation in Nigeria. This could be attributed to the limitation in exchange rate which in turn affects construction materials prices and the general price level. Another factor is the unstable inflationary trend in Nigeria, which is a result of demand exceeding supply, creating a scarcity of goods which in turn leads to escalation of the goods.

2.3.17 CONTRACT PROCEDURE

The contract document is the ground rule between all parties (contractors, consultants, and clients). One part of the contract document is the contract procedure. The contract procedure shows the type of contract, payment procedure constraints and regulations within the contract. The type of contract affects the projects because of the risk involved in some types of contracts (i.e. lump sum). Unclear contract procedures will lead to disputes, project delay and cost overrun (Fisk ,2009)

2.3.18 WRONG METHOD OF ESTIMATION

This factor could be attributed to the unpredicted inflationary trend, lack of adequate training and experience at the senior management level, and fraudulent practices Mansfield et al (2011).

2.3.19 WASTE ON SITE

It seems that the little waste of construction material on site should have a very minor effect on the total material cost. However, this minor effect can reach up to 50 % of the total material margin of a project. So, waste on site has to be considered on tendering any project (Elinwa and Silas, 1992)

2.3.20 TRANSPORTATION COST

As the government increases the price of fuel, transportation companies raise the cost of their services to cover the fuel increase and that obviously translates to an increase in transportation cost.

2.3.21 DURATION OF CONTRACT PERIOD

Usually, the longer the duration of the contract the more resources will be put into the project. Any delay to a project will lead to an increase in the project cost. If the delay comes from the contractors, the project owner will lose the opportunity to invest in the project earlier. Also, if the cause of the delay is the client, the contractor may lose the opportunity to win other projects or suffer from the non - utilizing the full resources.

2.3.22 EQUIPMENT COST

Equipment cost becomes more expensive as new technology or special equipment is requested. Most heavy equipment run by diesel fuel and the price of diesel fuel has increased significantly.

2.3.23 MODE OF FINANCING BONDS AND PAYMENTS

Ogunlana et al (2013) reported that financing and payment of completed works is responsible for cost escalation in Nigeria. Generally, contractors are sometimes not paid in accordance with the contract conditions. There are cases where clients fail to honour Architect's certificate of payment for up to 6 months or more whereas the contact conditions, in most cases stipulates about 28 days. Most contractors when preparing their tenders make allowance for partial financing of the project. They charge the clients for payments of interests and bank charges on moneys they anticipate borrowing from the banks to finance these projects (Omole, 2012) The irregular financing of public projects is a major cause of liquidity problem for contractors: however, contractors can be paid in accordance with the contract

agreement if clients can generate the availability of adequate funds before the project commences (Mansfield et al, 2011).

2.4 FFECTS OF COST FACTORS ON CONSTRUCTION PROJECTS IN BAYELSA STATE.

The need to improve infrastructure has been identified as the key component in meeting the development needs of developing countries. Thus, projects are conceived and started with much enthusiasm or eagerness but oftentimes do not end in success owing to underfunding, not completed, very late in completion and sometimes remained abandoned for many years. This fact is an accurate picture of what is prevalent in infrastructure development projects in Bayelsa State of Nigeria. Particularly projects embarked upon in the State with a desired intent to satisfy the yearnings of the people are abandoned due to some of the reasons in section 2.3 of this thesis work. As a result of these problems, the cost of projects construction in Bayelsa State usually increases because of one of these factors or the other. This was corroborated by the submission of Oppong Danquah *et al.*, (2011) in their work.

2.5 APPROPRIATE WAYS OF REDUCING CONSTRUCTION COSTS.

According to Fisk (2009), there are several ways in which cost of construction can be minimized, but two of the measures are more popular than the others. The first is the application of a value engineering concept, which aims at a careful analysis of each function and the elimination or modification of anything that adds to the project cost

without adding to its functional capabilities. But carefully investigating costs, availability of materials, construction methods, procurement costs, planning, organizing, and similar cost influencing items, an improvement in the overall cost of project can be realized. The second measure that used to reduce cost is to provide comprehensive and error free designs and specifications to avoid misinterpretations by the contractor or delay due to missing details. Cooke and Williams (2003) recommended the elimination or minimization of design, specification, delivery and site wastes through the formulation and implementation of effective material policy and material management, as a cost reduction measure.

In addition, Ashworth (2012) observed that profitable firms may be generating their revenues from the elimination of waste at both professional and trade practice levels. Cost reduction measures also include establishing firmly the requirements and features of the project at the onset before getting started, preparing the project team to do its best by getting members to sign off on capabilities and responsibilities, staying diligent about keeping the project on the right path through contract clauses that disallow significant changes once the project is underway, effective human resource management through effective motivation, and project tracking involving discerning early what area or paths are leading to dead ends and applying early corrective actions (Asigo, 2016). The reduction of construction project costs can appropriately be carried out under two methods of project delivery, the Turnkey or packade deal method and the Traditional method.

2.5.1 TURNKEY OR PACKAGE DEAL METHOD

According to Oppong *et al.*, (2011), in their study on health infrastructure in Ghana, the Turnkey or Package deal is one of the alternative methods for reduction of cost of construction of infrastructure projects. This method has the following qualities:

(i) Easy acquisition of funds during implementation.

(ii) Easy management and monitoring since client had little role to play in the project implementation.

(iii) Users of Turnkey in project management do not have much to say, unlike the traditional method that requires their input.

(iv) Turnkey is usually practiced by the donor agencies who dictates the cost of the project and scope.

(v) It avoids delays and cost overruns because of timely flow of funds.

2.5.2 THE TRADITIONAL METHOD OF COST REDUCTION

In the same study, Oppong *et al.*, (2011) elucidates the benefits of using the traditional method as follows:

(i) The Traditional method is less expensive because cost is very important to the sector and the State as a whole, hence a method that provides planned stages in terms of design and cost is advocated for.

(ii) The traditional method is used to offer the local contractors the opportunity to compete as they often cannot financially compete for the Turnkey projects.

(iii) It allows for keener competition and recognizes the tripartite arrangement of client, consultant, and contractor throughout the project.

(iv) The traditional method is popular and well understood all over the world.

(v) It allows for selective tendering, which is key to its characteristics, that enhances competitive pricing from a selection of contractors and consultants of equal standing.

In comparing the above methods of contract administration and management, donor agencies prefer the open tendering arrangement which allows a greater number of firms to compete.

Post completion evaluation of infrastructure projects carried out with this method is however, a bane in the increase of cost of construction, because the staff and end users involvement is quite minimal, which results to defects not corrected as when necessary that will add to the cost of construction projects. Furtherance to the above, for effective use of the traditional method of contracting in the construction industry, there must be specific completion time or date, sufficient budgetary allocation funds for projects and projects devoid of political interference and enforcement of obligations among parties. In agreement to the above assessment, the study by Oppong *et al.*, (2011), recommended the following as quite necessary to solve the problem of non-completion of projects: Project initiation planning, Funding, Selection of contractors, consultants and Project supervision and evaluation. The study also advised that the following five major reasons for non-completion of construction projects, namely cash flow

problems, Poor Monitoring and Supervision, Poor performance of contractors, Political interference, and Land disputes, be paid attention to.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 INTRODUCTION

This chapter examined the design of the research work, the population and the sampling procedure, method of data collection and data analysis method.

3.2 RESEARCH DESIGN

The research obtained its data through primary and secondary sources.

3.2.1 Primary Data source

Collection of data through the primary source involved the use of a structured questionnaire that is based on the Likert 3-point statistical scale. But scale for the purpose of this research work was reduced to 3 points, namely strongly agree, agree, and disagree. Strongly agree was assigned 3 points, agree was assigned 2 points and disagree was assigned 1 point.

3.2.2 Secondary Data Source

Secondary data collection was based mainly on the review of related past literature and write ups in construction project cost detailed references were made to books, journals, conference/seminar papers, previous thesis works, and other forms of published materials that were considered relevant to the research subject matter.

3.3 POPULATION OF THE STUDY AND SAMPLE SIZE

The study was conducted in Bayelsa State. A total of eight Local Government Areas (L.G.A) in Bayelsa State were randomly chosen. The L.G.A are Ogbia, Yenagoa, South Ijaw, Nembe, Brass, Ekeremor, Kolokumu, and Sagbama. Multistage sampling technique was used to select the sample. The first stage involved the selection of the eight L.G.A in the state. The second stage involved the selection of 3 communities from each of the selected L.G.A to give a total of 24 communities, using simple random sampling technique. The third stage comprised of the selection of five construction project stakeholders that include the professionals (civil Engineers, Architects, quantity surveyors, project managers etc), the contractor, the client, the technicians (Masons, Carpenters, etc) and materials suppliers to give a total of one hundred and twenty (120) building construction projects workers, using simple random sampling technique. The researcher went to each of the eight L.G.A and obtained the list of the respondents.

3.4 METHOD OF DATA COLLECTION AND ANALYSIS

A set of structured questionnaires was used to elicit data from the respondents. The questionnaire was based on the objectives of the research work. The data were analyzed using frequency counts, percentages and mean represented in tabular form. The questionnaire, as already stated elsewhere in this research work, was based on the Likert measurement scale. The Likert measurement scale formula used for the research work is expressed as follows:

$$\bar{X} = \frac{\sum Fx}{N}$$

where,

$\bar{X}$ = The mean score

$\sum$ = Summation sign

Fx = Frequency

N = No of respondents

The scaling statements used were: “strongly agree”, “agree” and “not agree”, for the objectives of the study. The mean of the measurement scale was calculated as follows:

$$\frac{3 + 2 + 1}{3} = \frac{6}{3} = 2$$

DECISION RULE:

The decision rule is based on the mean value of, which is 2. Any mean value greater or equal to 2 is acceptable. But any mean values less than 2 are not acceptable.

STATISTICAL RULE FOR HYPOTHESIS TESTING

CHAPTER FOUR

DATA PRESENTATION AND ANALYSIS

4.1 INTRODUCTION

This chapter deals with the presentation, analysis and discussion of the data collected in the study. The respondents included Civil Engineers, Architects, Quantity Surveyors, Project Managers, Builders, Contractors, Clients, Technicians, Material Suppliers, etc. The respondents were given the questionnaire individually, and efforts was made to retrieve all the questionnaire after they have been filled up. In all, there were one hundred and twenty (120) questionnaires distributed and collected. Five were wrongly filled out and were not included in the analysis.

4.2. PROFILE CHARACTERISTICS OF THE RESPONDENTS

4.2.1 SEX OF THE RESPONDENTS

Table 1: Table showing sex of Respondents

Sex	Frequency	Percentage
Male	95	82.61%
Female	20	17.39%
Total	115	100%

SOURCE: Field survey, 2018.

Table 1 above shows that majority of the respondents were male (82.61%), while only

17.39% of them were females. This revelation shows that majority of the construction project workers are males dominated.

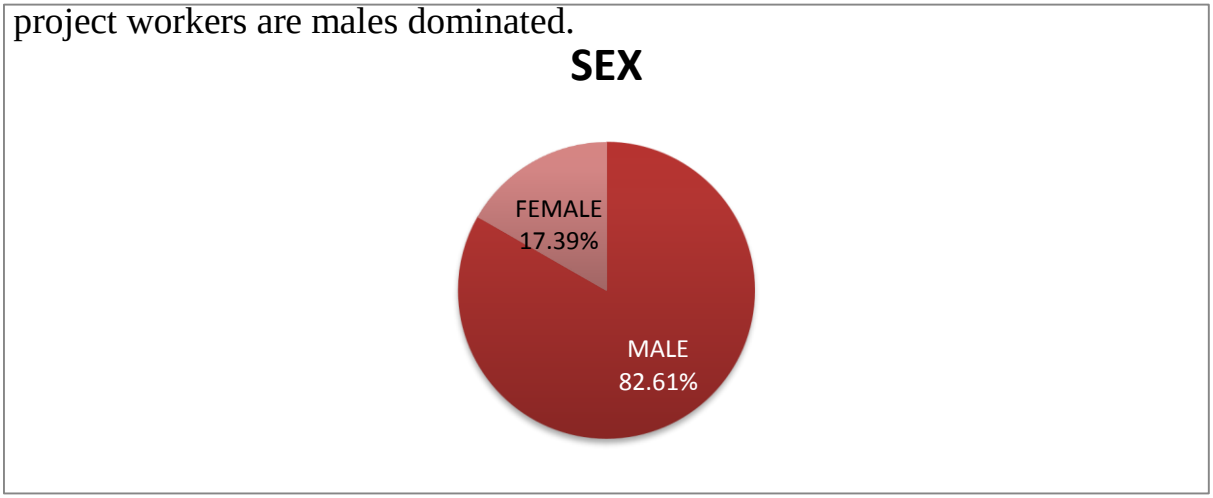

Figure 4.1: Pie chart showing sex of the respondents

4.2.2 AGE OF RESPONDENTS

Table 2: Table showing the age of the respondents

Age (in years)	Frequency	Percentage
Below 25	5	4.35%
26-35	70	60.67%
36-45	30	26.1%
Above 46	10	8.70%
Total	115	100%

SOURCE: FIELD SURVEY, 2018

From table 2 above, a greater proportion of the construction workers are within the age range of 26-35 years (60.87%). This shows that the respondents are matured enough to give acceptable information on the subject matter.

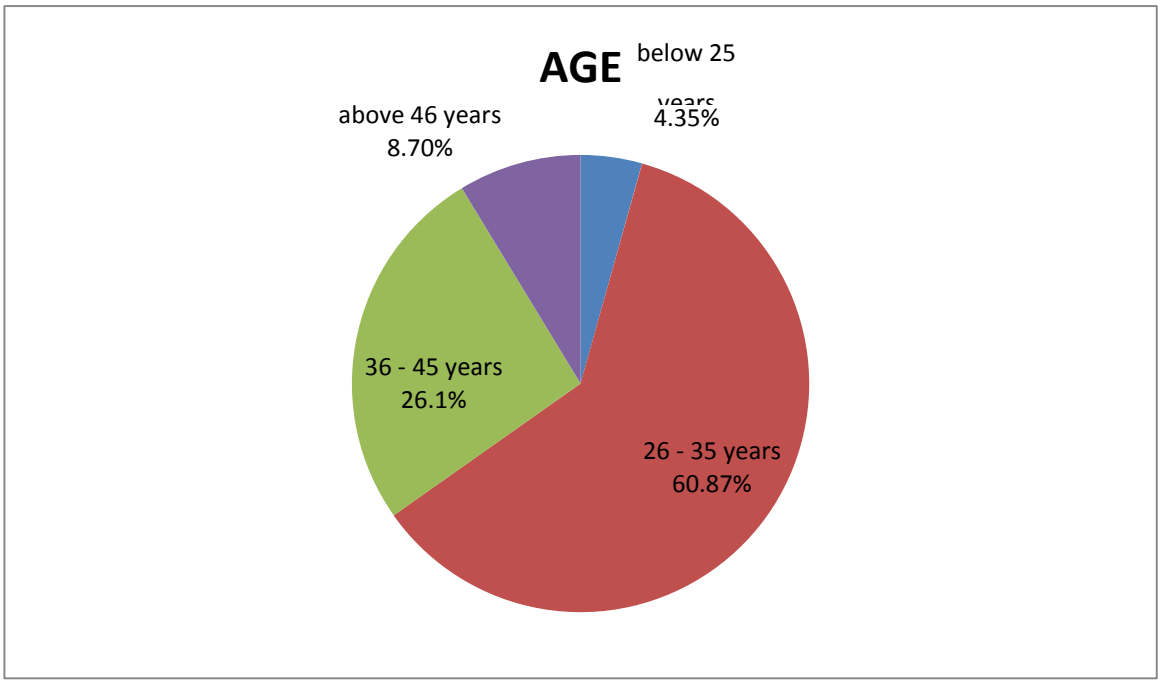

Fig.4.2: Pie chart showing age distribution

4.2.3. MARITAL STATUS OF RESPONDENTS

Table 3: Table showing the marital status of respondents

Marital Status	Frequency	Percentage
Single	25	21.74%
Married	90	78.26%
Total	115	100%

SOURCE: Field survey, 2018.

The table above shows that out of the 115 respondents, 90 are married. This figure represents 78.26% of the entire responds; representing 21.74% of the respondents are single. This shows that the respondents are people whose comments on the subject matter can be taken seriously.

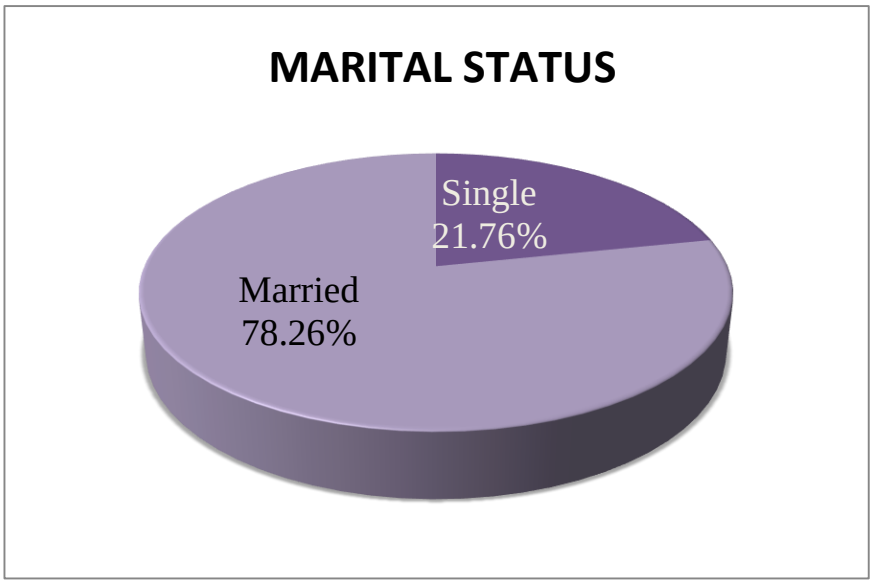

Fig 4.3: Pie chart showing Marital Status of respondents

4.2.4 LEVEL OF EDUCATIONAL QUALIFICATION OF RESPONDENTS

Table 4: Table showing the educational qualification of respondents.

Level of Education	Frequency	Percentage
Primary	20	17.39%
Secondary (O'Level)	55	47.83%
Diploma Holder	10	8.7%
Degree Holder	30	26.10%
Total	115	100%

SOURCE: FIELD SURVEY, 2018

From table 4 above, it can be seen that majority of the construction project workers were secondary school leavers, 47.83%, while also a good number of them had tertiary diploma and degree educational qualifications 8.70% and 26.10% respectively. The implication of this revelation is that respondents are knowledgeable and will therefore understand and interpret research questions.

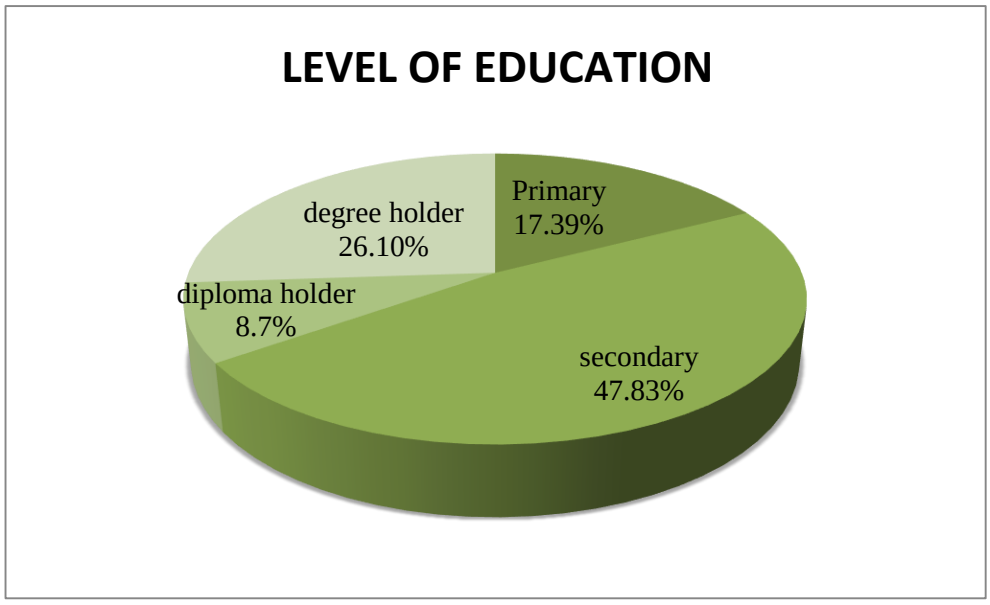

Fig. 4.4: Pie-chart showing educational qualification of the respondents

4.2.5 WORK EXPERIENCE (IN YEARS)

Table 5: Table showing work experience of Respondents

Work Experience (in years)	Frequency	Percentage
1 – 5	15	13.04%
6 – 10	18	15.65%
11 –15	32	27.83%
15 – 20	30	26.09%
21 – and above	20	17.39%
Total	115	100%

SOURCE: FIELD SURVEY, 2018

From the table above, 32 and 30 of the respondents representing 27.83% and 26.09% respectively have had good work experience in the construction industry to understand

and appreciate the problems of the construction project industry. Also, a good number of the respondents (17.39%) have had over 21 years experience working in the industry. These revelations show that the respondents are very experienced and knowledgeable to interpret research questions and make informed input in the questionnaire.

Fig. 4.5: Pie chart showing working experience

4.3. NATURE OF THE CONSTRUCTION INDUSTRY IN BAYELSA STATE

Table 6: Table showing the nature of construction industry in Bayelsa State

Nature of Construction Industry	**Strongly Agree (3)**	**Agree (2)**	**Disagree (1)**	**Mean X**	**Remarks**
Plays a vital role in the economy of Bayelsa Sta	70(210)	38(76)	6(6)	2.54	Agree
Cost of carrying out construction projects is very high	80(240)	32(64)	3(3)	2.09	Agree
Many construction projects in Bayelsa State failed due to financial pressures of cost	55(165)	40(80)	20(20)	2.20	Agree
Project and abandonment and failed projects in Bayelsa State may be due to fraudulent practices and kickbacks	45(135)	60(120)	10(10)	2.30	Agree
Cost of materials is very high, and that affects construction costs	30(90)	45(90)	40(40)	1.91	Disagree

High cost					
Inflation rate is too high and affects construction cost	40(120)	44(88)	31(31)	2.08	Agree
Number of constructions going on at the same time affects construction cost	31(93)	35(70)	49(49)	1.84	Disagree
Lack of coordination between designers and contractors affects construction cost	25(75)	40(80)	50(50)	1.78	Disagree
Construction cost in Bayelsa State is high due to inadequate contractor experience	23(69)	35(90)	57(57)	1.70	Disagree
Cost of construction and project failure are due to inaccurate cost estimating.	40(120)	59(110)	20(20)	2.17	Agree

In table 6 above, the result of the analysis shows the perceived nature of the construction project industry in Bayelsa State. The respondents agreed that the construction project industry plays a vital role in the economy of Bayelsa state. This

was testified with an average high mean figure of 2.54. The respondents also Believed that, in Bayelsa State, the cost of carrying out construction projects is very high (X = 2.09). Table 6 also revealed that may construction projects in Bayelsa State failed due to financial pressure of cost (X=2.30). The respondents also agreed that projects suffer abandonmet and failure due to fraudulent practices and kickbacks by those who award construction project contracts.

Although a reasonable number of the respondents agree that the costs of construction materials are very high in Bayelsa State, and affects construction costs, they did not believe it should cause project failure and abandonment (X = 1.91). The respondents also believed that the inflation rate is too high and affects construction costs (X = 2.08). The analysis of table 6 also revealed that the number of construction projects going on at the same time in Bayelsa State did not affect construction costs (X = 1.78). Contractor's lack of experience was sited elsewhere as a factor that affects construction costs in Bayelsa State; but the respondents in this research did not unanimously agree with that (X = 1.70). But they however agreed that inaccurate cost estimating on the part of practitioners is a major factor responsible for high cost of construction and project failure in Bayelsa State (X = 2.17). All these findings agree with the opinions of the experts in literature review, especially Buhari (2014), who stated that the costs of construction in Bayelsa State keeps on increasing by day.

4.4. COST MANAGEMENT AND CONTROL MEASURES FOR PROJECT DELIVERY

Table 7: Respondents opinions about cost management and control measures in the delivery of construction project in Bayelsa State

Cost Mgt. and control measures application for project delivery in Bayelsa State	**Strongly Agree (3)**	**Agree (2)**	**Disagree (1)**	**Mean X**	**Remarks**
Construction projects in Bayelsa State run behind schedule due to inadequate utilization of planning and controlling technique	10(30)	25(50)	80(80)	1.39	Disagree
Cost planning tool was not applied by project managers in project delivery in Bayelsa State.	30(90)	70(140)	15(15)	2.13	Agree
Project executors in Bayelsa State do not know about, nor	12(36)	25(50)	78(78)	1.43	Disagree

apply cash flow controls in their project delivery					
Project implementation team members in Bayelsa State do not carry plans out in lie with budgets	15(45)	70(140)	30(30)	1.87	Disagree
The Bar Charts is the main scheduling tool used in project delivery in Bayelsa State	65(195)	40(80)	10(10)	2.48	Agree
The Bar charts scheduling tool is deficient for managing large and complex construction projects in Bayelsa State	70(210)	33(66)	12(12)	2.50	Agree
Network analysis tool is a better method for planning and controlling cost because inter-dependencies of activities or jobs are	60(180)	43(86)	12(12)	2.42	Agree

recorded in a diagrammatic form.					
Network analysis tool such as the CPM, enables each problem involved in project delivery to be clear and be tackled separately.	54(162)	45(90)	16(16)	2.33	Agree
The CPM network analysis tool is not applied by contractors in Bayelsa State in project execution	56(168)	47(94)	12(12)	2.38	Agree

Table 7 shows the respondents mean score on cost management and control measures for project delivery in Bayelsa State. They include the following: Construction projects in Bayelsa State run behind schedule due to inadequate utilization of planning and project control tools (X = 1.39). This statement is not true as reflected from the mean score of the respondents' opinion. When, the researcher refrosed the preceding statement and asked the respondents whether cost planning tools were not applied by project managers in project delivery in Bayelsa State; they disagreed (X = 2.13). Also, when the respondents were asked if project executors in Bayelsa State do not know

about and applied cash flow controls in their project delivery works, majority of the respondents disagreed (X = 1.43).

Also, when the respondents were asked whether it is true that project team members in Bayelsa State do not carry project plans out in line with budgets. Most of them reluctantly agreed while some of them emphatically disagreed (X = 1.87).

When the respondents were asked whether the Bar Charts is the major scheduling tool used in Project Delivery in Bayelsa State; majority of them, 105 respondents out of 115 of them, agreed. This is a big revelation concerning why we are having problems with project delivery in Bayelsa State. According to Enekwachi (2006), the Bar Charts are not as good as the critical path Analysis Flow Diagram for identifying and showing interdependencies among the elements of a project. No wonder the respondents overwhelmingly agreed that the Bar Chart scheduling tool is deficient for managing large and complex construction projects in Bayelsa State (X = 2.50).

Table 7 also shows that 103 respondents out of 115 agreed that network analysis is a better method for planning and controlling cost because inter-dependencies of activities or jobs are recorded in a diagrammatic form. The table also showed that network analysis tool such as CPM, enables each problem involved in project delivery to be clear for being tackled separately. Majority of the respondents, 103 of the 115 respondents; also agreed that the CPM network analysis tool is not applied by

contractors in Bayelsa State in project execution. These revelations are in line with the opinion of Ivor (2009), who state that the major advantage of the CPM is the clear identification of the critical and non-critical activities which helps in the diversion of construction resources, when necessary, especially when there are delays in critical activities.

4.5. MAJOR FACTORS THAT AFFECT COST OF CONSTRUCTION PROJECTS DELIVERY IN BAYELSA STATE

Table 8: Table showing respondents response on the major factor that affect cost of construction project delivery in Bayelsa State

Major factors that affect cost of construction projects delivery in Bayelsa State	**Strongly Agree (3)**	**Agree (2)**	**Disagree (1)**	**Mean X**	**Remarks**
Price fluctuation is the most severe cause of project cost escalation in Bayelsa State	41(123)	62(124)	12(12)	2.25	Agree

Project cost escalation can be attributed to the limitations in the exchange rate	35(105)	65(130)	15(15)	2.17	Agree
Construction material prices is a major factor that affects cost of construction projects in Bayelsa State	42(126)	64(128)	9(9)	2.27	Agree
Fraudulent practices and kickbacks affect project delivery costs in Bayelsa State	38(114)	63(126)	14(14)	2.21	Agree
Monthly payment difficulties from Agencies affect cost of construction project delivery in Bayelsa State	40(120)	59(118)	16(16)	2.21	Agree

Poor contract management is a major factor that affects cost of project delivery in Bayelsa State	36(108)	58(116)	21(21)	2.13	Agree
Poor contract management is a major factor that affects the cost of project delivery in Bayelsa State	33(99)	67(137)	15(15)	2.11	Agree
Weather is the most uncontrollable factor that affects cost of project delivery in Bayelsa State	31(93)	65(130)	19(19)	2.10	Agree
Implementation of design that have mistaken by contractors affect cost of project delivery in Bayelsa State	32(96)	57(114)	26(26)	2.05	Agree

Dispute due to work that does not match contract document affects the cost of project delivery in Bayelsa State.	33(99)	52(100)	30(30)	1.99	Disagree

4.6. EFFECTS OF COST FACTORSON CONSTRUCTION, PROJECTS IN BAYELSA STATE

Table 9: Table showing the effects of cost factors on construction projects in Bayelsa State

Effects of cost factors on construction projects in Bayelsa State	**Strongly Agree (3)**	**Agree (2)**	**Disagree (1)**	**Mean X**	**Remarks**

Project embarked upon in Bayelsa State with a desired intent to satisfy the yearnings of the people in terms of utility creation are not realized	42(126)	60(120)	11(11)	2.24	Agree
Projects embarked upon to create jobs are not realized due to project abandonment	44(132)	63(126)	8(8)	2.31	Agree
The cost of construction in Bayelsa State usually increases because of lapses	40(120)	58(116)	17(17)	2.20	Agree
in the factors that should enhance project delivery					

Construction contractors in Bayelsa State are described as no performers because of indiscriminate abandonment of construction projects in the states.	35(105)	48(96)	32(32)	1.42	Disagree

Table 8 above shows the respondents opinions on the perceived effects of cost factors on construction projects delivery in Bayelsa State. When the respondents were asked for their opinions on the perceived effects if cist factors on project delivery in Bayelsa State, 42 of the respondents 60 of the same respondents strongly agreed and agreed respectively that the Bayelsa economy is lost due to project abandonment that was orchestrated by adverse behavior of cost factors.

Majority of the respondents, 107 of them out of 115 also are of the opinion that lack of job availability for the youths, are due to projects not being delivered as planned and budgeted. Also, the cost of construction in Bayelsa State usually increases because of lapses resulting from cost factors. This is evident from table 9, because 40 respondents out of 115 strongly agree to the statement along with 58 of the same respondents who also agreed. These responses are in line with the opinions of Oppong et al., (2011) in their work.

The foregoing notwithstanding, most of the respondents did not believe that the image of construction project contractors in Bayelsa State is dented as inefficient project team members, due to indiscriminate project abandonment, orchestrated by high cost project delivery.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 SUMMARY

The analysis of factors affecting the cost of construction project delivery has highlighted several key variables that play significant roles in project cost. These factors encompass various aspects of the construction process, including weather, inadequate availability of raw materials, manipulation of supplier, attitude of contractor, poor planning, kickbacks and fraudulent practices, interference of politics, labour-management relationship, management of contracts, inadequate cooperation between designers and contractors, additional work, poor financial control on site, site dispute and material and price fluctuation etc. By identifying and understanding these factors, project stakeholders can effectively manage and control costs, leading to successful project delivery.

5.2 CONCLUSION

The analysis has revealed that multiple factors contribute to the cost of construction project delivery.

Chi square test of association was carried out to investigate significant relationship between respondent's type of organization (among client, contractor and consultant) and their perception of the factors affecting the cost of construction project delivery in Bayelsa State. From the chi square analysis result presented in table 4.3, it was

deduced that respondents' type of organization (being a client, contractor or consultant) was significantly related to their perspective of the following factors; Additional work, economic instability, effect of weather, fraudulent practices, contractor's attitude and mode of financing bonds and payment, as very significant factors affecting cost of construction project delivery. Result from the Kendall's W test revealed that Escalation and inflation of cost of materials, Supplier manipulation, Duration of contract period and Economic instability are the most significant factors affecting the cost of construction project delivery with mean ranks 17.61, 17.61,17.42 and 17.22 respectively as agreed by respondents. While waste on site and dispute on site are the least significant factors with mean rank 4.92 and 6.28 respectively and also from table 4.5, the Kendall's W = 0.669 implied that respondents agreed substantially with one another to the cost factors highlighted. This study also discussed significant effects of the factors affecting the cost of construction project delivery. Results revealed that Project abandonment, Bad reputation and inability to secure project finance, tying down clients' capital with mean ranks 3.85, 3.59 and 3.20 respectively were the most significant effects of the factors affecting the cost of construction project delivery as concurred by respondents. Measures for minimizing cost of construction project delivery was also studied. Results from table 4.8 showed that Establishing fraudulent detecting system or systems of individual accountability to discourage pilfering, stealing and other related vices was the most crucial measure of minimizing cost of construction project delivery as agreed by respondents followed

by purchasing of bulk materials. Hence it is recommended that all stakeholders pay more attention to these measures.

5.3 RECOMMENDATIONS

Based on the findings of the analysis, the following recommendations are provided to mitigate the impact of factors affecting the cost of construction projects delivery:

Accurate Cost Estimation: Invest time and resources in thorough cost estimation processes, considering all project variables, such as materials, labor, equipment, and overhead costs. Regularly review and update cost estimates to reflect any changes in project scope or market conditions.

Robust Project Planning: Emphasize comprehensive project planning that includes clear objectives, detailed schedules, risk assessments, and contingency plans. Involve all relevant stakeholders during the planning phase to ensure alignment and reduce the likelihood of costly errors or omissions.

Effective Communication: Foster open and transparent communication channels among project participants, including the client, architects, engineers, contractors, and subcontractors. Clear and timely communication helps to minimize misunderstandings, resolve issues promptly, and avoid costly delays or rework.

Proactive Risk Management: Identify and assess project risks early on, and develop strategies to mitigate them. Implement regular risk reviews throughout the project lifecycle and allocate appropriate resources to manage and respond to potential risks.

Supplier and Contractor Selection: Carefully evaluate and select suppliers and contractors based on their track record, financial stability, expertise, and ability to deliver within the specified budget and timeframe. Regularly review and assess their performance throughout the project to ensure adherence to quality and cost standards.

By implementing these recommendations, construction project stakeholders can enhance cost control, mitigate risks, and improve overall project delivery, leading to successful and cost-effective outcomes.

REFERENCES

Achuenu, E. & Ujene A. O (2006). Evaluation of Labour and Material Costs in Building Elements in Nigeria. *Nigerian Journal of Construction Technology and Management,* 7(1), 99 – 110.

Adenoje, E. E. (1990). Factors which affect cost of Building in Nigeria Construction Industry. *The Reality Surveying Review. Vol. 1(i) 15-16*

Adrian V. Strokes (2005) (3rd ed). Concise Encyclopedia of Information Technology.

Akintoye, A (2002). Analysis of Factors influencing project cost estimating practice" *Construction Management and Economic, 182, 77-89.*

Akobundu, I. C. (2003). "Effect of Abandoned Projects". The Nigerian Quantity Surveyor. Vol. 31 Page 7.

Alkhadi, (1990). Factors affecting the Accuracy of Construction Cost Estimation in Saudi Arabia. *Master Thesis, Kingfaud University of Petroleum and Minerals.*

Amusan, L. M. (2011). Study of Factors Affecting Construction Cost Performance in Nigerian Construction Sites. *Unpublished Article, assessed fromhttp://eprints. Cvenant University.*

Bill Manfredonia, C. P. E, Joseph P. Majewaki, R. & Joseph J. Perryman (2010). Cost Estimating, Whole Building. *Design Guide (WBDG) – a program of the National Institute of Building Science U.S.*

Carr, R. L (1989). Cost, Schedule and Time Vacancies and Integration. http/www.Ricarr@umich.com

Cheroma, S. (2007): Consultants, Computerized Project Management Workshop Manual. Lagos, Nigeria.

Cook L. Raymond (2005). Study Guide for use with Management theory and application by Leslie W. Rue & Llodl Byars, Irwin Publishers, 1989. Cost Overrun" The Nigerian Quantity Surveyor, Vol 12 Page 4.

Elinwa, U. & Buba S. (1992). Construction Cost Factors in Nigeria. *Journal of Construction Engineering and Management. Vol. 119 No. 4 Pp 698 – 714.*

Emiowele, S. F. (2005): The Impact of Information Technology in the Practice of Quantity Surveying in Nigeria Cost Information System Being Paper Presented at the Conference of Heads of Quantity Surveying Departments in the Public sector held at Owerri (16 – 18th) August.

Enekwechi Charles Obi (2006): "Construction Project Management" The_Nigerian Quantity Surveyor vol 13 September 2006.

Enyi E.P. ESV (2007): A Dictionary of Accounting Terminologies Oxford Publishers 2007

Eshofonie, F. P. (2008). Factors affecting cost of construction in Nigeria. *A thesis presented to the department of Building University of Lagos Akoka, Lagos.* Hall L. (2007): Business Administration. Macdonald, and Evans.

Hanson (2004): A Dictionary of Economics and Commerce, Fourth Edition, Macdonald and Evans Ltd, London.

Hornby A.S (2005): Oxford Advance Learners Dictionary, special Price Edition, Oxford University Press, London.

Ibrionke (2004): "Effective Material Management in a Project Site" The Nigerian Institute of Builders, Vol 11, page 15.

Inc. Benthy, T. (1980). Making Cost Control Work. *New Jersey, Prince Hall. Eagle Wood Cliff*

Ivor S.H (2004**)**: Building Economics (Appraisal and Control of Building Design Cost and Efficiency) Macmillan Publishers. Ltd, London.

Jagboro D. A. & Banalola D. E. (2005): "Interim Report of Presidential Panel on Contracts.

Joan. K (2005): "Estimating Techniques" PMI NETWORK. July 1996 Vol. X, No. 7.
Obiegbu, M. E (2004): "Documentation, Monitoring and Cost Analysis of Projects" Being a Paper Presented at 29th Annual Conference/General Meetings of the Nigerian Institute of Builders on Effective Management of Capital Projects in Nigeria.

Odunsami, K. T.& Onkwube, H. N. (2008). Factors affecting the accuracy of pre-tender cost estimate in Nigeria. *In the Construction, Building and Real Estate Research Conference of the Royal Institution of Chartered Surveyors. Held at Dubling Institute of Technology, 4-5 September 2008.*

Oforeh, F. C. & Alufohai, D. F. (2006): Management Estimating and Budgeting for Electrical Installation. Cosine Nig. Ltd.

Okoye, M. (2008) "Cash flow forecasting techniques and Control" Being a Paper Presented by at Seminar/Symposium on Quantity Surveying Practice in the New Millennium Organized by the National Association of Quantity Surveying Students (NAQSS) Federal Polytechnic Oko Chapter. Oct. 2008.

Okpala, D. C (1988). "Causes of High Cost of Construction in Nigeria" *Journal of Construction Engineering and Management.*

Olateju. K.A (2003): "Monitoring as a Management Tool to Avert Project

Osemenam, C.A. (2004): "Why Construction projects are Abandoned". The Nigerian Quantity Surveyor, Vol. 15 Page 16.

Project Management Institute (2004): A Guide to the Project Management Body of Knowledge.

Udoh, E. I. (2004): "Causes of Project Abortion and Abandonment" The Nigerian Quantity Surveyor, Vol 9, Page 11.

Ujene, A. O. Idoro, G. J & Mbamali I. (2013). Factors Influencing Direct Costs Dynamics of Building Projects – *Team members perception in Delta State, Nigeria*.