FAILURE EVALUATION OF ENGINEERING PROJECTS IN NIGERIA

(A CASE STUDY OF PIPELINE AND PRODUCT MARKETING COMPANY LIMITED, A SUBSIDIARY OF NIGERIAN NATIONAL PETROLEUM CORPORATION)

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A PROJECT SUBMITTED TO THE DEPARTMENT OF MECHANICAL ENGINEERING OF AHMADU BELLO UNIVERSITY ZARIA IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF MASTERS OF ENGINEERING MANAGEMENT.

MARCH, 2017

DECLARATION

I hereby declare that this research work entitled: Failure Evaluation of Engineering Projects in Nigeria (A case study of Pipeline and Product Marketing Company Limited a subsidiary of Nigerian National Petroleum Corporation)was carried out and composed by me under the supervision of Prof. D. S. Yawas.

This work has not been submitted in any form for the award of a degree or diploma at any institution. All sources of information and materials used in this project are acknowledged by means of references.

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CERTIFICATION

This is to certify that this research work titled "Failure Evaluation of Engineering Projects in Nigeria (A case study of Pipeline and Product Marketing Company Limited a subsidiary of Nigerian National Petroleum Corporation)"was carried out by **Zahraddeen Muhammad Babangida** with registration number P13EGME8028 under the supervision of **Prof. D. S. Yawas**.

The project is submitted in partial fulfilment of the requirements for the award of M.Sc Engineering Management at Ahmadu Bello University, Zaria.

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May Almighty God guide and protect us all.

Zahraddeen M. Babangida

DEDICATION

It is with genuine gratefulness and warmest regards that I dedicate this research to my loving sister Sakina Muhammad Babangida.

ABSTRACT

This study centres on Failure Evaluation of Engineering Projects in Nigeria, A case study of Pipeline and Product Marketing Company Limited (PPMC). The instrument used in this study is analysis of some randomly selected Projects and questionnaires administered to Professionals involved in the execution of projects in PPMC. The result of this study show that there is still no consensus among project Management experts on what constitute a project failure, some consider failure based on the four constraints of Project Management (Budget, Schedule, Scope and Quality) while others consider it based on stakeholders expectation. The research shows that based on the constraints of Project Management, 85% of the projects in PPMC failed within 2011-2015- It was discovered that 41% of the failed projects were due to schedule, 29% due to bad scoping, 18% due to budget and 12% due to quality. The research also shows that from stakeholders perspective, of the 40% failed Projects in PPMC within the years 2011-2015, it was also discovered that 38% failed due to budget, 37% due to bad scoping and 25% due to quality. It is recommended that employment of principle of adequate budgeting and timely milestone payment will go a long way in reducing Project Failure in PPMC.

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DEFINITION OF TERMS

NNPC- Nigerian National Petroleum Corporation

PPMC- Pipeline and Product Marketing Company Limited

PROMACON- Project Management Conference of Nigeria

ETSD- Engineering and Technical Services Department

CPM- Critical Path Method

PERT- Program Evaluation and Review Technique

WBS- Work Breakdown Structure

AACE- Association for the Advancement of Cost Engineering

PMI- Project Management Institute

PMBOK- Project Management Body of Knowledge

IPMA- International Project Management Association

CHAPTER ONE

1.0 INTRODUCTION

1.1 BACKGROUND OF THE STUDY

There is an age-old saying that says: “we can do anything we want, but we cannot do everything we want.” This is the classic conundrum that all firms face. Organizations across industries are challenged to deliver an increasing number of projects and programs, while maintaining flat (or decreasing) budgets and resources. In such an environment, only one outcome is possible project failure (Nokes, 2007).

Pipeline and Products Marketing Company (PPMC), as a company invests millions of Naira to projects, brings on board the services of international expatriates using local resources to meet the compelling demands of its projects, yet we have experienced a lot of project failure within the framework of the system.

To fully understand the nature of projects and why they fail, it is absolutely necessary to understand what a project is, its management, key elements and its successes.

A project is a temporary endeavour designed to produce a unique product, service or result with a defined beginning and end (usually time-constrained, and often constrained by funding or deliverables) undertaken to meet unique goals and objectives, typically to bring about beneficial change or added value (Oracle, 2011).

The temporary nature of projects stands in contrast with business as usual (or operations), which are repetitive, permanent, or semi-permanent functional activities to produce products or services. In practice, the management of these two systems is

often quite different, and as such requires the development of distinct technical skills and management strategies (Dinsmore, 2005; Cattani etal., 2011).

The Project Management Conference of Nigeria, PROMACON has advocated several times for the adoption of internationally proven best practices on Nigerian Projects including Projects in Pipeline and Products Marketing Company PPMC. The organization has committed huge resources to running troubleshoots on the major causes of failure of Nigerian Projects and has agreed that top on the list of factors is Institutional framework error. The Nigerian agencies and ministries are void of departments focused on ensuring projects success.

In PPMC and Nigeria in general, the implementation of modern project management tools, methods and techniques is still not well established, this results into failure of public institutions and their contractors in performing their duties concerning the budget, specifications and deadlines of the projects awarded. Studies have recognized social and political systems, cultural blocks and lack of financial support as barriers to successful project planning and execution in Nigerian public sector (OLATEJU etal, 2011). Project management experts in the country say policy instability, weak operating infrastructure, and poor legal and political framework are high on the list of reasons why many projects have failed in Nigeria.

1.2 PROBLEM STATEMENT

Failure of projects in Nigeria has been a recurring decima. There are many factors that have been identified to affect project success in Nigeria or can be stated to have been identified as the main causes of project failure. As it is stated above, policy

instability, weak operating infrastructure, and poor legal and political framework are high on the list of reasons why many projects have failed in Nigeria. The attendant effects are:

i. Abandonment of projects
ii. Variations in project cost
iii. Scope creep in projects
iv. Poor quality of projects

This research work is aimed at studying the causes of project failure, the problems associated with the failures and proffer solution to improving success of projects in PPMC.

1.3 THE PRESENT RESEARCH

This study is to assess the success rate of projects in Nigerian Establishments in general and Pipeline and Product Marketing Company Limited in particular with the view to improving them. This can be accomplished by studying the factors that causes the failure of the projects and make corrections or adjustments where necessary.

1.4 AIM AND OBJECTIVES

The aim of this research is to identify the causes of project failure in Pipeline and Product Marketing Company Limited (PPMC) and recommend ways of reducing project failures and improving project success in the establishment.

The specific objectives are to:

i. Assess the rate of failure of projects and their causes in the last five years in Pipeline and Product Marketing Company Limited (PPMC)

ii. Identify the causes of failure and abandonment of Engineering projects in PPMC

iii. Examine the failure mode criteria and warning signals so as to predict impending failure and abandonment of engineering projects in PPMC through subjective reasoning

iv. Study the contributory factors to success and failure in the implementation of Engineering projects by government consultants and professionals

v. Suggest workable solutions to forestall the future problems of failure and abandonment of projects in PPMC

1.5 SIGNIFICANCE OF THE STUDY

The study of project failures in Nigerian establishments will expose to some extent the causes of failure to project managers in Nigeria, to the Nigerian Government and to all Nigerians in general. Knowledge of the causes and remedies of project failure can be said to create awareness and improve the success of future projects in Nigeria. Most a times these causes are known by the project managers, but circumstances beyond them and government policies leaves them vulnerable to them.

The causes of project failures are similar anywhere and for all types of projects, although the solution may differ from one project to the other. This is because no two projects are the same and all projects come with their unique challenges. Knowing

the probable causes and putting in place the right control measures will minimise the chances of failure and improve the chances of success of the particular project.

This study will look at some projects in PPMC and analyse their failures and successes and suggest ways of improvement. If recommendations are adopted, it will contribute to improvement in success rate of projects in PPMC, NNPC and the Nigerian Government in general. The study will be based on practical application of the methods suggested and will look at original projects that have been undertaking by PPMC. This will make the recommendations more practical and more applicable to future projects.

1.6 SCOPE AND LIMITATIONS

This study will be limited to engineering projects undertaken by PPMC within the last 5 years (2011-2015). It will look at projects from Maintenance Department and Engineering and Technical Services Department (ETSD) the two departments concerned with engineering projects in PPMC.

This project is in no way aimed at exposing the lapses of individuals involved in the execution of projects nor is it aimed at praising individuals for their success. It is undertaken to identify causes of failure and recommend ways to improve them. Real projects are only used as a case study so as to obtain real data from real projects executed in PPMC. The study will look at Electrical, Instrument and Mechanical projects in PPMC within the period stated.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 PROJECT MANAGEMENT

2.1.1 DEFINITION OF PROJECT MANAGEMENT

Project management according to Abbasi and Al-Mharmah (2000) "is the art and science of planning, designing and managing work throughout all the phases of the project life cycle". It is also regarded as a system or process of planning, designing, scheduling, managing and controlling interconnected project activities in order to achieve specific objectives or goal within a specific time, budget and standards (Lewis, 2007; Olateju etal., 2011).

Project Management is an innovative Management practice that tends to achieve stated or specified objectives within specific time and budget limits through optimum use of resources (Stuckenbruck & Zomorrodian, 1987).

Project Management is the discipline of carefully projecting or planning, organizing, motivating and controlling resources to achieve specific goals and meet specific success criteria. The temporary nature of projects stands in contrast with business as usual (or operations), which are repetitive, permanent, or semi-permanent functional activities to produce products or services. In practice, the management of these two systems is often quite different, and as such requires the development of distinct technical skills and management strategies.

The primary challenge of project management is to achieve all of the project goals and objectives while honouring the preconceived constraints. The primary constraints are scope, time, quality and budget. The secondary and more ambitious challenge is to optimize the allocation of necessary inputs and integrate them to meet pre-defined objectives.

2.1.2 HISTORY OF PROJECT MANAGEMENT

Until 1900, civil engineering projects were generally managed by creative architects, engineers, and master builders themselves, for example Vitruvius, Christopher Wren (1632–1723), Thomas Telford (1757–1834) and Isambard Kingdom Brunel (1806–1859). It was in the 1950s that organizations started to systematically apply project management tools and techniques to complex engineering projects (Lock, 2007; Kwak & Carayannis, 2005).

As a discipline, project management developed from several fields of application including civil construction, engineering, and heavy defence activity. Two forefathers of project management are Henry Gantt, called the father of planning and control techniques, who is famous for his use of the Gantt chart as a project management tool (alternatively *Harmonogram* first proposed by Karol Adamiecki); and Henri Fayol for his creation of the five management functions that form the foundation of the body of knowledge associated with project and program management. Both Gantt and Fayol were students of Frederick Winslow Taylor's theories of scientific management. His work is the forerunner to modern project management tools

including work breakdown structure (WBS) and resource allocation (Cleland & Gareis, 2006;Marsh, 1975).

The 1950s marked the beginning of the modern project management era where core engineering fields come together to work as one. Project Management became recognized as a distinct discipline arising from the management discipline with engineering model. In the United States, prior to the 1950s, projects were managed on an ad-hoc basis, using mostly Gantt charts and informal techniques and tools. At that time, two mathematical project-scheduling models were developed. The "Critical Path Method" (CPM) was developed as a joint venture between DuPont Corporation and Remington Rand Corporation for managing plant maintenance projects. And the "Program Evaluation and Review Technique" or PERT, was developed by the United States Navy in conjunction with the Corporation and Booz Allen Hamilton as part of the Polaris missile submarine program (Stauber etal, 1959).

PERT and CPM are very similar in their approach but still present some differences. CPM is used for projects that assume deterministic activity times; the times at which each activity will be carried out are known. PERT, on the other hand, allows for stochastic activity times; the times at which each activity will be carried out are uncertain or varied. Because of this core difference, CPM and PERT are used in different contexts. These mathematical techniques quickly spread into many private enterprises.

At the same time, as project-scheduling models were being developed, technology for project cost estimating, cost management, and engineering economics was evolving,

with pioneering work by Hans Lang and others. In 1956, the American Association of Cost Engineers (now AACE International; the Association for the Advancement of Cost Engineering) was formed by early practitioners of project management and the associated specialties of planning and scheduling, cost estimating, and cost/schedule control (project control). AACE continued its pioneering work and in 2006 released the first integrated process for portfolio, program and project management (Total Cost Management Framework). The International Project Management Association (IPMA) was founded in Europe in 1967, as a federation of several national project management associations. IPMA maintains its federal structure today and now includes member associations on every continent except Antarctica. IPMA offers a Four Level Certification program based on the IPMA Competence Baseline (ICB). The ICB covers technical, contextual, and behavioural competencies. In 1969, the Project Management Institute (PMI) was formed in the USA. PMI publishes A Guide to the Project Management Body of Knowledge (PMBOK Guide), which describes project management practices that are common to "most projects, most of the time." PMI also offers multiple certifications (Kousholt, 2007;Harrison & Dennis, 2004).

2.1.3 PROJECT MANAGEMENT PROCESSES

Traditionally, project management includes a number of elements: four to five process groups, and a control system. Regardless of the methodology or terminology used, the same basic project management processes will be used. Major process groups generally include:

i. Initiation

ii. Planning

iii. Production or execution

iv. Monitoring and controlling

v. Closing

In project environments with a significant exploratory element (e.g., research and development), these stages may be supplemented with decision points (go/no go decisions) at which the project's continuation is debated and decided.

2.1.3.1 INITIATION

This first stage of a project defines the business case, the justification for the project, which will be used to ensure the project stays on track. It also states what the project is intended to achieve, how that will be achieved and the scope of the work; this is important for controlling subsequent change requests. In this phase, those involved in the project will be assigned their responsibilities.

The initiating processes determine the nature and scope of the project. If this stage is not performed well, it is unlikely that the project will be successful in meeting the business' needs. The key project controls needed here are an understanding of the business environment and making sure that all necessary controls are incorporated into the project. Any deficiencies should be reported and a recommendation should be made to fix them (Nathan & Jones, 2003).

The initiating stage should include a plan that encompasses the following areas:

i. Analyzing the business needs/requirements in measurable goals

ii. Reviewing of the current operations

iii. Financial analysis of the costs and benefits including a budget

iv. Stakeholder analysis, including users, and support personnel for the project

v. Project charter including costs, tasks, deliverables, and schedules

2.1.3.2 PLANNING

The project plan includes details about how the project work will be carried out, how it will be monitored and controlled, how communication will be facilitated and information about costs and timescales. But once a project is underway it is typically the project schedule where most attention is focused. All tasks need to be scheduled in the most efficient order to ensure tasks with inter-dependencies are completed when required and to enable several tasks to be performed in parallel. There are many project management tools available to assist with scheduling, one of the most common being the Gantt Chart.

After the initiation stage, the project is planned to an appropriate level of detail. The main purpose is to plan time, cost and resources adequately to estimate the work needed and to effectively manage risk during project execution. As with the Initiation process, failure to adequately plan greatly reduces the project's chances of successfully accomplishing its goals (Nathan & Jones, 2003).

Project planning generally consists of

i. Determining how to plan;

ii. Developing the scope statement;

iii. Selecting the planning team;

iv. Identifying deliverables and creating the work breakdown structure;

v. Identifying the activities needed to complete those deliverables and networking the activities in their logical sequence;

vi. Estimating the resource requirements for the activities;

vii. Estimating time and cost for activities;

viii. Developing the schedule;

ix. Developing the budget;

x. Risk planning;

xi. Gaining formal approval to begin work.

Additional processes, such as planning for communications and for scope management, identifying roles and responsibilities, determining what to purchase for the project and holding a kick-off meeting are also generally advisable.

2.1.3.3 EXECUTION

The person or group assigned to carry out a task will need to know, in detail, what the task involves as well as any dependencies and timescales, and will also need to understand the criteria by which each task is deemed complete (Nathan & Jones, 2003).

2.1.3.4 MONITORING AND CONTROL

Planning is carried out in the early stages of a project but there should be ongoing monitoring to ensure the project remains on budget and schedule; that resources are available and the expected benefits can be delivered. Estimates, deadlines and milestones may need to be altered as the project progresses.

No project is without problems but the project manager needs to control them so they do not adversely affect the end result. The control phase also deals with risk management.

Monitoring and controlling consists of those processes performed to observe project execution so that potential problems can be identified in a timely manner and corrective action can be taken, when necessary, to control the execution of the project. The key benefit is that project performance is observed and measured regularly to identify variances from the project management plan.

Monitoring and controlling includes:

i. Measuring the ongoing project activities ('where we are');

ii. Monitoring the project variables (cost, effort, scope, etc.) against the project management plan and the project performance baseline (*where we should be*);

iii. Identify corrective actions to address issues and risks properly (*How can we get on track again*);

iv. Influencing the factors that could circumvent integrated change control so only approved changes are implemented.

In multi-phase projects, the monitoring and control process also provides feedback between project phases, in order to implement corrective or preventive actions to bring the project into compliance with the project management plan.

Over the course of any project, the work scope may change. Change is a normal and expected part of the process. Changes can be the result of necessary design modifications, differing conditions, material availability, contractor-requested changes, value engineering and impacts from third parties, to name a few. Beyond executing the change in the project, the change normally needs to be documented to show what was actually done. This is referred to as change management. Hence, the owner usually requires a final record to show all changes or, more specifically, any change that modifies the tangible portions of the finished work. The record is made on the contract documents – usually, but not necessarily limited to, the design drawings.

When changes are introduced to the project, the viability of the project has to be re-assessed. It is important not to lose sight of the initial goals and targets of the projects. When the changes accumulate, the forecasted result may not justify the original proposed investment in the project. Successful project management identifies these components, and tracks and monitors progress so as to stay within time and budget frames already outlined at the commencement of the project.

2.1.3.5 CLOSURE

Once there is an approved end product the project can be formally closed and a final review held to learn from both the successes and the mistakes and take that experience forward to the next project.

Closing includes the formal acceptance of the project and the ending thereof. Administrative activities include the archiving of the files and documenting lessons learned.

This phase consists of:

i. Contract closure: Complete and settle each contract (including the resolution of any open items) and close each contract applicable to the project or project phase.

ii. Project close: Finalize all activities across all of the process groups to formally close the project or a project phase

Also included in this phase is the Post Implementation Review. This is a vital phase of the project for the project team to learn from experiences and apply to future projects. Normally a Post Implementation Review consists of looking at things that went well and analysing things that went badly on the project to come up with lessons learned (PMI, 2010).

2.1.4 PROJECT MANAGER

First and foremost, Project Management is a team sport, and in today's modern society it relies on the principal players of the team taking responsibility and

accountability for those aspects of the project they have been charged with. Indeed, this ethos should be passed down to all team members irrespective of their level of involvement in the project. All teams need a leader, our view is that this is the principal role of the one commonly referred to as the *'Project Manager'*.

A Project Manager is the person who has the responsibility for the successful initiation, planning, design, execution, monitoring, controlling and closure of a project. The Project Manager's role is arguably the most challenging of roles within the project team. As the project progresses through its various stages, Project Manager's must be able to adapt themselves to the changing demands of the project and the team. Many organisations and project sponsors set their projects up to fail because they do not fully recognise how important the project management role is to successfully manage a project through its life cycle.

2.1.4.1 THE PROJECT MANAGER'S ROLE

We think of the Project Manager's role consisting of 3 dimensions:

1. Technical
2. Transactional
3. Transformational

The Technical dimension, covers the more 'hands-on' role of the Project Manager. The Project Manager must be able to, and be prepared to get their sleeves rolled up and get stuck into technical issues at a detailed level. Generally, this is more so during the earlier project definition stages of the cycle. The project Team is usually at its leanest, and all members have to get involved in progressing the detail of technical

issues, or the project will stall. "The Devil is in the Detail" most have heard that expression and it's 100% true when it comes to projects. Take your eye off an understanding of the detail at your peril! That is to say the project manager absolutely does not need to know how to do everyone's tasks within the project, but needs to appreciate all the processes being carried out and be able to confidently challenge others at a level of informed understanding. The Technical aspects of the project management role would include those activities needed to develop and complete the project definition, and then to implement the project in accordance with its implementation plan, controlling the project assuring the required quality of delivery. Being a team sport, the project management role is not necessarily the same thing as the Project Manager's role (Holland, 2010).

For the Project Manager, depending on the size of the project, the role could include managing a team of Project Managers to deliver these technical aspects, or more commonly, initially carrying out a significant portion of the technical project management aspects.

The Transactional Dimension refers to the traditional project management activities associated with managing the project's work flows and performance. Such activities would initially include establishing the project baseline metrics and parameters required to control the project during the implementation stage. During the project implementation stage Transactional activities would include all those project management control and reporting activities carried out regularly, needed to

demonstrate control of the project. Here the Project Manager is performing foremost as a 'Manager' (Holland, 2010).

The Transformational Dimension refers to activities associated with leadership. Here the Project Manager is acting as the Project Leader. Softer people, relationship and communication skills need to be put to work, seeking to get the best performance from the Project Team.

This is where we believe Project Managers should be at their most effective. The project is delivered by the Team, and therefore regular ongoing Team maintenance, development and motivation are essential activities if the project is to be successful. This is where the best Project Managers spend the majority of their time; they realise that the performance return from their effort invested in the Team and individuals vastly increases the chances of success.

Project Managers who grasp a project with passion, and who create a sustainable buzz about the project create an environment where people feel they must be part of the Project Team, and who end up talking about being part of the project many years after its completion (Holland, 2010).

2.1.4.2 PROJECT MANAGER'S RESPONSIBILITIES

The Project Manager's KEY responsibility has to be successfully delivering the objectives and benefits the sponsor expects of the project, or the project stage the Project Manager is assigned to.

All other day to day responsibilities feed into the KEY one. The following is a non-exhaustive list of responsibilities often referred to in a Project Manager's Role and Responsibility brief (Holland, 2010):

Ensure the following are carried out in accordance with the defined expectations:

i. Progress - deliverables are being completed within the base lined time scales

ii. Cost - deliverables are being completed within the base lined cost plan

iii. Quality - deliverables are being completed to defined expectations, first time

iv. Performance (Value) - progress is being earned for the expected cost

v. Cash flow - net project cash flow is being achieved as the defined expectations

vi. SHE - the required Safety, Health & Environmental standards are being achieved

vii. Regulatory - all required statutory and regulatory conditions are being met

viii. Reporting - regular and timely reporting of project progress to the sponsors

ix. Risk - to proactively manage foreseen project risk, mitigating as necessary

x. Change - managing changes to the project without unduly affecting the stated objectives and benefits

The list can go on and on. Though it is worth noting that in addition to all the above there are additional implied responsibilities that directly affect those stated above. For example: Positive Team management - is an implied responsibility. If the Team

is not led effectively, then progress, performance, quality etc will begin to suffer (Holland, 2010).

2.1.5 REASONS FOR PROJECT FAILURES

Most organizations have experienced projects that did not end on time, were over budget, or changed in scope over time. There are many pitfalls that can sink projects. Here we will focus on four basic reasons why projects fail. Because most project teams are comprised of at least three sets of players including Executive Management, Project Managers, and Team Members or resources, we will take a look at each issue from all three vantage points, and then provide suggested solutions.

2.1.5.1 LACK OF VISIBILITY OF ALL PROJECTS

A common reason why projects fail is related to visibility. All three tiers of the project team, Executive Management, Project Managers, and Team Members, need access to the right level of information at the right time.

Executives often complain that they do not have visibility into all current enterprise projects. They often do not have access to the project schedules in real-time. Sometimes Project Managers present the plan at the outset of the project, then become gatekeepers of the schedule, claiming to executives that the schedule has not been updated recently and is not ready to be shared. The sponsors of a project and the executives do not have access to a schedule or reports until it is too late to either re-direct the effort or to cancel the project. The net result that management cares about is the cost of the schedule overruns to the company.

Project Managers often put together a schedule and plan at the outset of a project. The schedule does not always get updated for a variety of reasons. The Project Managers are so preoccupied with managing issues and re-organizing resources that they do not have time to update the tasks on the schedule and review their impacts.

In fast paced environments, Project Managers are asked to work on several projects at one time. Many Project Managers attempt to keep pace with the task updates on their project schedules. Those that do, end up acting as 'glorified administrators,' spending a lot of time asking resources about task progress.

Project Managers often lack visibility into all of the projects their resources are working on. Many times they share team members with other Project Managers, so they may not know exactly what tasks the resource is working on that day.

The most frequently heard complaint from team members is that they lack visibility on a day to day basis about the tasks that they are supposed to work on. If they are working on multiple projects at one time, they are often confused about task priority (West, 1997).

The best solutions are a combination of tools, process, and people-based changes. The tool portion of this solution is to provide the team with a centralized location for publishing all project schedules. The simplest way to share project schedules is to post project files in a network folder, setting permissions on the folders using Windows folder and group permissions for access rights.

A better solution is to push projects and corresponding documents to Share Point, or other intranet or extranet solution, again setting access rights. The best tool for the job is to provide a complete enterprise project management solution where all projects are centralized in one database. If the team uses a web based system, then project information may be accessed from remote if team members travel, work from remotely, or need to update information from client offices (West, 1997).

The process part of the solution is to empower team members to update their own tasks in the centralized system. Obviously there are some serious limitations to this if the team is simply posting information on the network, versioning being the biggest issue. However, if an enterprise, web-based project management solution is used, then team members may update their own tasks and the information is presented in real-time. This relieves the project manager from the administrative aspect of getting task updates from team members. It also has the effect of pushing the work to the appropriate level that is, to the person actually performing the work. In addition, the executive management team has real-time visibility into all projects, their percentage complete, actual hours spent and the financial impact.

The success of the implementation involves executive management. Executives must communicate to all team members the importance of updating tasks and projects on a daily basis. The leadership of top management cannot be minimized. With Project Insight implementations, we have found through experience that the most successful teams are those whose leadership team has reinforced the request for team member and project manager updates through incorporating the behaviour change in

performance evaluations and other measurement drivers. If the executive leadership is lacking, then any attempt to change behaviour through implementing process changes and software solutions will ultimately fail (West, 1997).

2.1.5.2 UNCLEAR PROJECT OBJECTIVES

Most organizations have more opportunities and project initiatives than they can ever hope to fulfil. Many companies embark upon more initiatives than they probably should, causing over worked and often unhappy team members.

Executives play a key role in this issue. Some organizations have not adequately defined their goals and strategies. If top management is not clear on project priorities, then it follows that the entire organization is also unclear about which projects are the most important. Many organizations get so busy that they forget a key component of success is taking the time out to meet and discuss goals and strategies to reach those goals. Once these elements are outlined, many projects are eliminated for not matching up to those goals (West, 1997).

Many times, project managers are given so many projects that they cannot realistically achieve them on time and on budget. Some of the more experienced project managers may push back, telling management that all efforts cannot be achieved. However, many project managers do not, either in fear of losing their jobs, or not wanting to 'rock the boat.' The lack of vision and leadership at the top of the organization flows downward so that project managers are managing more projects than they should.

The natural result of this lack of prioritization is that team members are often over worked. Eventually, some may leave the organization seeking a less hectic environment.

It is the role of executive management to determine the organization's long term goals and the strategies for attaining those goals. Once these goals are clearly defined, then project initiatives may be weighed against these goals. So if a project initiative does not fit the long or short terms goals of an organization, it should not be embarked upon. Then, the remaining projects may be ranked in order of priority.

Some of the largest and most sophisticated corporations have risk assessment departments whose sole role is to evaluate all the possible opportunities of the organization and determine which initiatives have the most revenue potential. However, not all companies have risk assessment departments. In fact, mid-market players do not have these separate risk organizations. Therefore, it is even more important that executives step up to evaluate and rank project priorities. Then management must clearly communicate these priorities to project managers and team members. A simple numeric ordering system may be used.

Project managers should be consulted when weighing these initiatives, as project managers have insight into the risks involved with different projects. This is particularly important for mid-market companies which do not have separate risk assessment managers. They must use the resources at hand. Project managers must then embark upon the projects with the highest priority levels.

At a minimum, the project priorities must be communicated in status meetings and reiterated frequently. If a project management solution is utilized, then the project priority should also be designated in that solution as a visible reminder all team members (West, 1997).

2.1.5.3 NO VISIBILITY INTO RESOURCE WORKLOAD

Following the lack of prioritization are usually overloaded resources. It is a circular problem as well. That is, because executive management has no visibility into all of the projects and tasks the team is performing, they are often labouring under the belief that the organization can achieve more than it is capable of in terms of sheer workload.

Executive managers often delegate the assignment or allocation of resources to resource managers and project managers. If project priorities are not clearly established, then it is highly likely that the organization will embark upon too many projects at one time. The result is that the average team member will have more work than time in the work day to complete that work.

Project managers often state that executive management has no idea how much work their resources actually have assigned to them. Unless the project managers are willing to stand up to executive management, or have a way to show that their resources are overloaded. They are in trouble.

The average team member is the most impacted by the lack of visibility into the workload, as he or she is asked to work extended hours in order to attempt to fulfil

the many projects, tasks, and objectives. However, the result is an over worked, burned out employee that may ultimately look for work elsewhere (West, 1997).

Project Management Institute, (PMI) Inc. holds that if an employee works an eight hour work day, then the resource should not be assigned more than six hours of work. This allows the employee two hours for the administrative aspects of his or her position. So, the first part of the solution has to be executive management understanding this concept and committing to invoke a corporate culture of planning and managing resources effectively. If the organization is simply committed to 'working on whatever is on fire', then nothing will change.

There are many ways to uncover what resources are working on and when. The simplest tool is to use a white board with a daily grid displaying the task being performed and the team member that is working on that task. For some fast paced environments, this solution may work well. Of course, there has to be a point person to manage the white board.

Many project teams use Excel spreadsheets to outline the tasks and the team members working on those tasks. Again, usually there is one point person, as Excel is not a collaborative solution and should have an owner. This can be cumbersome for organizations with multiple projects.

More sophisticated teams benefit from using a centralized resource management and allocation software solution. These solutions allow projects, tasks, and resources to be input while in planning stage. Then the workload of each resource may be viewed in a graphical report, giving resource managers, project managers, and executives the

ability to see the total workload. Once the total workload is assessed, choices may be made about which projects to delay, or which projects to assign additional resources to, and the like. Without insight into the actual workload of the entire team, chaos is likely to reign, rather than a thoughtful, planning culture (West, 1997).

2.1.5.4 GAPS IN COMMUNICATION

Once a project is in full swing, a common issue is communication. Most project teams use email to communicate about their projects and tasks. The biggest complaint here is that project communication resides in each individual's email box. So, if a new resource joins the project, there is no centralized view of the project history.

Executive managers usually rely on weekly or monthly status reports from project managers for project status. This leaves the information about the projects in the hands of the project manager. Some executives have complained that project managers hold the communication 'hostage.' As project sponsors, there is no reason why executives should not have access to the project dialogue.

The use of groups in email is very common. Project managers may email an entire group a communication about a project. The issue comes up with the responses when some team members forget to click on 'reply to all' and some team members do not receive the email or communication, yet the assumption is that all team members have been looped in.

Team members complain about the volume of emails they receive and the burden of sorting through the emails, finding those that are most relevant to them. This practice

wastes a lot of valuable time that they could be working on tasks, instead they are sifting through emails.

At a bare minimum, communication should be posted in a centralized location. The lowest common denominator seems to be the organization's network. The purpose of centralizing the project communication is so that if new resources join the effort mid-stream, they can get up to speed rapidly by reviewing the entire project history.

The better solutions are the web based collaborative and project systems that provide a centralized location for project and task communication. This software solves the issue by posting all relevant project information in one place.

For project teams with client facing projects, centralized communication helps to resolve questions and issues that arise on projects and tasks. The communication may be referred to for clarification of scope, goals, and other key decisions made during the project. For teams that must comply with FDA or other regulatory bodies, maintaining all of the project communication in one place is imperative. Project teams might as well get serious about providing a solution to this issue.

Solutions to these common issues are a combination of people, processes and tools. There is no 'magic button.' Good processes should be implemented that are customized for the business. If outside consultants need to be hired to help define these processes, then they should be brought on board. Software solutions that support these processes need to be utilized or invested in. Once invested in, the solutions need to be supported by top management.

Executive management must show leadership by spending the time it takes to plan, set goals and strategies, prior to embarking on projects. Project managers must be bold enough to contribute and give feedback when executives' expectations are unrealistic. Team members must get on board once projects have begun and task assignments have been communicated (West, 1997).

2.2 THEORETICAL FRAMEWORK

In a perfect world every project would be "on time and within budget." But reality (especially the proven statistics) tells a very different story. It is not uncommon for projects to fail. Even if the budget and schedule are met, one must ask "did the project deliver the results and quality we expected?" True project success must be evaluated on all constraints of Project Management. Otherwise, a project could be considered a "failure." These constraints are:

1. Time (Schedule)
2. Budget (Money)
3. Scope
4. Quality

Have you ever seen a situation where projects begin to show signs of disorganization, appear out of control, and have a sense of doom and failure? Have you witnessed settings where everyone works in a silo and no one seems to know what the other team member is doing? What about team members who live by the creed "I will do my part (as I see fit) and after that, it is their problem." Even worse is when team members resort to finger-pointing. Situations similar to these scenarios point to a sign

that reads "danger." And if you read the fine print under the word "danger" it reads, "your project needs to be brought under control or else it could fail."

When projects begin to show signs of stress and failure, everyone looks to the Project Manager for answers. It may seem unfair that the burden of doom falls upon a single individual. But this is the reason why you chose to manage projects for a living! You have been trained to recognize and deal with these types of situations.

There are many reasons why projects (both simple and complex) fail; the number of reasons can be infinite. However, if we apply the 80/20 rule the most common reasons for failure can be found in the following list (Carlos, 2011):

i. Poor management
ii. Lack of solid project plan
iii. Centralized proactive management initiatives to combat project risk
iv. Poorly defined roles and responsibilities
v. Team weaknesses
vi. Poor communication
vii. Overruns of schedule and cost
viii. Scope creep
ix. Ignoring project warning signs

Even with the best of intentions or solid plans, project can go awry if they are not managed properly. All too often, mishaps can occur (and usually do). This is when the project manager must recognize a warning sign and take action. If you understand the difference between symptoms and problems and can spot warning signs of project

failure, your training will help you take steps to right the ship before it keels over. Yes, it is the Project Manager's responsibility to correct the listing no one else. In addition to applying the processes and principles taught in project management class, you can also use your personal work skills of communication, management, leadership, conflict resolution, and diplomacy to take corrective action.

During the course of managing a project, the Project Manager must monitor activities (and distractions) from many sources and directions. Complacency can easily set in. When this happens, the process of "monitoring" breaks down. This is why the Project Manager must remain in control of a project and be aware of any activity which presents a risk of project failure.

2.3 BRIEF ON PPMC

PPMC was set up as a subsidiary and strategic business unit of the Nigerian National Petroleum Corporation (NNPC). PPMC is run in conformity with the management culture of total quality in pursuant to the directive of the parent corporation the Nigerian National Petroleum Corporation (NNPC).

Its mission is; to ensure security of supply of petroleum products to the domestic market at low operating costs, market special products competitively in the domestic and international markets, provide excellent customer service by effectively and efficiently transporting crude oil to the refineries and moving petroleum products to the market.

2.3.1 MISSION

To supply petroleum products to the domestic market at minimal operating costs.

To provide excellent customer service by efficiently transporting crude oil to the refineries and moving petroleum products to the market.

To market special products competitively in the domestic and international markets.

2.3.2 VISION

PPMC will be the dominant supplier of refined petroleum products to the existing domestic and growing export markets within West African sub-region.

2.3.3 OPERATIONAL STRUCTURE

PPMC is structured to operate under a Board of Directors headed by a non-executive Chairman. The Company is daily managed by a Chief Executive Officer, the Managing Director who is assisted by four Executive Directors namely; Executive Director Operations, Executive Director Services, Executive Director Commercial and Executive Director Finance and Accounts.

2.3.4 MODE OF OPERATION

PPMC receives crude oil from the NNPC Corporate Services Unit called National Petroleum Investments Management Services (NAPIMS). PPMC then supplies the crude oil to the NNPC local refineries. However, petroleum products are sometimes imported to supplement local production when the local refineries are unable to process enough for the country's needs.

Petroleum products which are either imported or refined locally are received by PPMC through import jetties or refinery depots and distributed through pipelines to

depots strategically located all over the country from where petroleum tankers lift the products to designated retail outlets (Filling stations).

2.3.5 THE PRODUCTS PIPELINES AND DEPOTS SYSTEMS

The company's main assignment is executed using a network of Petroleum Products Pipelines and Storage depots strategically located nationwide. The products pipelines have a total length of 5120 kilometres. The products are moved through the pipelines by pumping using mainline and booster pumps. A number of pump stations complement pumping of products to desired destinations.

The pipelines and storage depot system along with its mainline and booster pump stations and export/import facilities are administered under five zones known as Operations Areas. Each operation area has as administrative office located within the area under its control and is headed by an Area Manager, who reports directly to the Executive Director Operations. The depots and Jetties are controlled by the Area Offices. The five Area Offices are:

1) Warri
2) Port Harcourt
3) Mosimi
4) Kaduna
5) Gombe

2.3.6 MARINE MOVEMENT

PPMC operates a fleet of marine vessels used for moving products along Nigeria's coastal water – from Port Harcourt and Warri to Lagos and from Port-Harcourt to

Calabar. These are vessels of varying capacities. There are also LPG vessels in the fleet. Products moved into Lagos through the coastal vessels are discharged primarily at the Atlas Cove Terminal where they are received into storage tanks for onward pumping to Mosimi depot near Sagamu in Ogun State from where the products are pumped to other depots in that axis such Ibadan, Ilorin and Ore. Also there is throughput agreement with some private depot owners for use of their storage tanks and load out facilities for product reception and distribution.

Other vessels are dedicated to the evacuation of fuel oils from Port-Harcourt and Warri refineries for export. Calabar depot can only be supplied products by marine vessels as it is not linked by the pipeline network. LPG vessels discharge directly into the markets' and PPMC storage facilities at Apapa.

2.3.7 TYPES OF PROJECTS HANDLED BY PPMC

There are different projects undertaken and handled by PPMC. These include:

1) Tank Construction and Maintenance
2) Pipeline Construction and Maintenance
3) Equipment Maintenance and Upgrade
4) Installation and Maintenance of Petroleum Trucks Loading Facilities
5) Installation and Maintenance of Diesel and Electric Pumps for Pipeline Operations
6) High voltage/Medium voltage Electrical Installations

2.4 REVIEW OF RELATED PAST WORKS/ STUDIES

Iyer and Jha (2005) identified project performance factors to include: project manager's competence, top management support, project manager's coordination and leadership skill, monitoring and feedback by the participants, coordination among project participants and owners competence and favourable climatic condition. However They identified conflict among project participants, ignorance and lack of knowledge, presence of poor project specific attributes and non-existence of cooperation, hostile socio economic and climatic condition, reluctance in timely decision, aggressive competition at tender stage, and short bid preparation time as the factors adversely affecting the performances of projects. Their further analysis indicates coordination among project participants as the most significant of all the factors having maximum positive influence on cost performance.

Zuofa and Ochieng (2014), studied project failures in Nigeria and in their findings affirmed that like in other climes, there is still a lack of consensus on the concept of project failure and success among project management practitioners in Nigeria. Specifically, it recognised that practitioners perceived project failure based on a variety of factors that exceed the inability to execute and deliver projects within defined cost, time or scope. The broad implication of this is that an in-depth understanding of project failure can only emerge from the activities undertaken during the lifecycle of projects and based on stakeholder definitions and criteria. However, it is worth noting that based on the consensus views, corruption, lack of professionalism, inexperienced project managers and project personnel, bureaucratic procurement process were identified as the major causes of project failure in Nigeria.

The findings also highlighted the need for the introduction of governance mechanisms which integrate processes and guidelines that support projects to achieve their organisational objectives. Additionally, it was proposed that punitive actions should be enforced against erring project personnel who engage in corrupt and unethical practices.

Faniran etal, (1999) reported that the problems affecting the successful performance of projects in developing countries can be overcome or significantly reduced by effectively managing the front-end activities of the project delivery process. The main front-end project processes that have been found in previous studies to significantly affect project performance are the project definition and project planning phases. These processes involve identifying project stakeholder needs, defining solutions for addressing the identified needs, and developing sufficiently detailed plans that describe the modalities (i.e. 'how') for implementing a project. The upstream investment of adequate resources in the organization and management of front end provides a solid foundation for downstream project success. This is particularly relevant in developing countries where the project environment is often characterised by uncertainty and unpredictability.

Diugwu etal, (2015) highlighted the role of projects in stimulating economic development, and identified some factors that militate against successful completion of projects. Using specific examples from Nigeria, it established a link between these project failures and non-adherence to project management principles. Based on this, it then suggested that good project conception and definition, proper cost and budget

management, adequate stakeholder management, and the appointment of a competent project manager would go a long way in addressing the problems associated with delivery of public sector funded infrastructural projects in Nigeria.

From the above review, it can be seen that not much work has been done on Failure Evaluation of Engineering Projects in Nigeria.

CHAPTER THREE

3.0 RESEARCH METHODOLOGY

3.1 INTRODUCTION

Research methodology is a way to systematically solve the research problem. Choosing an appropriate research methodology and research method are two different things. Therefore, the clarity of these two terminologies is essential for the purpose of this study. Research "methods" usually refers to specific activities designed to generate data (eg. Questionnaires, interviews, focus groups, observation) and research "methodology" is more about your attitude to and your understanding of research and the strategy or approach you choose to answer research questions (Greener & Martelli, 2008).

3.2 RESEARCH DESIGN

The term research design refers to researcher adoption of a procedural plan to answer questions on validity, accurately and objectively. This chapter describes the research design applied for the conduction of this study. it further examines the purpose of the study, the techniques used to conduct the research, the data collection methods and the data analysis process. Furthermore, justification of each choice is included in order for the research design to be supported.

The research has been through the following research design stages to ensure the research aims and objectives are achieved.

3.2.1 POPULATION OF THE STUDY

The population for this research consists of a large number of Project Engineers, Project Consultants, contractors, Project Managers, Project Owners and administrators. The research was focused on a small sample of this large group of people to generalize the result.

Selecting the targeted sample is a fundamental element in any research; clear identification and misidentification of the targeted sample has its advantages and disadvantages. However, it is impracticable to survey the entire population to answer the research questions, which involves difficulties in gaining access to all the samples and extended time of data collection and analysis. On the other hand, it seems obvious that the smaller and more sizeable the target sample is, the more likely the research will be practical, cheaper and save time in terms of data collection and analysis. Therefore, the targeted sample has to be clearly identified and chosen so as to achieve the required findings and results.

Based on the above, questionnaires were sent to randomly selected stakeholders in the industry, they include mainly site engineers/office engineers, Project Managers, Project Team Members, Project Supervisors, Project Consultants and Contractors at the top of their careers and who have had immense experience on Engineering Projects. Fifty (50)questionnaires were distributed as follows, twenty (20) to Engineers within PPMC that have served in one capacity or the other in PPMC projects within the last five years, ten (10) to consultants and twenty (20) to

contractors. Rate of response will be discussed in the next chapter with analysis of results.

3.2.2 DATA GATHERING TECHNIQUES

Data collection is the process of gathering and measuring required information for each selected unit in the survey of interest, in an established systematic fashion that enables one to answer stated research questions, test hypotheses and evaluate outcomes. The main point in data collection is gathering useful, efficient and related data to quality problems.

The primary data used for the study was obtained from Engineers involved in projects, projects Managers, Contractors and some stakeholders involved in monitoring and evaluation of PPMC projects.

3.2.3 INSTRUMENTATION

Questionnaire was used as an instrument of data collection with the aim of collecting information about project failures, their causes and application of project management practices. Relevant statistical analysis was conducted on the collected data to explore different issues of this research. The questionnaire was filled out by these people who are involved every day in projects. This method will enhance data accuracy and seriousness, it may also account for over 75% response rate in the data collection. The questionnaire was designed from review of related literature to the study.

An evaluation of factors affecting the performance of the questionnaire for the study is made up of two main sections. Section A was used to collect personal data of

respondents, section B was used to identify eighteen (18)factors believed to affect project performance. The respondents were asked to indicate, based on their local experience the level of importance of each one of the identified eighteen (18) factors of performance on a five-point Likert scale as: one (1) Strongly Disagree, two (2) Disagree, three (3) Indifferent, four (4) Agree and five (5) Strongly Agree. The main groups considered in this paper are: time, cost, quality, productivity, client satisfaction, regular and community satisfaction, people, health and safety, innovation and learning, and environment.

3.3 LINKERT SCALE

The Likert Scale is an ordinal psychometric measurement of attitudes, beliefs and opinions. In each question, a statement is presented in which a respondent must indicate a degree of agreement or disagreement in a multiple choice type format.

The advantageous side of the Likert Scale is that they are the most universal method for survey collection, therefore they are easily understood. The responses are easily quantifiable and subjective to computation of some mathematical analysis. Since it does not require the participant to provide a simple and concrete yes or no answer, it does not force the participant to take a stand on a particular topic, but allows them to respond in a degree of agreement; this makes question answering easier on the respondent. Also, the responses presented accommodate neutral or undecided feelings of participants. These responses are very easy to code when accumulating data since a single number represents the participant's response. Likert surveys are also quick,

efficient and inexpensive methods for data collection. They have high versatility and can be sent out through mail, over the internet, or given in person.

There are advantages and disadvantages to every type of research, and they are quite clear with this type. Another notable advantage of Likert Scale questions is that it is easy to draw conclusions, reports, results and graphs from the responses. Once all responses have been received, it is very easy to analyse them. Last but not least, it is very quick and easy to run this type of survey and it can be sent out through all modes of communication, including even text messages.

However, the problem with Likert Scale questions is that they are uni-dimensional. Because they only give a certain amount of choices, it would imply the space between each possibility is equidistant, which is not true in real life. As a result, a true attitude is not actually measured. Furthermore, you must realise that your previous questions will have influenced responses to any further questions that have been asked. People also have a tendency to automatically avoid “extremes”, therefore answering the way they think they are expected to, rather than providing real honesty. However, Likert Scale is positive overall, particularly if you understand the limitations it presents. By knowing that it is by no means a perfect tool, you are able to read data less as set in stone, but more as a generalised picture of a certain issue, which can be all you need for improvement.

CHAPTER FOUR

4.0 DATA PRESENTATION AND ANALYSIS

4.1 INTRODUCTION

This chapter of the research presents the data, analysis of the data and discussion of results obtained. Some real reports from past projects of PPMC are discussed, rate of failure of such projects determined based on factors identified. The questionnaires distributed and responses are also discussed and results compiled.

4.2 SOME MAJOR PROJECTS HANDLED BY PPMC BETWEEN 2010-2015

Table in appendix 1, indicates twenty (20) major projects handled by PPMC over the last five years, their status and remarks. Graphical analysis is shown in figures 1 to 4.

4.2.1 ANALYSIS OF THE PROJECTS

Considering the triple constraints of projects, 85% are considered failure and 15% success (see fig 4.1). Reason for the failure is divided and shown graphically in fig 4.2- with projects not finished on time contributing to 35% of the failed, bad scope contributes 29%, budget, quality, combination of budget and time contributes 12% each for the failure.

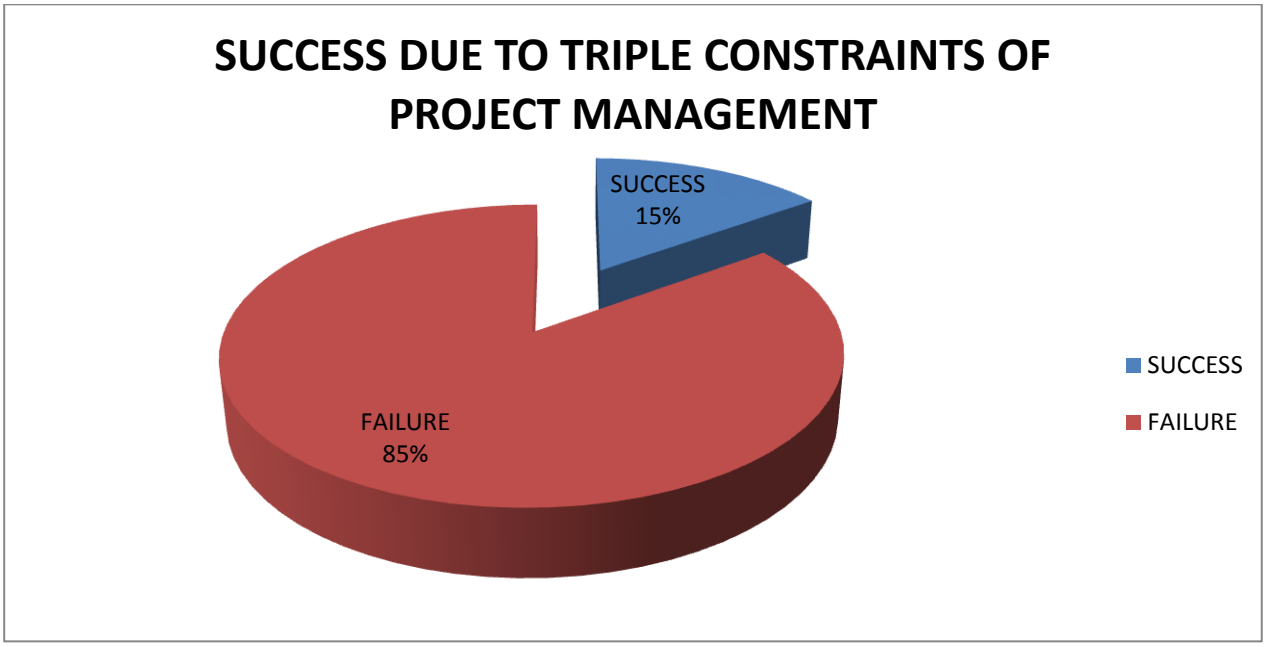


Figure 4.1: Success due to triple constraints

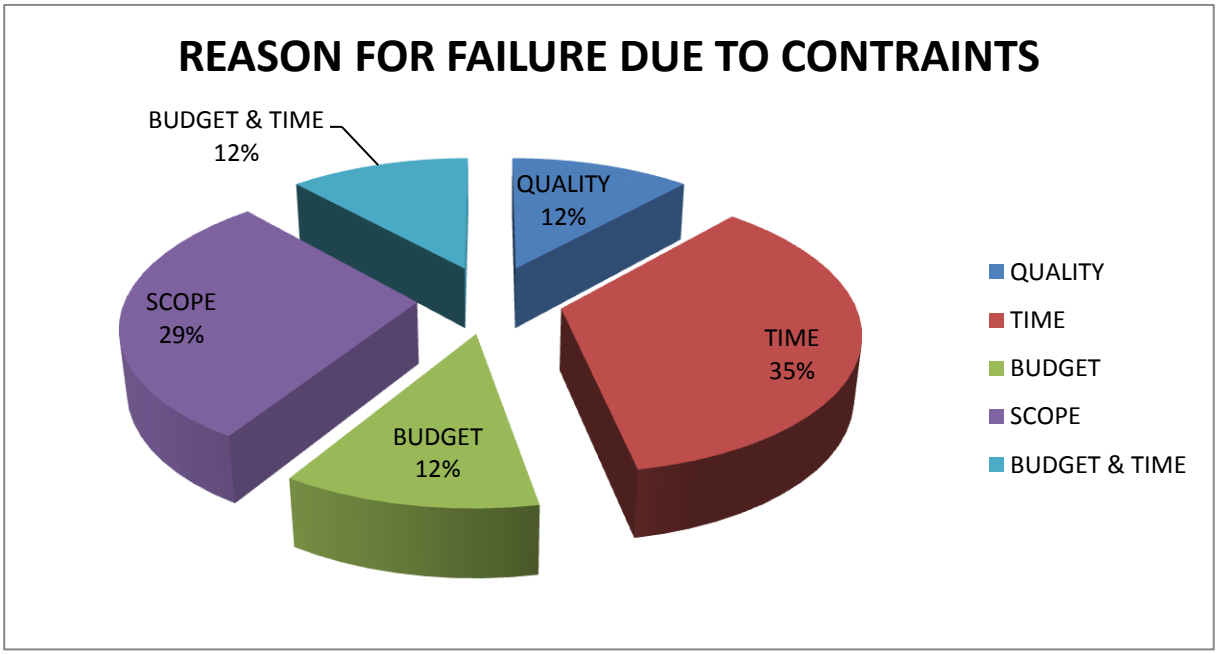


Figure 4.2: Reason for failure due to constraints

The actual success and failure is indicated in fig 4.3 as success and failure due to stake holder's expectations. A total of 60% of PPMC's projects were considered successful and 40% failed (see fig 4.3). Reasons for the actual failure is indicated in fig 4.4- bad scoping contributes to 37% failure, budget and quality each contributes to

25%, combined budget and time contributes 13%, while time alone has not been responsible for any failure from the stakeholder's perspective.

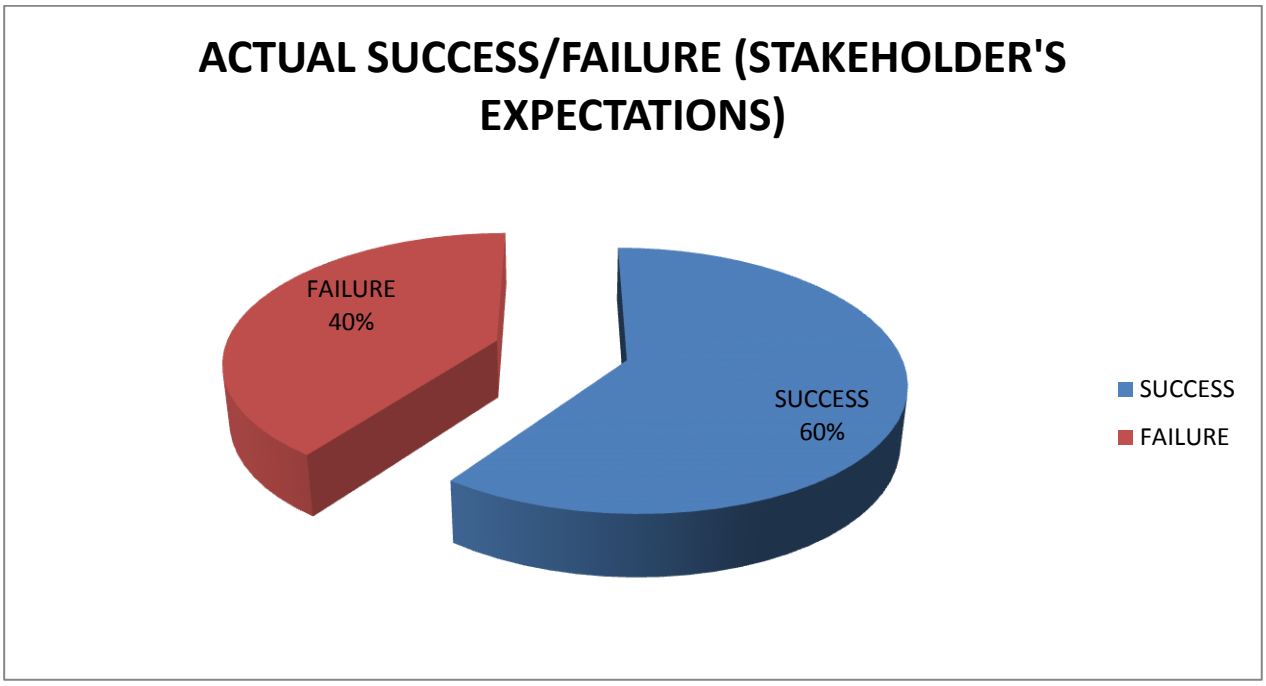


Figure 4.3: Success/Failure Chart due to stakeholders' expectation

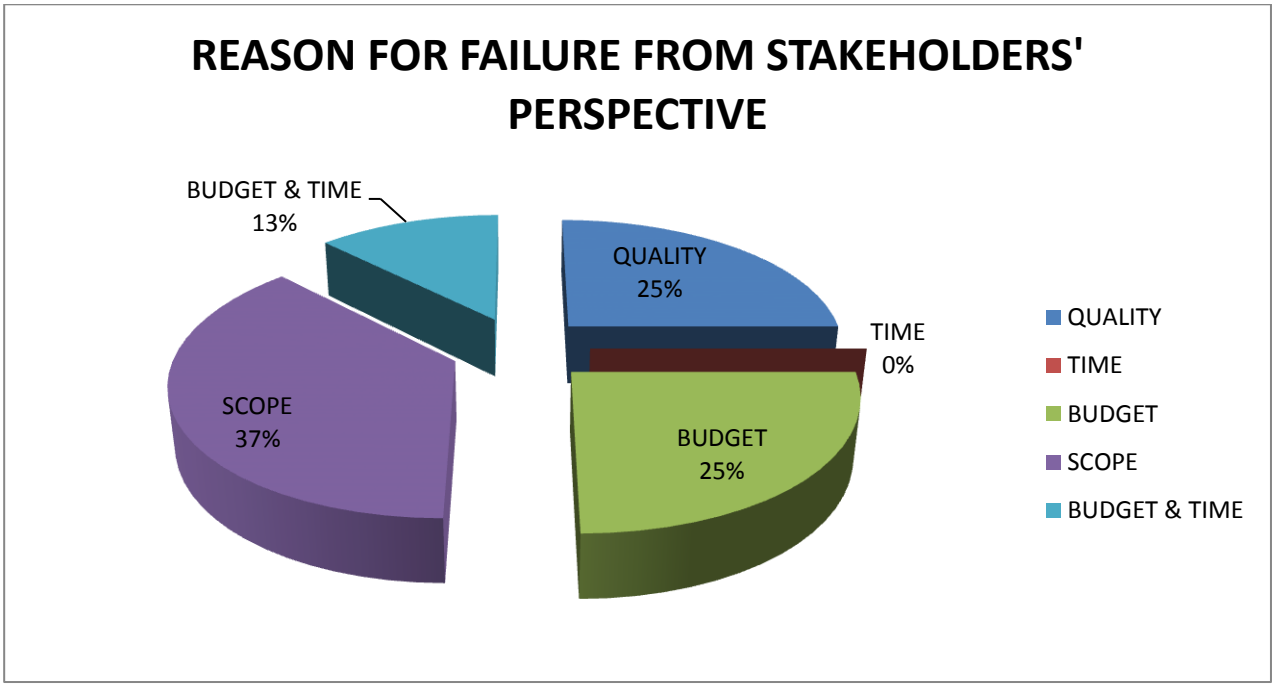


Figure 4.4: Reason for failure from stakeholders' perspective

4.3 ANALYSIS OF QUESTIONNAIRE

4.3.1 RESPONDENTS INFORMATION

Fifty (50) questionnaires were distributed to staff and contractor of PPMC, 44 were returned completed as shown in Appendix 2 in the appendices. The analysis is presented below:

Figure 4.5 shows that 15% of the respondents are Top Management, 32% are Middle Management Staff, 14% are Supervisors and 41% Senior Staff in their various organisations including PPMC.

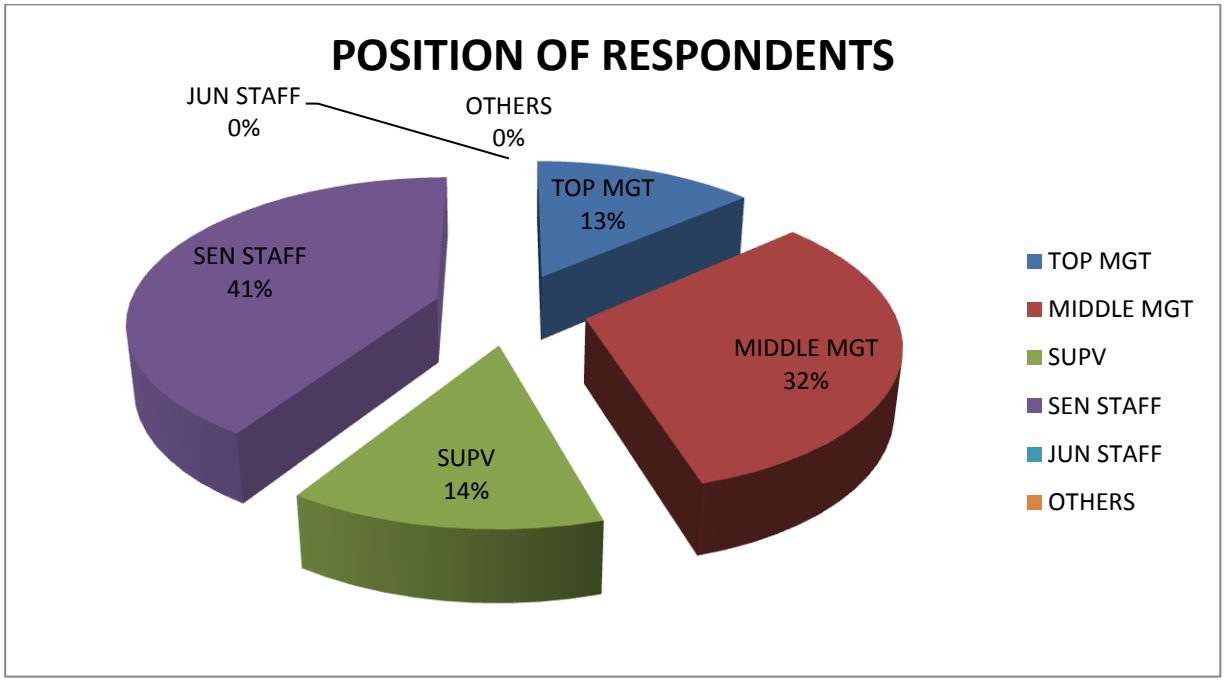


Figure 4.5: Position of respondents

Professionally, 73% among the respondents are Engineers, 9% Technologists, 5% Project Management Experts, 4% Accountants and the remaining 9% from other fields (fig 4.6).

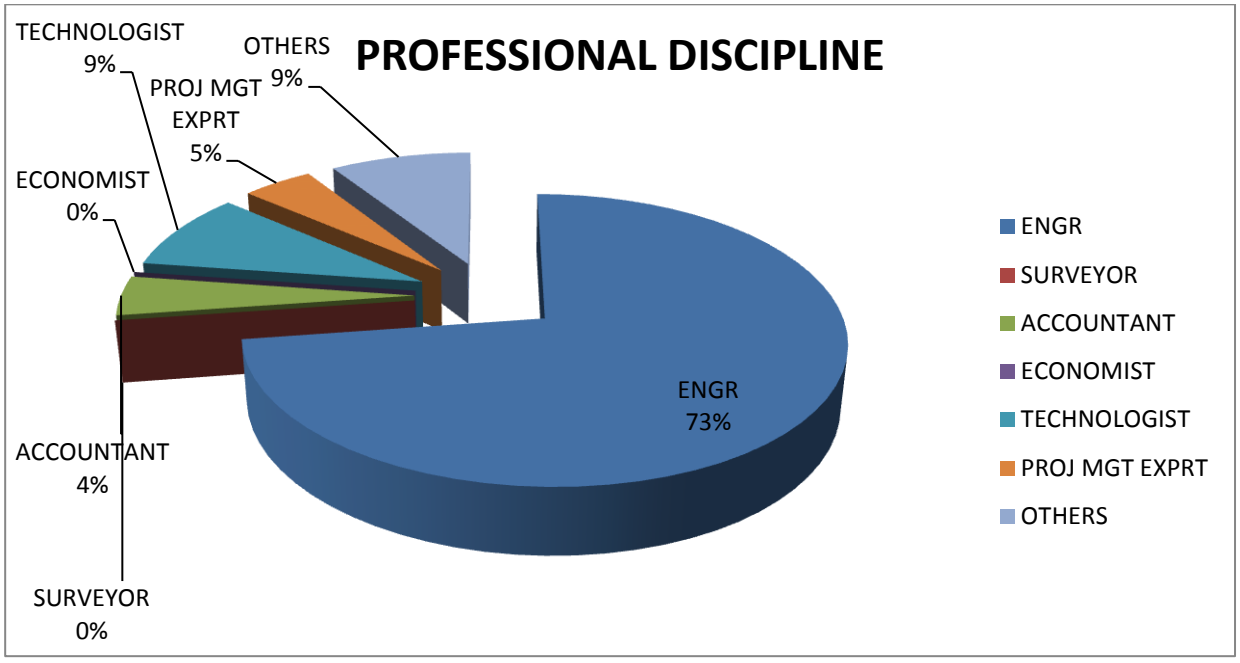


Figure 4.6: Professional discipline of respondents

In terms of experience on the job, 32% have 5-10 years experience, 22% with 10-15 years, 23% with 15-25 years and 23% with more than 25years experience (fig 4.7).

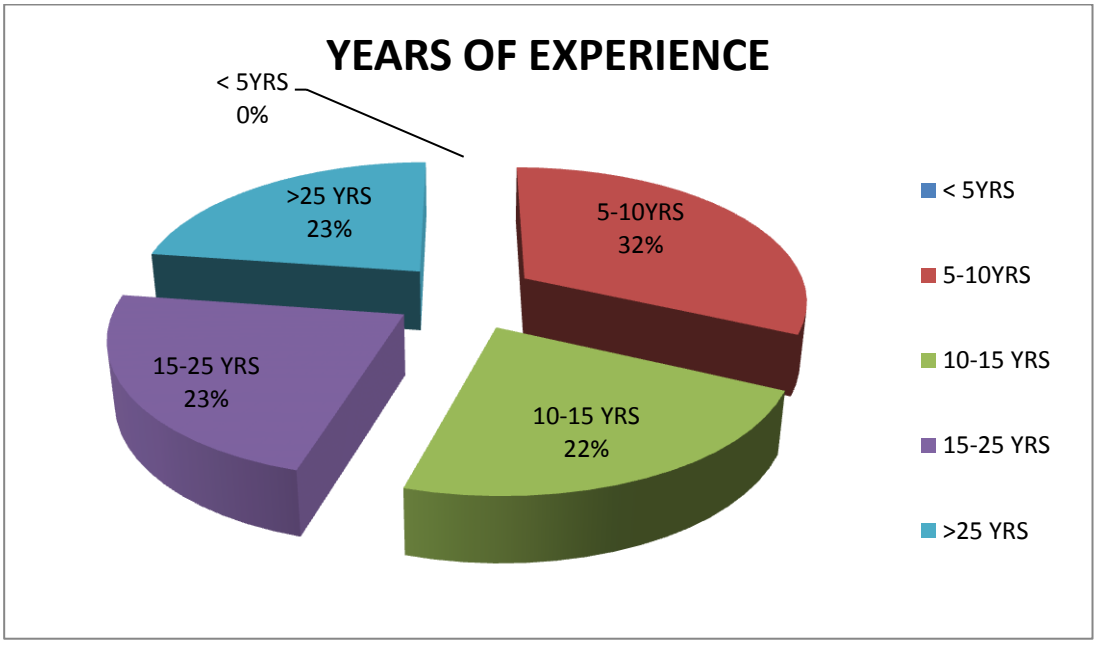


Figure 4.7: Years of experience of the respondents

The respondents have participated in different capacities for various projects during their careers with 27% participating in more than 25 projects, 14% participated in 15-

25 projects, 235 in 10-15 projects, 32% in 5-10 projects and the remaining 4% participated in less than 5 projects each (See fig 4.8).

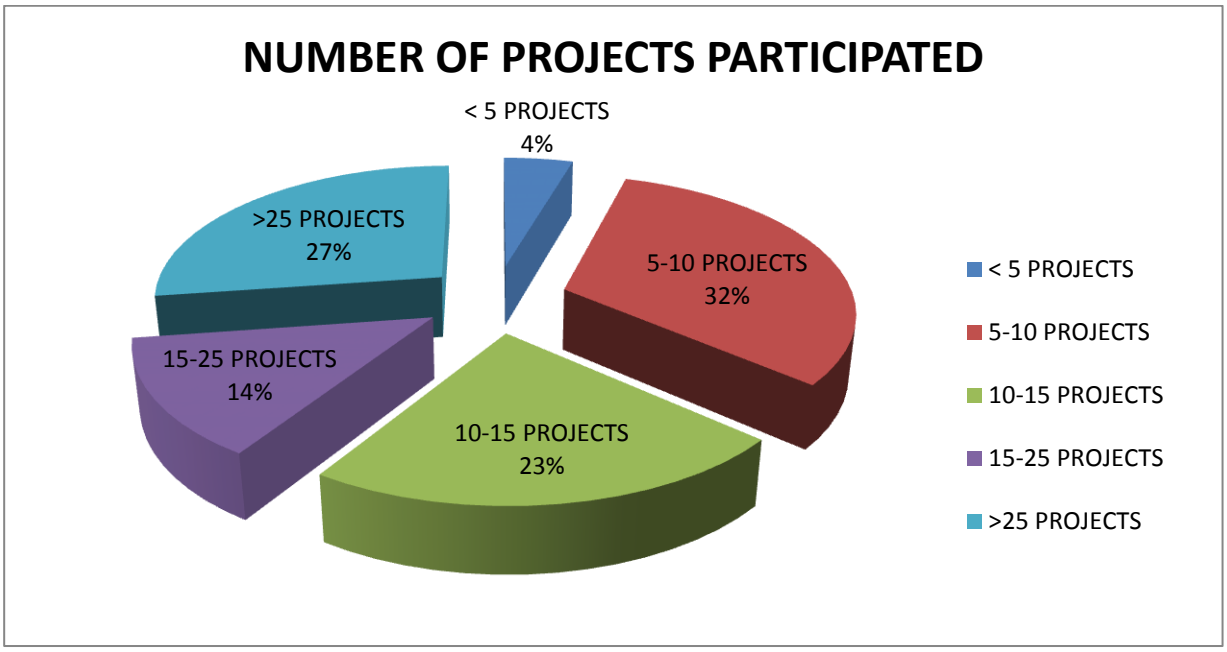


Figure 4.8: Number of projects participated by respondents

21% of the respondents have participated in a capacity of Project Manager, 55% as projects team Members, 7% as consultants, 14% as projects owners and 3% in other capacities as indicated in fig 4.9. Note that some of the respondents participated in different capacities for different projects as can be seen from Appendix 2 in the appendices section. Figure 4.10 indicates in number the summary of information of the respondents.

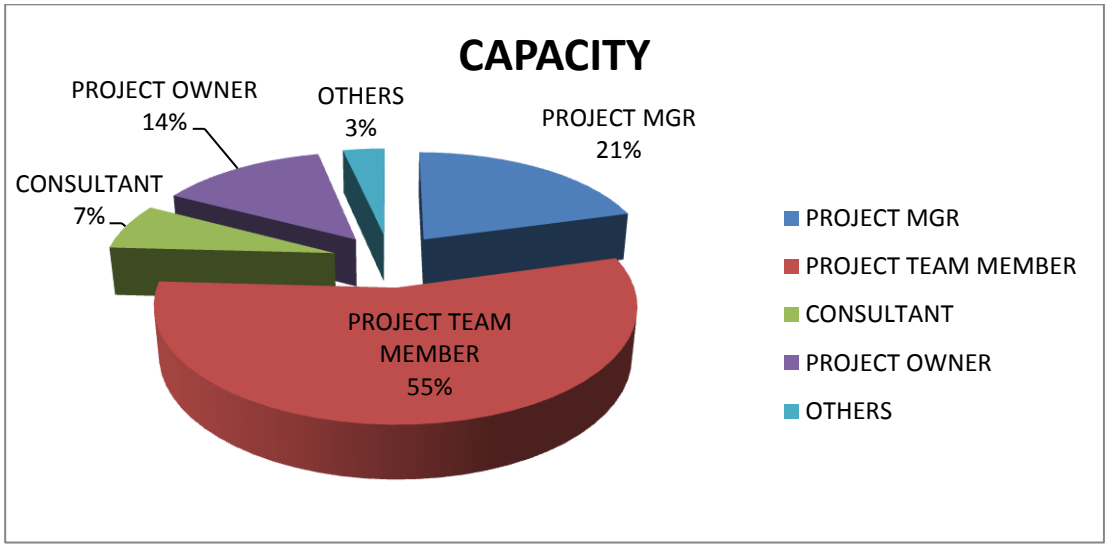


Figure 4.9: Capacities participated by the respondents

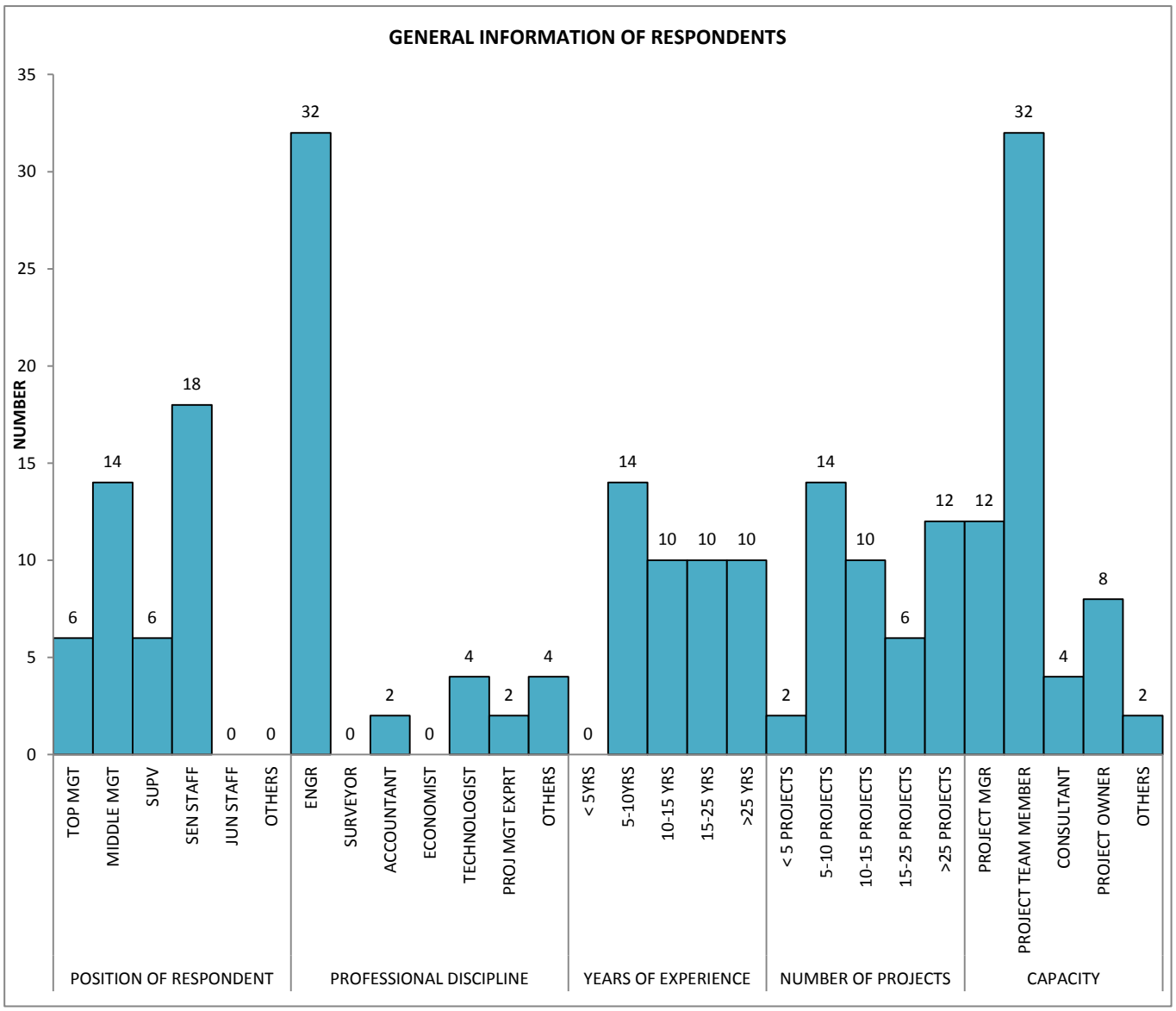


Figure 4.10: Summary of general information of respondents

4.3.2 RESULTS

Eighteen questions related to project Management, Projects failure, reason for failure and Ways of ensuring success were administered in the questionnaire. The various responses was analysed in figures 4.11-4.28 below. A sample of the questionnaire is attached as appendix 3 in the appendices section of the report.

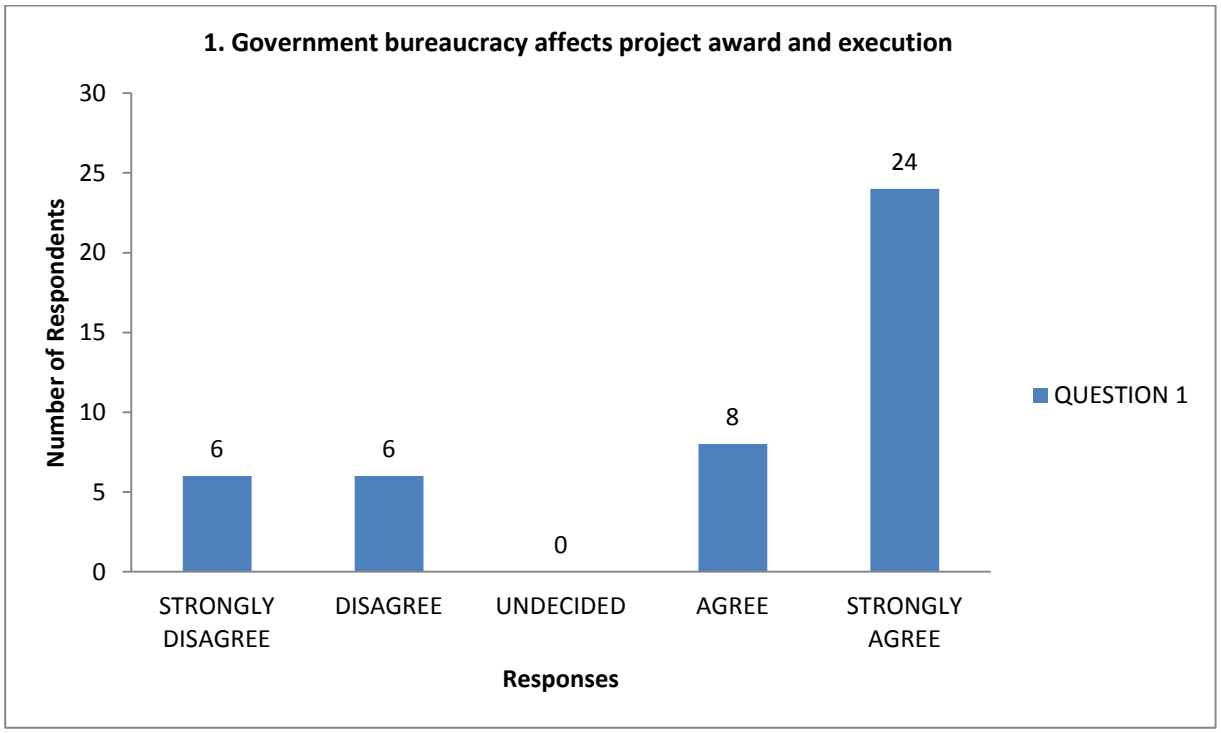


Figure 4.11: Bar Chart showing responses of questions 1

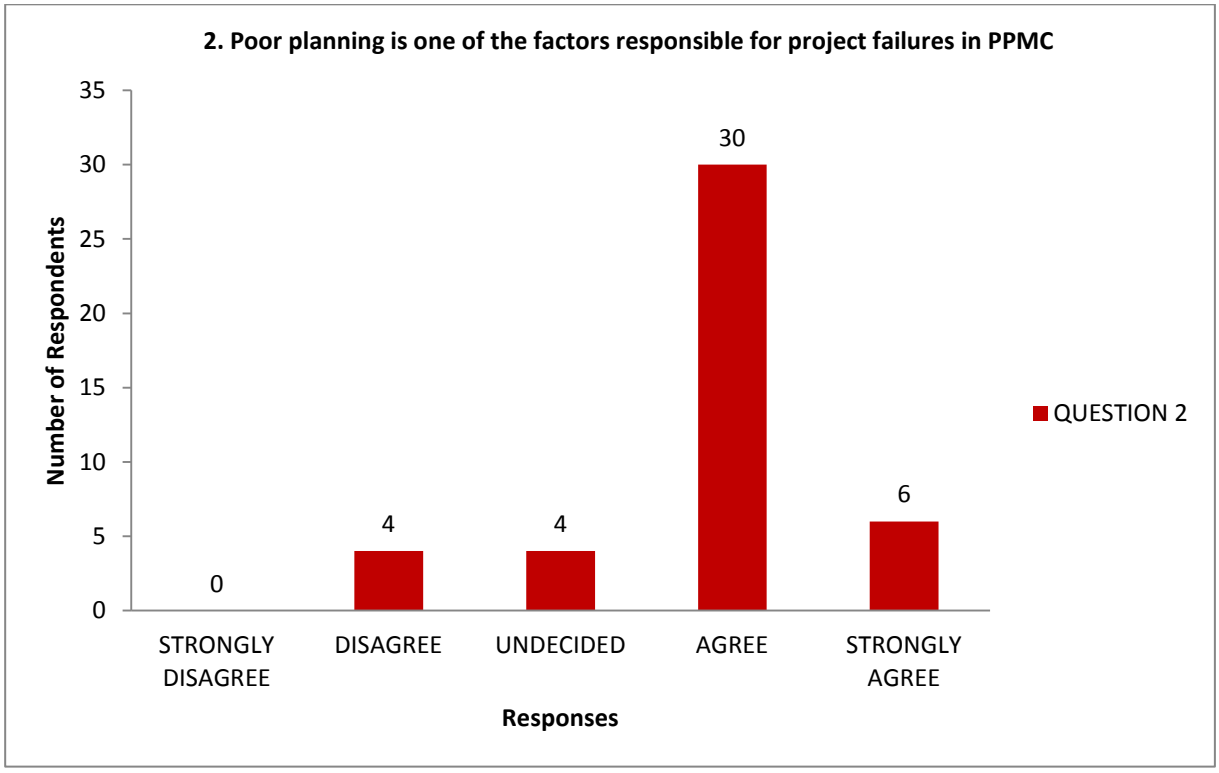


Figure 4.12: Bar Chart showing responses of questions 2

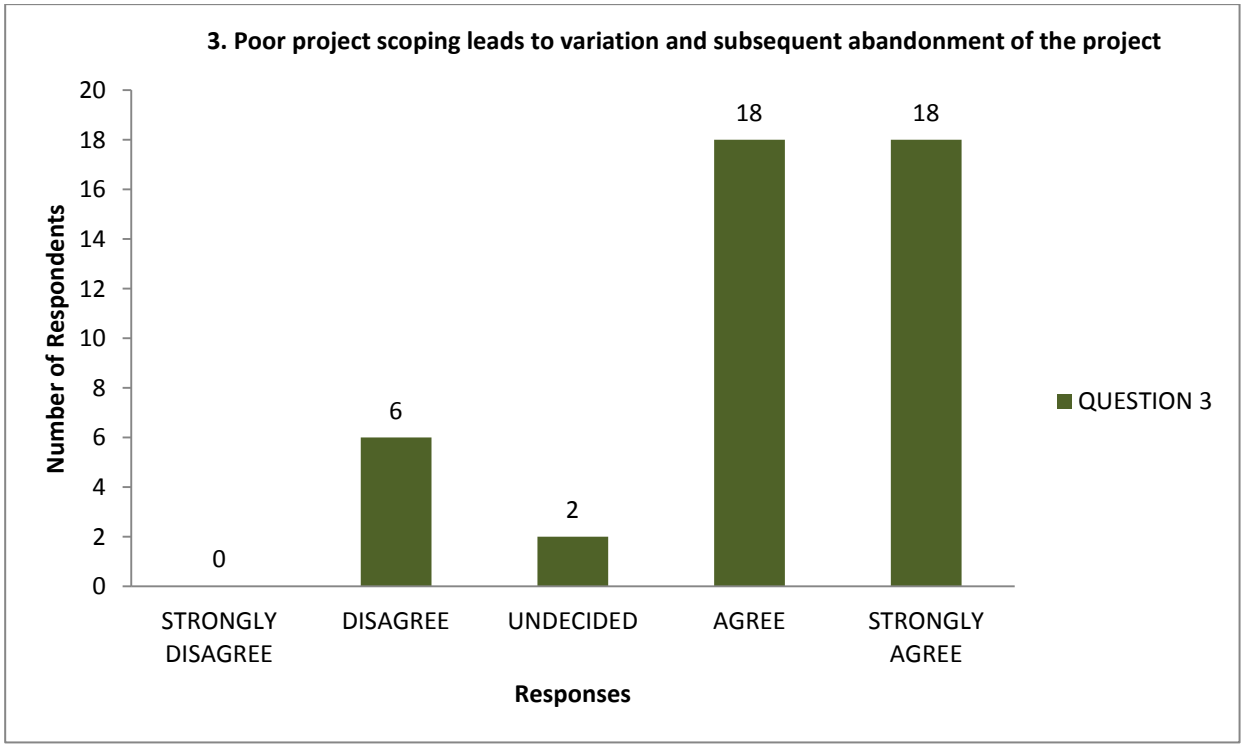


Figure 4.13: Bar Chart showing responses of questions 3

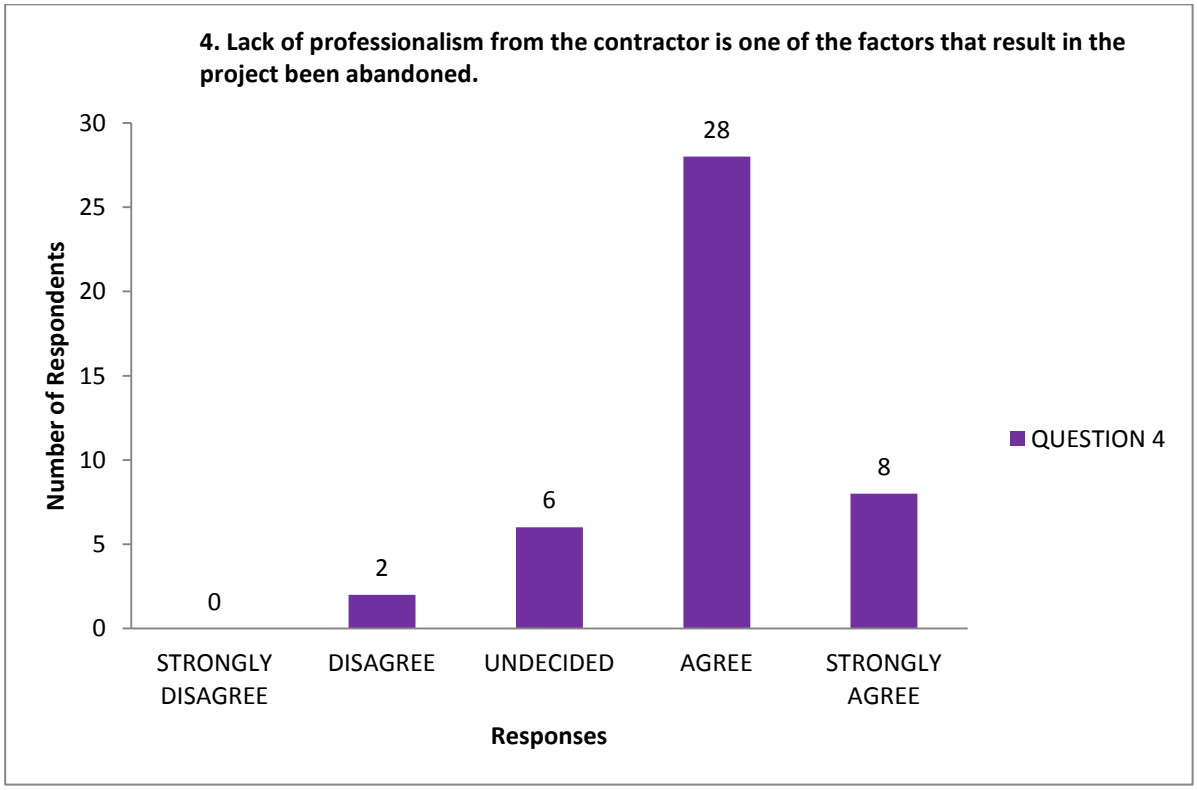


Figure 4.14: Bar Chart showing responses of questions 4

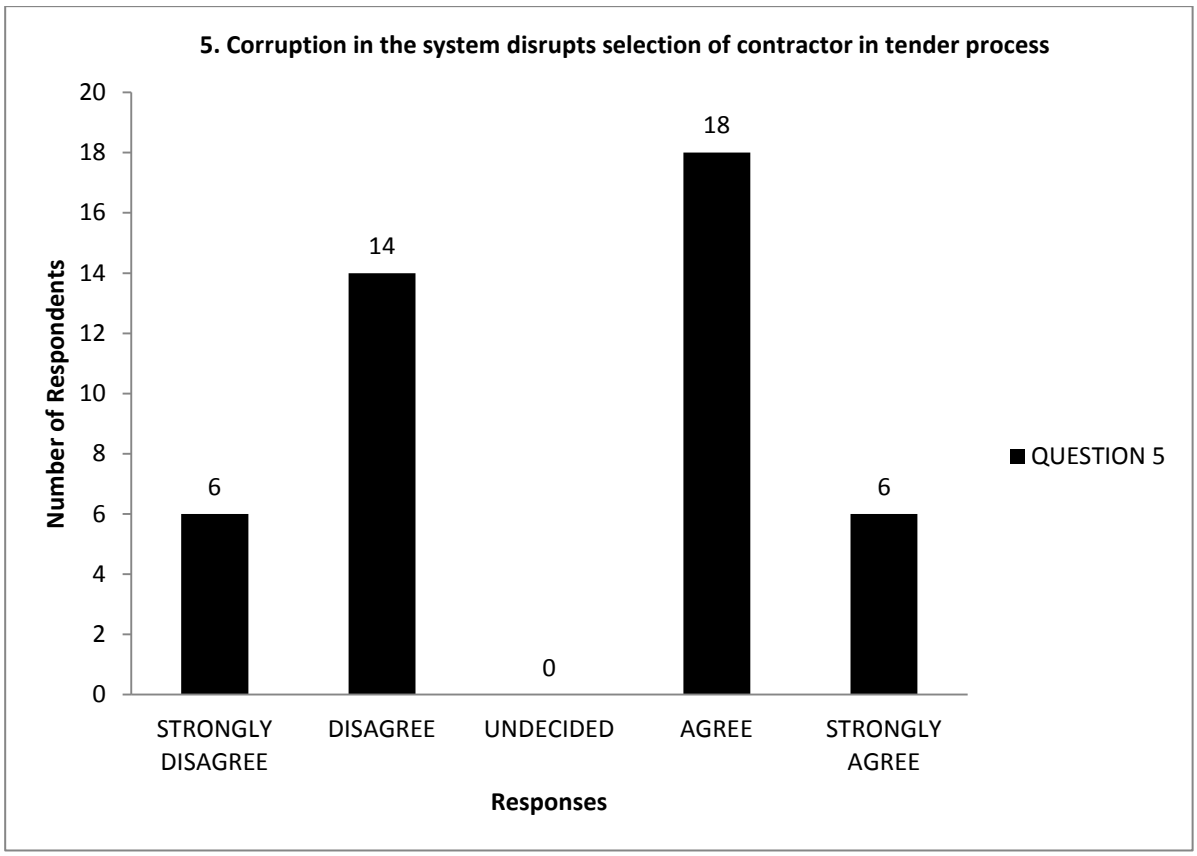


Figure 4.15: Bar Chart showing responses of questions 5

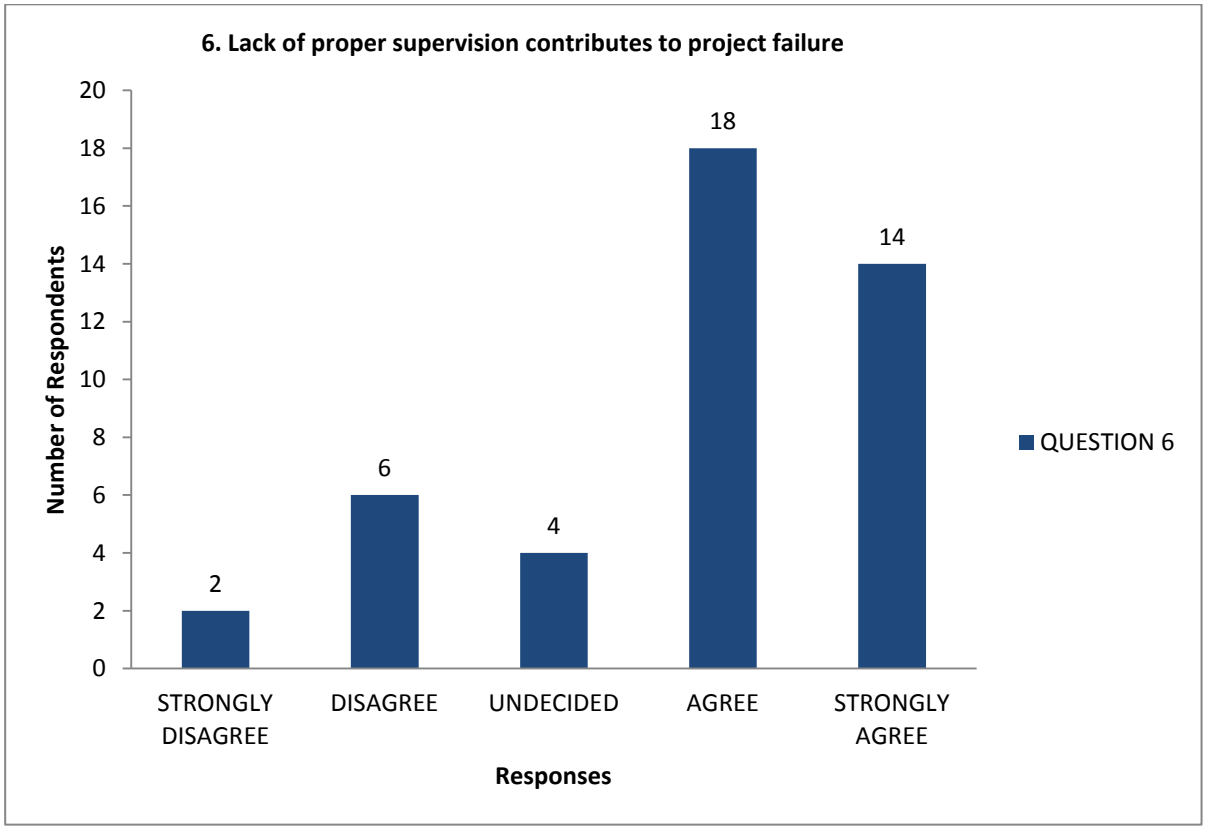


Figure 4.16: Bar Chart showing responses of questions 6

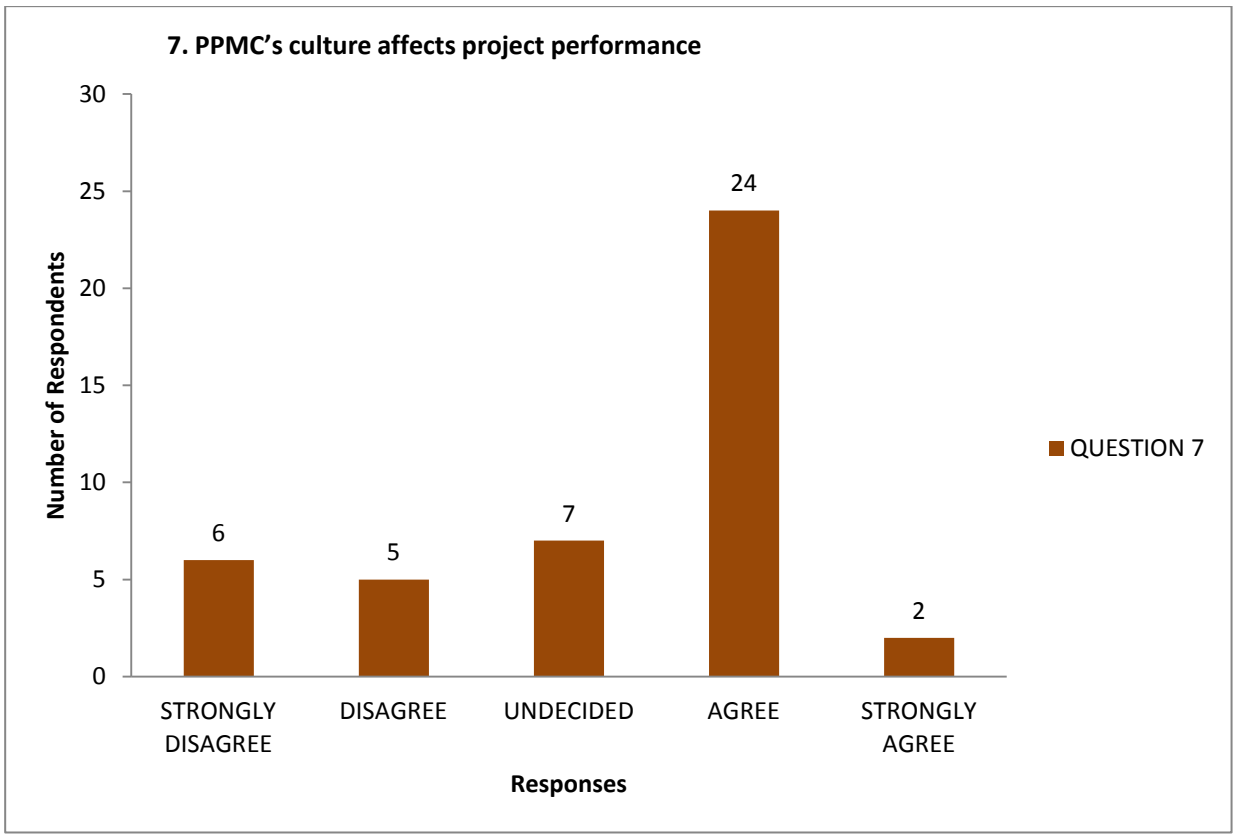


Figure 4.17: Bar Chart showing responses of questions 7

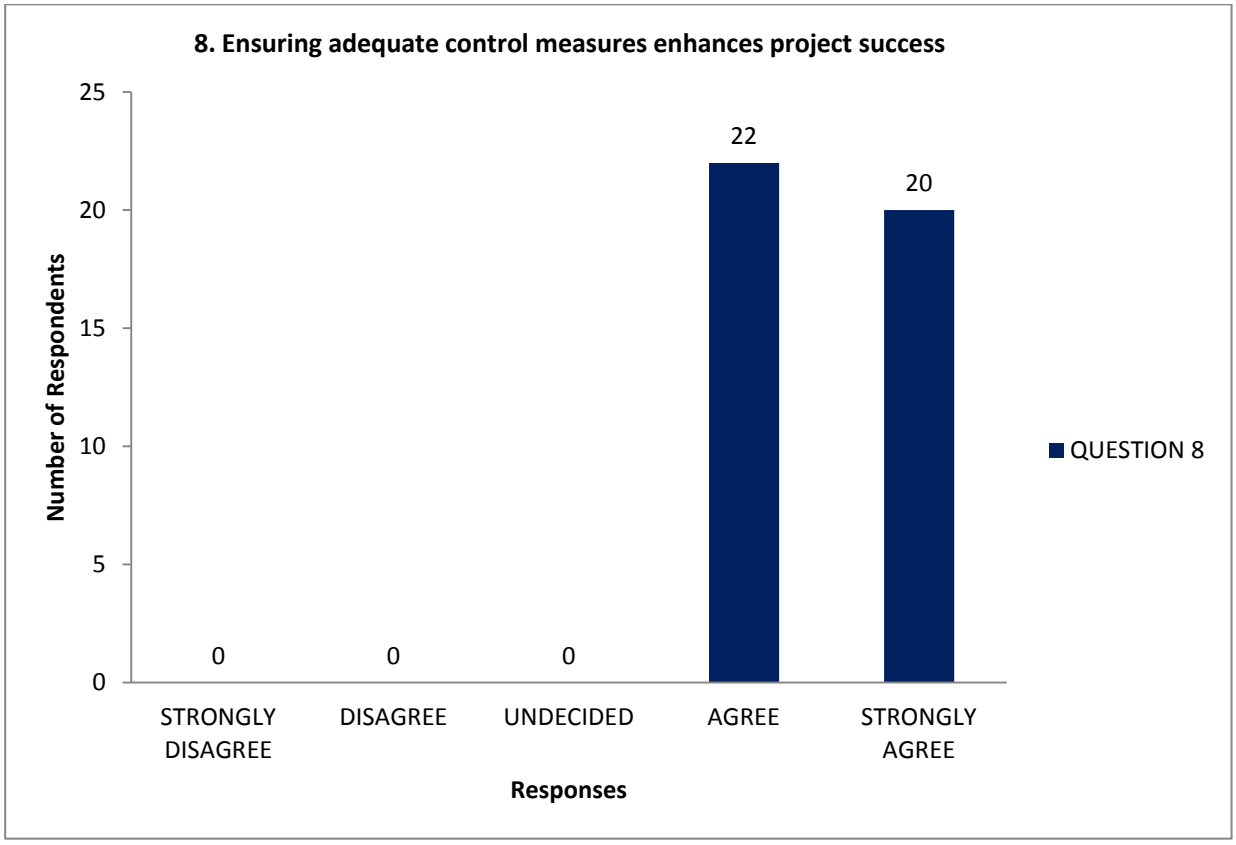


Figure 4.18: Bar Chart showing responses of questions 8

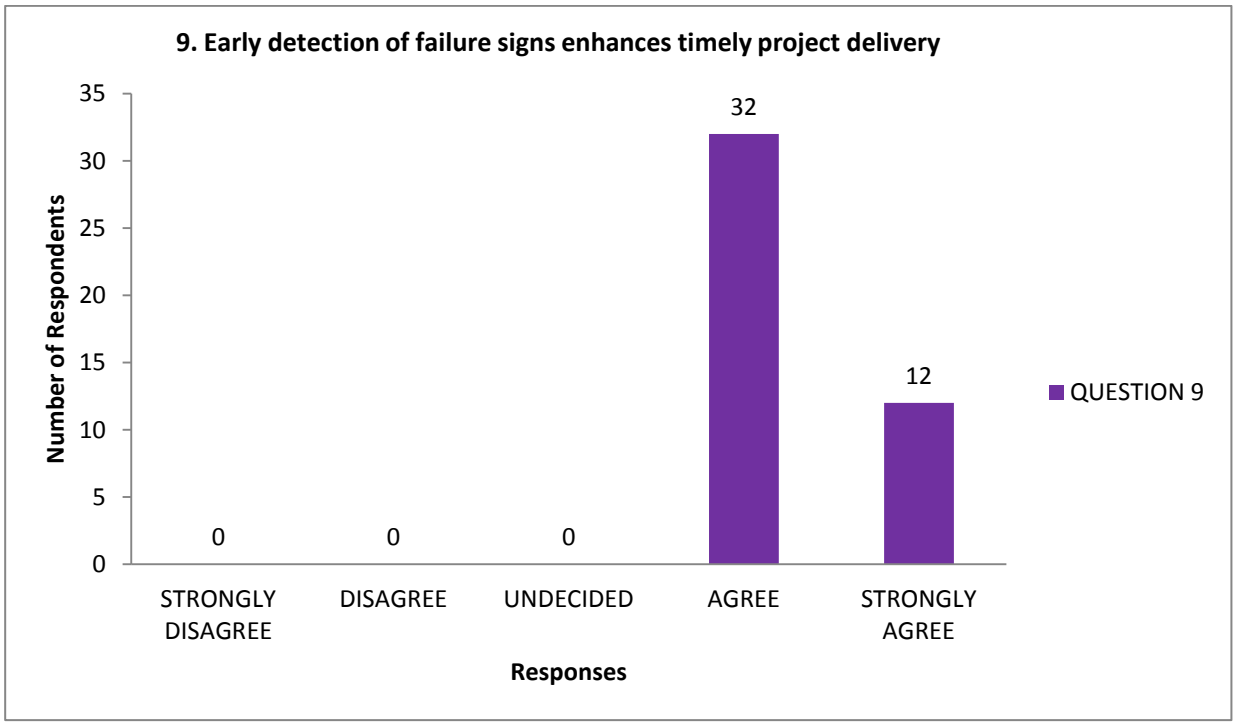


Figure 4.19: Bar Chart showing responses of questions 9

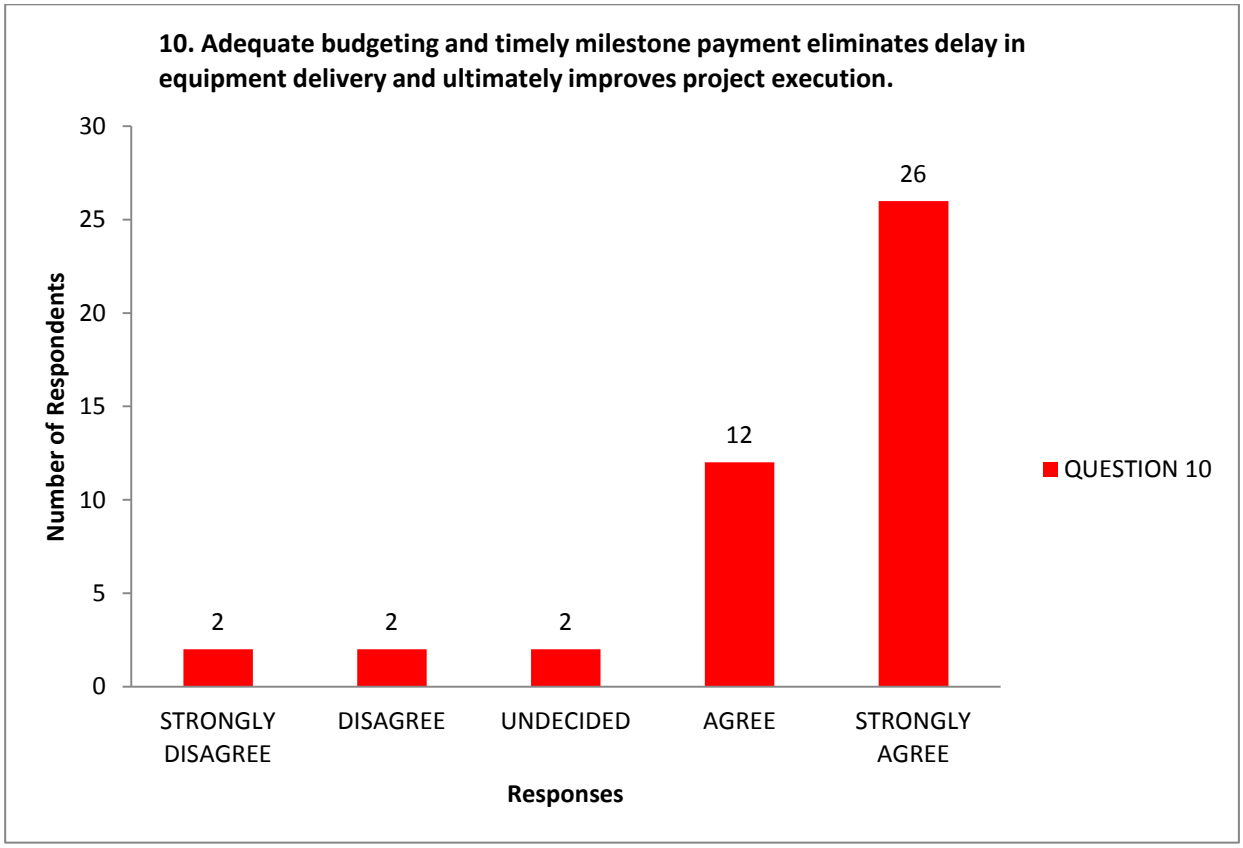


Figure 4.20: Bar Chart showing responses of questions 10

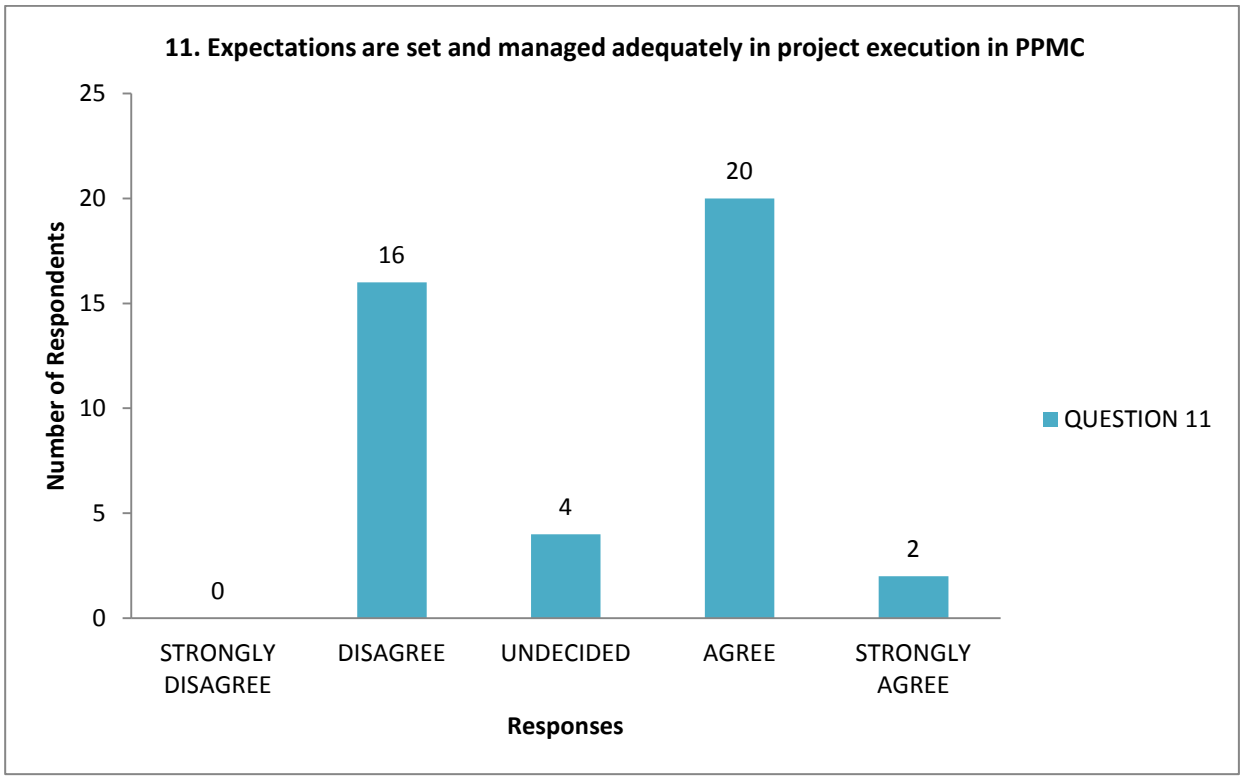


Figure 4.21: Bar Chart showing responses of questions 11

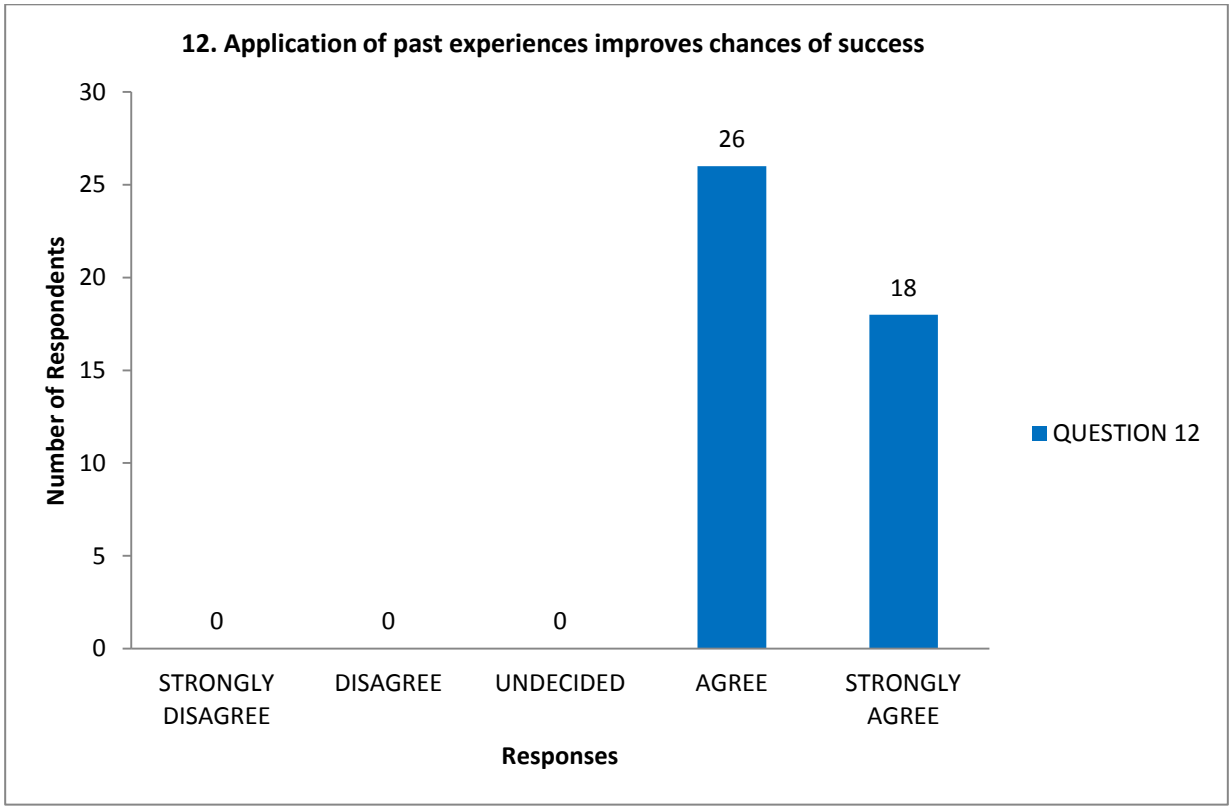


Figure 4.22: Bar Chart showing responses of questions 12

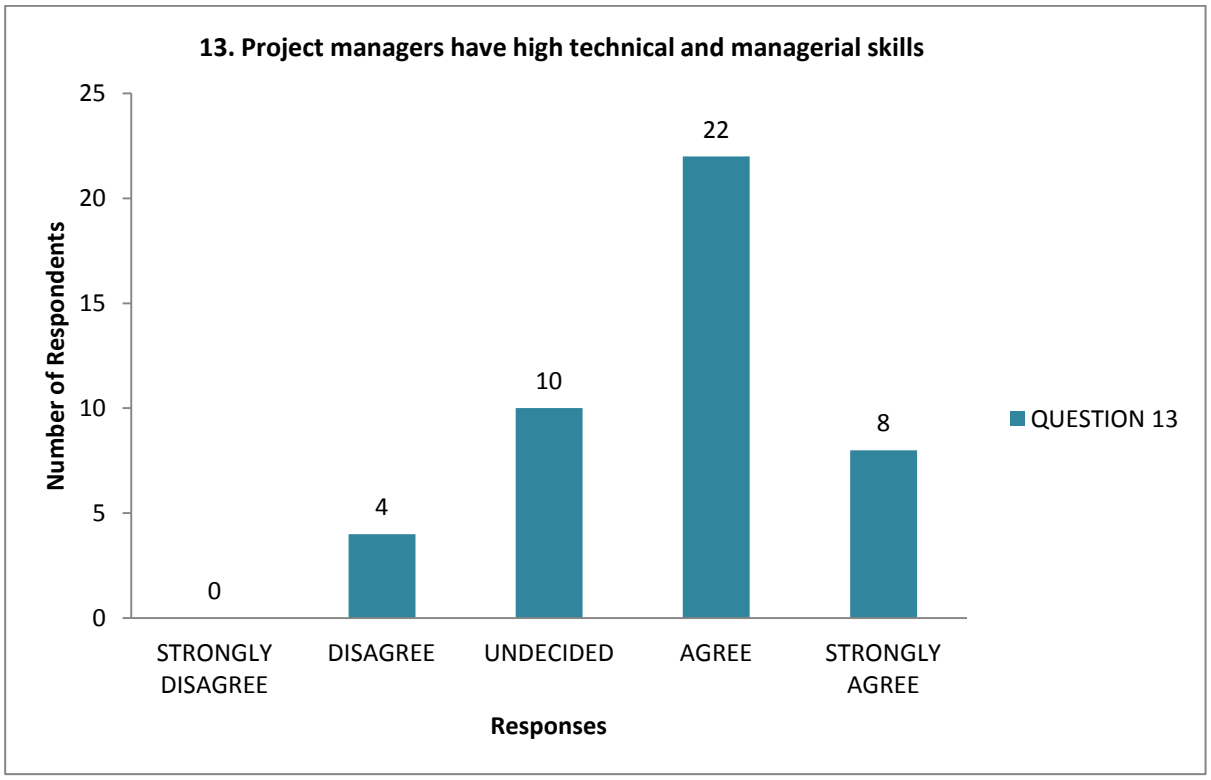


Figure 4.23: Bar Chart showing responses of questions 13

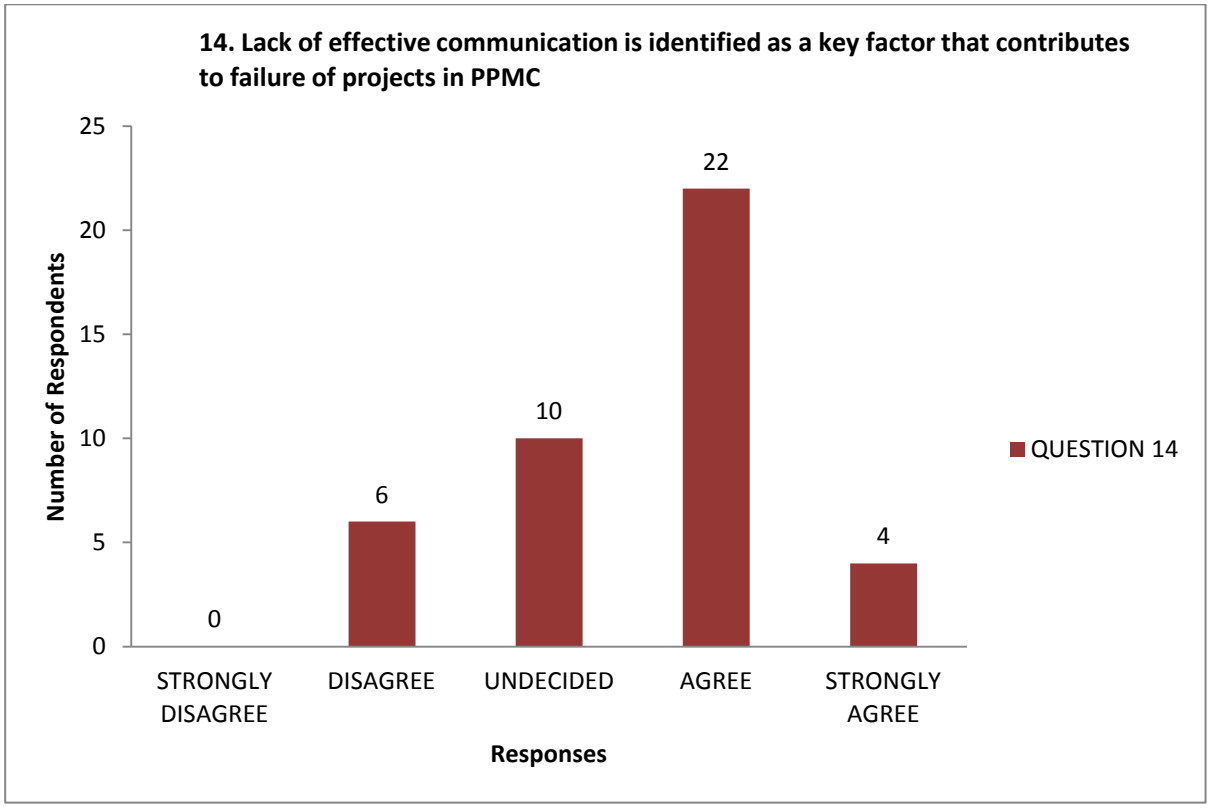


Figure 4.24: Bar Chart showing responses of questions 14

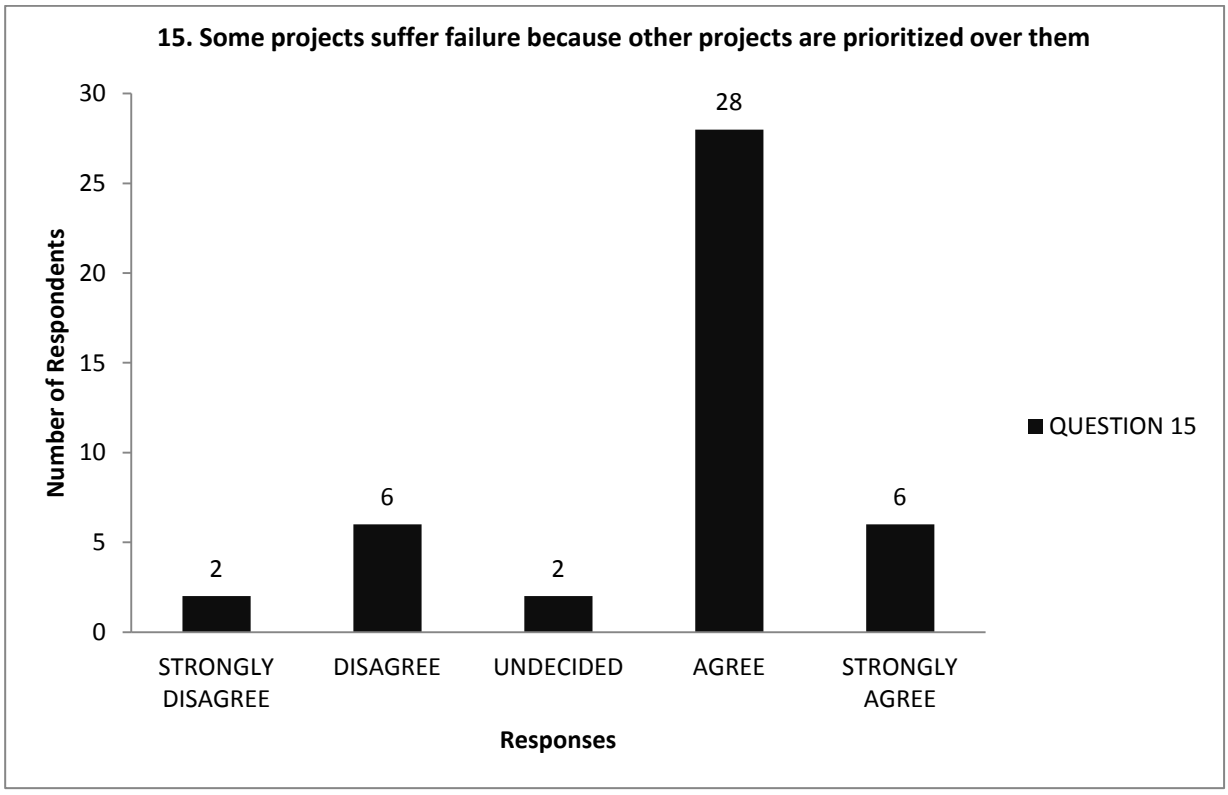


Figure 4.25: Bar Chart showing responses of questions 15

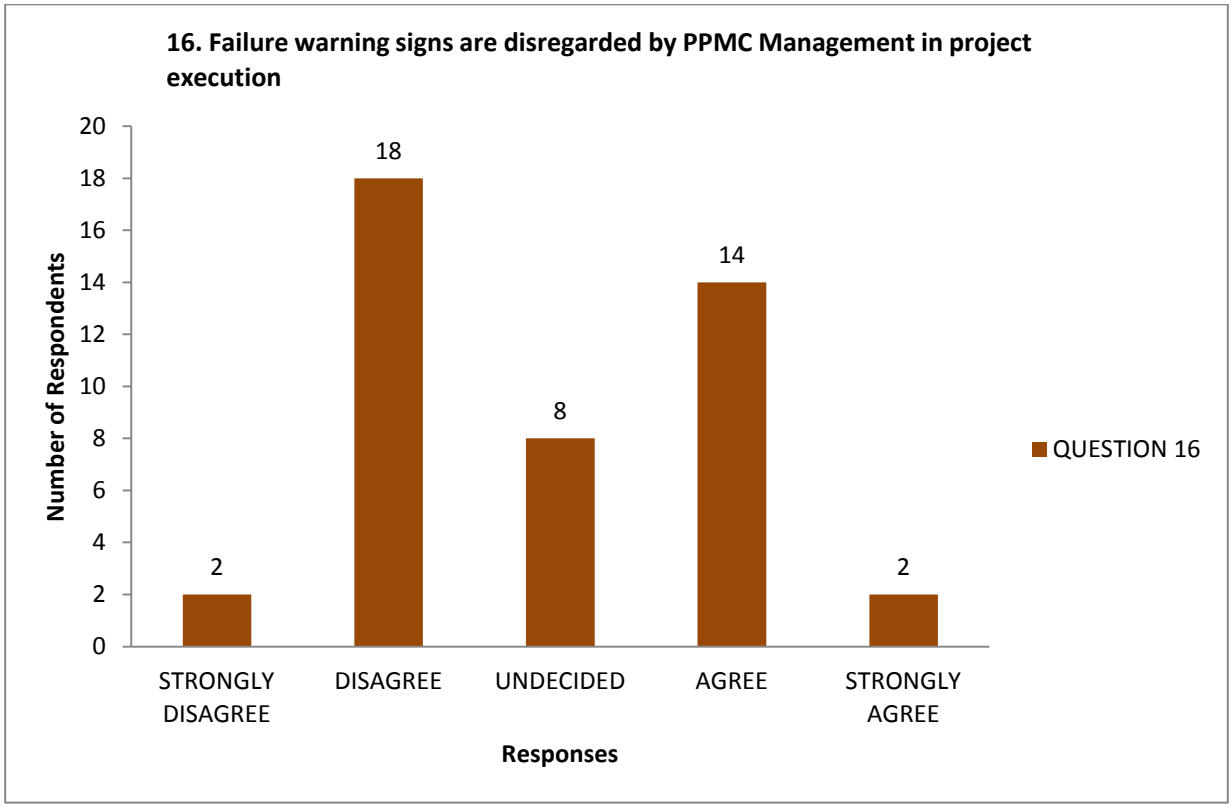


Figure 4.26: Bar Chart showing responses of questions 16

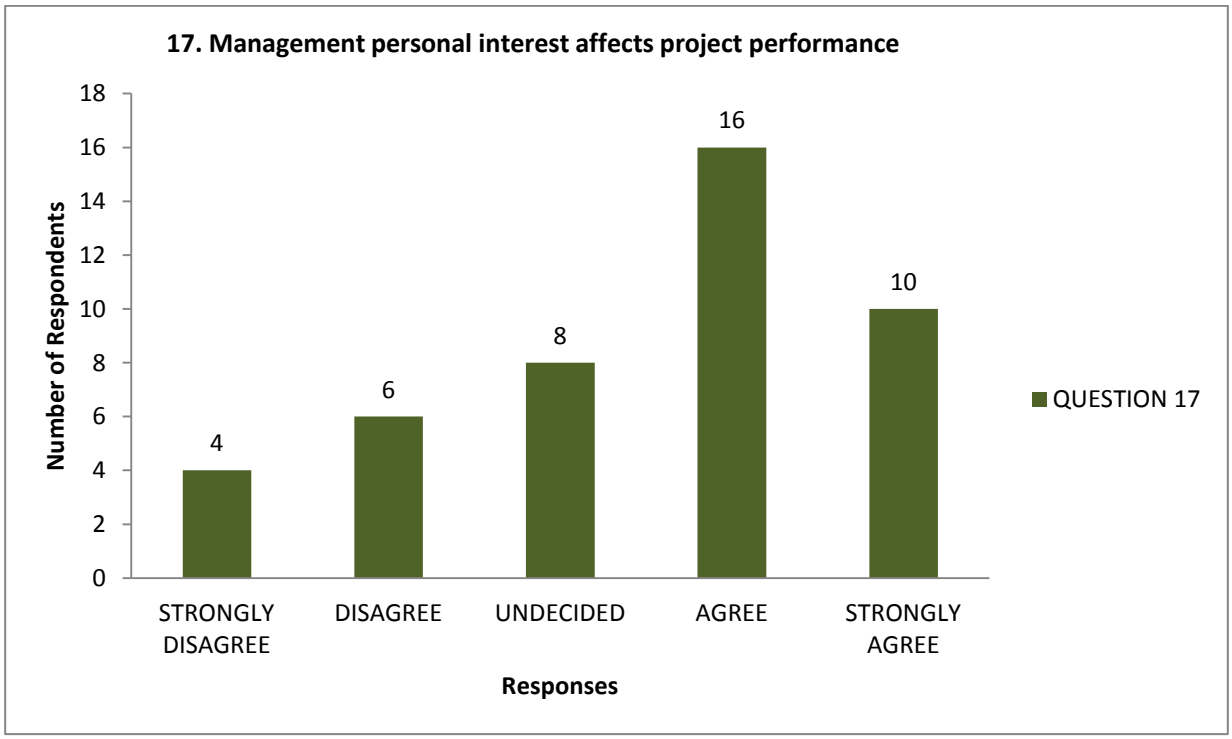


Figure 4.27: Bar Chart showing responses of questions 17

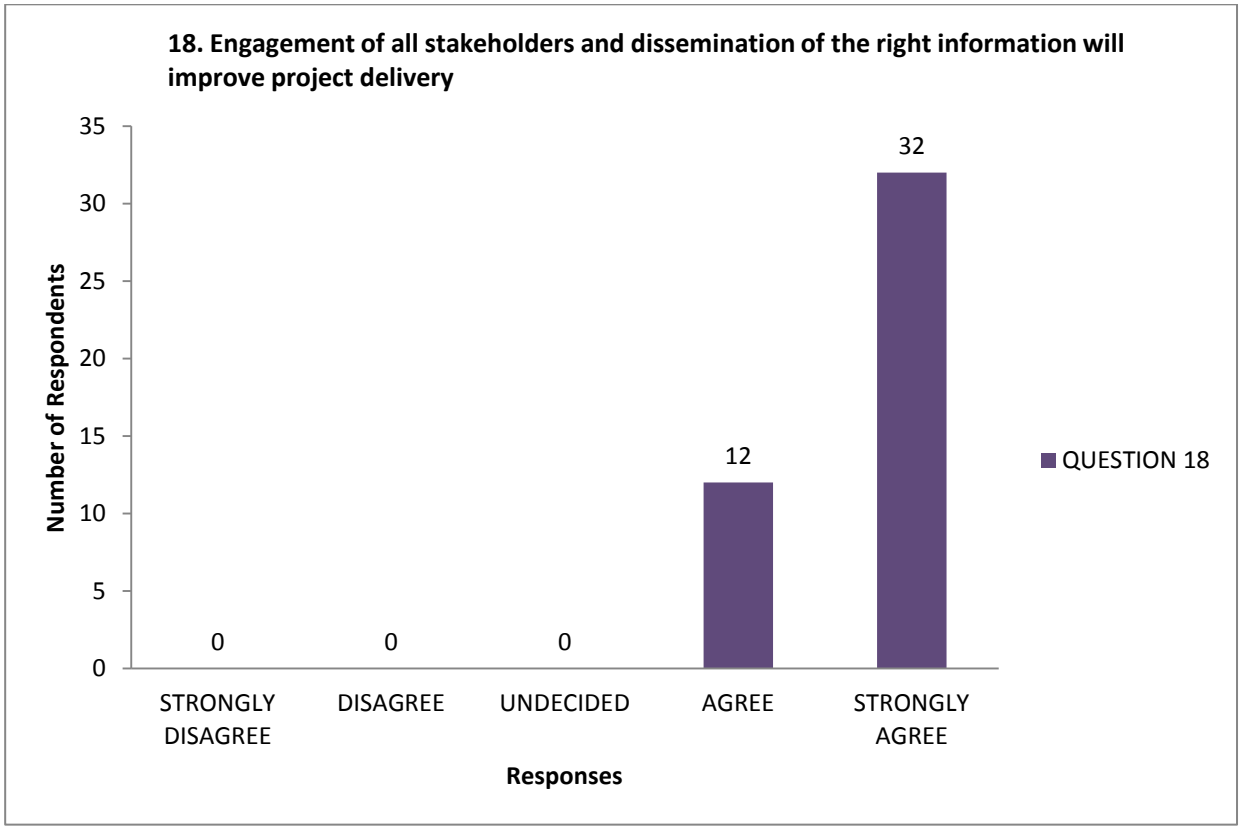


Figure 4.28: Bar Chart showing responses of questions 18

24 of the respondents, which represents majority strongly agree with the statement of question 1 that "Government bureaucracy affects project award and execution" (Figure 4.11). Majority of the respondents agree that "Poor planning is one of the factors responsible for project failures in PPMC" (Figure 4.12). It was a split between people that strongly agree and those that agree with the third statement which says "Poor project scoping leads to variation and subsequent abandonment of the project" (Figure 4.13). Majority also agree that "Lack of professionalism from the contractor is one of the factors that result in the project been abandoned" (Figure 4.14). It was a close call for the statement that "Corruption in the system disrupts selection of contractor in tender process" (Figure 4.15), while 18 of the respondents agree with

the statement 14 did not agree with a split vote of 6 each for strongly agree and strongly disagree.

18 of the respondents agree and 14 strongly agree that “Lack of proper supervision contributes to project failure” (Figure 4.16). 24 of the respondents agree with the statement “PPMC’s culture affects project performance” (Figure 4.17). It was a unanimous decision on “Ensuring adequate control measures enhances project success” and “Early detection of failure signs enhances timely project delivery” with all respondents either agree or strongly agreeing with the two statements (Figure 4.18 and 4.19).

Majority of the respondent strongly agree with the statement “Adequate budgeting and timely milestone payment eliminates delay in equipment delivery and ultimately improves project execution” (Figure 4.20). It was a close call on the statement “Expectations are set and managed adequately in project execution in PPMC” (Figure 4.21), where 20 of the respondents agree while 16 disagree with 4 undecided. It was a unanimous decision on the statement “Application of past experiences improves chances of success” (Figure 4.22) with all respondents either agreeing or strongly agreeing with the statement. Majority of the respondents agree with the three statements “Project managers have high technical and managerial skills”, “Lack of effective communication is identified as a key factor that contributes to failure of projects in PPMC” and “Some projects suffer failure because other projects are prioritized over them” (Figure 4.23-4.25).

However, majority of the respondents disagree with the statement that “Failure warning signs are disregarded by PPMC Management in project execution” although eight people are undecided over it (Figure 4.26). Majority of the respondents either agree or strongly agree with the statement that “Management personal interest affects project performance” (Figure 4.27). While all the respondents unanimously agree or strongly agree that “Engagement of all stakeholders and dissemination of the right information will improve project delivery” (Figure 4.28).

CHAPTER FIVE

5.0 CONCLUSION AND RECOMMENDATIONS

5.1 CONCLUSION

Considering the analysis of the selected projects presented in this report and the analysis of questionnaires administered to some professionals, some conclusion can be drawn on reasons for failure of projects in PPMC.

Looking at the constraints of project management, meeting the schedule time of project and maintaining the required quality have proven to be the major challenges that affects project success. In other words, the two constraints contribute 72% of the reasons for failure of projects in PPMC due to constraints.

However, the stakeholders do not see failure to finish projects on schedule as one of the criteria for determining the success or failure of their projects. They consider scoping, quality and delay in release of funds as the major causes of failure of their projects.

The following conclusions can be drawn from the results and analysis

1. Considering the triple constraints of projects, 85% of the projects in PPMC were discovered to have failed within the period under consideration.
2. Meeting the project schedule, bad scoping, budget and quality were found to be the major causes of project failure in PPMC with each contributing to 41%, 29%, 18% and 12% respectively to the total failure of the projects considering the triple constraints.

3. 40% of the projects were found to have failed from stakeholder's perspective.
4. The stakeholder's identified 37% of the failure from bad scope, 25% each from budget and quality and a combination of budget and time contributes to the remaining 13%.
5. The type of failure identified from the analysis is mostly abandonment of the projects. This is caused by
    i. Delay in release of funds
    ii. Scope Creep
    iii. Inappropriate scope from the initial planning stage
    iv. Lack of professional knowledge from the contractor
    v. Corruption
6. Employment of means for adequate budgeting and timely milestone payment has been identified as the most workable solution to forestall the future problems of failure and abandonment of projects. This will eliminate delay in equipment delivery and ultimately improve project execution.

5.2 RECOMMENDATIONS

The following measures if employed will improve projects delivery and success:

1. Ensure adequate control measures are employed, this will enhance project success.
2. Ensure early detection of failure signs to enhance timely project delivery.
3. Ensure proper application of past experiences to improve chances of success.

4. Management should ensure engagement of all stakeholders and dissemination of the right information to improve project delivery.

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APPENDICES

APPENDIX 1: SELECTED PROJECTS FROM PPMC

S/N	PROJECT DESCRIPTION	PROJECT AMOUNT	DATE OF AWARD	COMPLETION PERIOD	STATUS	DATE OF COMPLETION	REMARKS	SUCCESS DUE TO TRIPLE CONSTRAINTS OF PROJECT MANAGEMENT	REASON FOR FAILURE	ACTUAL SUCCESS/FAILURE (STAKEHOLDER'S EXPECTATIONS	REASON FOR FAILURE (STAKE HOLDER'S EXPECTATION)
1	PROVISION OF PHCN SUPPLY ABUDU PUMP STATION	14,200,000.00	02 September 2014	8 MONTHS	ONGOING		SUBSTANDARD MATERIALS USED BY CONTRACTOR	FAILURE	QUALITY	FAILURE	QUALITY
2	RECONSTRUCTION OF BENIN DEPOT NEAR COLLAPSED FENCE	51,392,407.50	16 July 2014	6 MONTHS	COMPLETED	04 December 2015		FAILURE	TIME	SUCCESS	
3	PROVISION OF 500KVA GENERATOR AT WARRI PUMP STATION.	22,800,000.00	23 April 2014	6 MONTHS	COMPLETED	01 August 2014		SUCCESS		SUCCESS	
4	REPLACEMENT OF 11KV AND 415V SWITCHGEARS AT ESCRAVOS TERMINAL	123,986,265.80	21 October 2014	8 MONTHS	ONGOING		DELAY IN ADVANCE PAYMENT	FAILURE	BUDGET	FAILURE	BUDGET
5	SUPPLY AND INSTALLATION OF COMPLETE STAND ALONE 2EX MAINLINE PUMP PANEL AT PH P/S.	68,743,487.70	21 October 2014	8 MONTHS	ONGOING		DELAY IN ADVANCE PAYMENT	FAILURE	BUDGET	FAILURE	BUDGET
6	REPLACEMENT OF CURRENT TRANSFORMER (CTS) OF THE 2EX DISTRIBUTION PANEL	1,303,314.00	29 July 2010	4 WEEKS	ABANDONED		WRONG SPECIFICATION OF MATERIALS	FAILURE	SCOPE	FAILURE	SCOPE
7	EXPANSION OF PPMC LOADING GANTRY AND FACILITIES AT CALABAR DEPOT.	243,340,763.40	11 December 2010	10 MONTHS	COMPLETED	24 April 2013	DELAY IN ADVANCE PAYMENT AND CLEARING OF MATERIALS	FAILURE	BUDGET & TIME	SUCCESS	
8	REHABILITATION OF 33KV SWITCHGEAR PANEL MAKURDI DEPOT	16,375,000.00	02 June 2013	6 MONTHS	ONGOING		SCOPE CREEP	FAILURE	SCOPE CREEP	FAILURE	SCOPE
9	RECONSTRUCTION OF ATLAS COVE - MOSIMI PIPELINE SECTION AT IJEODODO SWAMP BY HDD.	760,725,325.00	06 February 2013	3 MONTHS	COMPLETED	19 August 2014	DELAY IN DELIVERY OF MATERIALS AND WEATHER CONDITION	FAILURE	TIME	SUCCESS	

10	RECONSTRUCTION OF ATLAS COVE - MOSIMI PIPELINE SECTIONS AT AREPO SWAMP SUIN HDD AS A SECURITY SOLUTION.	1,285,774,370.00	06 February 2013	4 MONTHS	COMPLETED	19 August 2014	INCIDENCE OF BROKEN DRILL PIPE STRING	FAILURE	SCOPE CREEP	SUCCESS	
11	REHABILITATION OF 33KV AND 3.3KV SWITCHGEAR IN MOSIMI AREA OFFICE	161,729,000.00	11 September 2010	ONE YEAR	ONGOING		SCOPE CREEP	FAILURE	SCOPE CREEP	FAILURE	SCOPE
12	SUPPLY AND INSTALLATION OF ONE(1) COMPLETE ALLEN GEARBOX ASSEMBLY FOR ALLEN DIESEL ENGINE DRIVER AT ATLAS COVE DEPOT		15 January 2013	6 MONTHS	COMPLETED	25 April 2015		FAILURE	TIME	SUCCESS	
13	CONVERSION OF LOADING FACILITIES FROM ANALOGUE TO DIGITAL METERS AT IBADAN DEPOT	73,135,390.55	16 April 2013	9 MONTHS	ONGOING		DELAY IN ADVANCE AND MILESTONE PAYMENTS, DELAY IN DELIVERY OF MATERIALS	FAILURE	BUDGET & TIME	FAILURE	BUDGET & TIME
14	RECONSTRUCTION OF FOUNDATIONS AND RE-INSTALLATION OF TWO (2) EXISTING AND TWO (2) NEW BOOSTER PUMPS AT ESCRAVOS TERMINAL	31,657,500.00	02 July 2014	20 WEEKS	COMPLETED	02 June 2015	DELAY IN MOBILIZATION	FAILURE	TIME	SUCCESS	
15	REHABILITATION OF LPG PLANT AND ANCILLIARY FACILITIES AT ILORIN DEPOT.	42,150,000.00	28 August 2013	6 MONTHS	COMPLETED	15 August 2014	SCOPE CREEP	FAILURE	SCOPE CREEP	SUCCESS	
16	PROVISION OF 500KVA GENERATOR SET IN ILORIN DEPOT.	21,833,500.00	02 September 2014	6 MONTHS	COMPLETED	24 February 2015		SUCCESS		SUCCESS	
17	PROVISION OF PHCN POWER SUPPLY TO SARKIN PAWA PUMP STATION.	32,993,700.00	09 September 2014	8 MONTHS	ONGOING		SUNSTANDARD MATERIALS SUPPLIED BY CONTRACTOR	FAILURE	QUALITY	FAILURE	QUALITY
18	Replacement of 415V,800A loading distribution panel IN MAIDUGURI	10,550,000.00	10 September 2012	6 MONTHS	COMPLETED	01 April 2014	DELAY DUE TO INSECURITY	FAILURE	TIME	SUCCESS	
19	Rehabilitation of LEC-DAS lightning Protection System AT ESCRAVOS	109,934,926.25	25 May 2013	3 MONTHS	COMPLETED	12 July 2013		SUCCESS		SUCCESS	
20	Replacement of loading distribution panel AT ABA DEPOT	11,892,000.00	30 August 2012	6 MONTHS	COMPLETED	01 September 2013	DELAY IN SECURING OPERATIONAL WINDOW	FAILURE	TIME	SUCCESS	

APPENDIX 2: COLLECTED DATA FROM QUESTIONNAIRES

QUESTIONS	RESPONDENT'S DATA	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	TOTAL
2	TOP MGT																																							1	1	1	1	1	1	6
	MIDDLE MGT	1	1		1									1		1	1		1		1	1		1								1		1	1		1									14
	SUPV							1	1	1																	1	1	1																		6
	SEN STAFF			1		1	1				1	1	1		1			1		1			1		1	1				1	1	1		1			1		1							18
	JUN STAFF																																														0
	OTHERS																																														0
3	ENGR	1	1	1	1	1	1	1		1	1	1	1	1			1	1	1		1	1	1	1	1	1	1		1	1	1	1	1			1	1	1				1			1	32
	SURVEYOR																																														0
	ACCOUNTANT																																							1			1			2
	ECONOMIST																																														0
	TECHNOLOGIST														1					1												1					1									4
	PROJ MGT EXPRT															1																			1											2
	OTHERS								1																			1													1			1		4
4	< 5YRS																																														0
	5-10YRS									1	1	1	1		1			1		1								1	1	1	1		1			1		1							14
	10-15 YRS					1	1	1																	1	1	1													1		1	1		1	10
	15-25 YRS			1					1							1			1				1					1						1			1				1			1		10
	>25 YRS	1	1		1									1			1				1	1		1							1			1											10
5	< 5 PROJECTS																																									1			1	2
	5-10 PROJECTS					1		1	1	1		1			1					1					1		1	1	1		1			1					1							14
	10-15 PROJECTS			1			1				1		1						1				1			1				1		1						1								10
	15-25 PROJECTS	1														1		1			1													1		1										6
	>25 PROJECTS		1		1									1			1					1		1							1			1					1	1		1	1		12
6	PROJECT MGR		1		1									1		1			1			1		1							1		1			1				1			1		12
	PROJECT TEAM MEMBER		1	1	1	1	1	1	1	1	1	1	1	1		1		1	1	1		1	1	1	1	1	1	1	1	1	1	1		1		1	1	1							32
	CONSULTANT								1																			1													1			1		4
	PROJECT OWNER														1		1		1														1		1		1		1				1			8
	OTHERS	1																			1																									2

APPENDIX 3: SAMPLE QUESTIONNAIRE

AHMADU BELLO UNIVERSITY, ZARIA
FACULTY OF ENGINEERING
DEPARTMENT OF MECHANICAL ENGINEERING
RESEARCH QUESTIONNAIRE

Dear Respondent,

I am a postgraduate student of the above named institution, conducting a research on the topic "Failure Evaluation of Engineering Projects in Nigeria, Case study of PPMC".

The research is a partial fulfilment for the award of Masters Degree (MSc) in Engineering Management. Therefore, any data obtained will be used strictly for the purpose of this research and be treated with outmost confidentiality.

Your objective assessment will be highly appreciated.

Thank you for your cooperation.

ENGR. ZAHRADDEEN M. BABANGIDA (MNSE)

SECTION A

1. Name of organisation

   (Optional)……

2. Position of respondent

Top Management	Middle Management	Supervisor	Senior Staff	Junior Staff	Others (Specify)

3. Professional discipline

Engineer	Surveyor	Accountant	Economist	Technologist	Project Management Expert	Others (Specify)

4. Number of years of professional experience

< 5 years	5-10 years	10-15 years	15-25 years	> 25 years

5. Minimum number of projects participated

< 5 projects	5-10	10-15	15-25	> 25 projects

6. Capacity(ies) in which you participated

Project Manager	Project team member	Consultant	Contractor	Project owner	Others (Specify)

SECTION B

1. Government bureaucracy affects project award and execution.

Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree

2. Poor planning is one of the factors responsible for project failures in PPMC.

Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree

3. Poor project scoping leads to variation and subsequent abandonment of the project.

Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree

4. Lack of professionalism from the contractor is one of the factors that result in the project been abandoned.

Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree

5. Corruption in the system disrupts selection of contractor in tender process.

Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree

6. Lack of proper supervision contributes to project failure.

Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree

7. PPMC's culture affects project performance.

Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree

8. Ensuring adequate control measures enhances project success.

Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree

9. Early detection of failure signs enhances timely project delivery.

Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree

10. Adequate budgeting and timely milestone payment eliminates delay in equipment delivery and ultimately improves project execution.

Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree

11. Expectations are set and managed adequately in project execution in PPMC.

Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree

12. Application of past experiences improves chances of success.

Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree

13. Project managers have high technical and managerial skills.

Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree

14. Lack of effective communication is identified as a key factor that contributes to failure of projects in PPMC.

Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree

15. Some projects suffer failure because other projects are prioritized over them.

Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree

16. Failure warning signs are disregarded by PPMC Management in project execution.

Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree

17. Management personal interest affects project performance.

Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree

18. Engagement of all stakeholders and dissemination of the right information will improve project delivery.

Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree