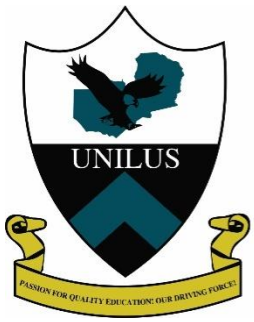

UNIVERSITY OF LUSAKA

School of Postgraduate Studies

PROJECT MANAGEMENT MATURITY LEVEL IN THE DEFENCE FORCE OF ZAMBIA - A CASE OF INFRASTRUCTURE CONSTRUCTION IN THE ZAMBIA AIR FORCE

Master of Project Management

by

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Date: 27 March 2024

DECLARATION

I, **Sunday Makasa,** Student number**: MSCPM1510821**, do hereby affirm that this research work conforms to copyright, academic writing rules and the UNILUS research ethics. The contents of this research paper are my work and have never been presented to any other higher learning institution. All material sources, in this regard, have been duly acknowledged.

Supervisor

Signature: ……

Student

Signature:

Date: 27 March, 2024

DEDICATION

I dedicate this research work to my late dear Mother Elita Charles Ngandu Bwalya Muyana who persevered and stood firm in support of our education in the midst of storms and challenges. For forfeiting her happiness in exchange for our education.

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LIST OF ACRONYMS

ADF	-	Australian Defence Force
CMMI	-	Capability Maturity Model Integration
GDP	-	Gross Domestic Product
GNP	-	Gross National Product
MoD	-	Ministry of Defence
OPMMM	-	Organizational Project Management Maturity Model
PM	-	Project Management
PMBOK	-	Project Management Body of Knowledge
PMI	-	Project Management Institute
PMML	-	Project Management Maturity Level
PMPMM	-	Project Management Processes Maturity Model
ZAF	-	Zambia Air Force
ZDF	-	Zambia Defense Force

THE ABSTRACT

This study aimed at evaluating Project Management Maturity Level of the construction directorate in the Zambia Air Force thorough assessment of Project Management processes, procedures and systems. The study adopted realism as a research philosophy and adopted both exploratory and explanatory nature of research approach. Additionally, the study employed a mixed-methods approach which combined both qualitative and quantitative data gathering methods. A total of 25 participants were purposefully selected and participated in the research. Results obtained show that, to a high extent, the Zambia Air Force applies essential and basic processes, practices, tools and techniques that are cardinal in the successful completion of projects. However, project management in ZAF faced a number of factors that hinder progress both at management and administration.

Based on the responses gathered from the respondents, the key findings in this study were that ZAF Project Management Maturity Level was found to be at Planned Level (Level 2) where Project Management processes are informally defined, Risks or problems are informally identified and Project Management data is informally collected. In other terms, both Key PM processes, Major Organisational Characteristics and Key PM Focus Areas are all informally performed. The study has helped to highlight the weaknesses associated with the practice of PM in ZAF. This is a positive step and a stepping stone towards continuous improvement of Project Management Maturity Level in ZAF.

CHAPTER ONE: INTRODUCTION

1.0 INTRODUCTION

Project Management Maturity Level is an essential aspect of any organization. It refers to the level to which an organization has developed its Project Management capabilities. Understanding the current level of organisational Project Management Maturity is crucial for the effective management of infrastructure construction projects (Seymour, 2014).

Thierauf (2011) stated that Project Management practices play a critical role in the success of construction projects. He further mentioned that construction industry is one of the largest industries globally, and it faces numerous challenges in delivering projects within the stipulated timelines and budget. To address these challenges, construction companies adopt Project Management practices to facilitate efficient and effective project delivery. However, the degree of Project Management Maturity achieved can vary based on various factors, such as organisational culture, resources, and leadership.

The PMML is very important in the construction industry and economy of Zambia. Cheelo and Liebenthal (2020) stated that construction industry is a major employer, providing jobs to a diverse range of skilled and unskilled workers. Currently, the construction industry contributes approximately 9.3 per cent of the GDP, with an average employment rate of 3.8 per cent of the workforce (Cheelo and Liebenthal, 2020). Despite it's important contribution to construction industry, very few studies have been conducted to assess the PMML of different construction organisations in the country.

Therefore, this research aims at investigating and determining the Project Management Maturity Level in the Defence Force of Zambia, specifically focusing on infrastructure construction in the Zambia Air Force. This chapter will cover research background, the statement of the problem, will look at the research objectives, scope, research motivation and will end with defining the research key terms.

1.1 RESEARCH BACKGROUND

According to Al Tahat (2014), he described Project Management Maturity Level as an estimation of a company's capability to deliver and manage projects successfully and enhance project outcomes consistently over time. It can refer to an extent to which a

specific PM process is explicitly defined, managed, measured, controlled and is effective. Cooke-Davies (2005) defined Organizational Project Management Maturity Level as the extent to which an organisation has explicitly and consistently deployed PM processes that are documented, managed, measured, controlled and continually improved. PMI (2003) stated that Project Management Maturity Level involves the level of sophistication that indicates the state of organisation's current Project Management practices and processes.

Project Management has been practiced for as long as humanity inhabited the earth. There are many examples in history of challenging Projects that were successfully completed, despite all the complexities and uncertainties. Many of the projects demanded an enormous workforce, large scope, many years of work, advanced planning and precise execution. Regrettably, despite all of these immense achievements, very little documentation of their methods, tools and techniques exists. Worse more, nothing was so far document on the PMML that these organisations or group of people could have possessed. It was not until the 1950s that organizations started to apply methodical PM tools and techniques to complex projects (Seymour, 2014).

Andoh-Baidoo et al. (2016) recognised the role that Project Management and its corresponding level of maturity contribute to specifically and especially construction projects. Jekale (2004) observed that construction industry plays a significant role in the economy of any country in the world. It plays a major role in the development and achievement of the goals of society, making it the largest industry contributing to about 10% of the Gross National Product (GNP) in industrialized countries. In many developing countries, major construction activities account for about 80% of the total capital assets, 10 % of their GDP, and more than 50% of the wealth invested in fixed assets. In addition, the industry provides high employment opportunity (Jekale, 2004). For an organisation to achieve this success in construction there should be a corresponding maturity level of PM that a particular organisation could have attained.

Construction projects undergo a number of phases characterised by many tasks aimed at identifying, planning, designing and constructing the proposed facility (Chan et al., 2004). Rodrigo (2019) stated that the construction industry is dynamic, diverse and of critical importance to the country's economy and our way of life and that it also plays an important role in the direct and indirect growth of the country's Gross Domestic Product.

It generates tax revenues for direct investment, income, large investments from local and international sources which is good for the country's economy. However, Rodrigo, (2019) bemoaned the fact that despite the construction's contribution to the nation's economy Project Management tools and techniques are not fully applied resulting in project failure. Construction in general, plays a critical role in the construction industry of developing countries. There is probably no sector that has significant implications on the daily lives of human other than the construction industry. It is universally accepted that for instance, the wells and bore holes where human beings get water as a source of life, the buildings where we live and work, the roads and bridges we drive on, the utility distribution systems we use, the railways, airports, ferries and harbors we travel and trade from, dams and power lines that give us electricity, are all products of this vital industry (Rodrigo, 2019).

Project Management Body of Knowledge (PMBOK) is the main theory that has been employed in assessing the PMML of an organisation. The theory defines the Project Management standards, best practices and outlines set of processes, knowledge areas and principles that guide Project Managers in successfully planning, executing, monitoring and closing of projects. It identifies five process groups (initiating, planning, executing, monitoring and controlling, and closing) as being essential in managing of projects. It further identifies ten knowledge areas (integration, scope, time, cost, quality, resource, communication, risk, procurement, and stakeholder management) that Project Managers must be proficient in (Kerzner, 2017).

Thierauf (2011) bemoaned the fact that PM in the construction industry of developing countries still remained generally low. As long as the maturity level of applying Project Management in the construction industry remains low, nations will not be able to benefit from the advantages that come with fully maturity level of Project Management. Zulu and Chileshe (2008) investigated contractor performance in Zambia and found it below expectations, arguing that nothing can be learned from local ongoing projects that have not been completed or have been delayed. They concluded that contractors' poor performance had huge implications on competitiveness. The construction industry being a key sector in the development and economic growth of Zambia has not escaped the challenges facing other countries worldwide in terms of delivering construction projects on time, at a rightful cost with required quality. Ofori (2006) studied the client dissatisfaction factors in South Africa's building industry and found poor workmanship

and contractor incompetence to be the main factors affecting project performance. Furthermore, customer satisfaction was found to be one of the factors affecting contractor performance and reputation.

A study on Project Management Maturity Level in the Australian Defence Force (ADF) revealed that despite the unique nature of construction projects in the military, there is a need for a structured and consistent approach to project management in the ADF (Heaton and Orr, 2018). This approach can also be significant to the Zambia Air Force. Another study of Project Management Maturity in Jordanian government organisations revealed that the Jordanian military is in the beginner stage of Project Management Maturity. The study suggested that the Jordanian Armed Forces do not have a project management framework or a specific plan for the management of their projects (Al Tahat, 2014). This observation may be relevant to the Zambia Air Force and the Zambia Defence Force in general.

1.2 STATEMENT OF THE PROBLEM

The construction industry is a highly complex and dynamic sector that requires effective Project Management practices to ensure successful project delivery PMI (2021). A number of studies have shown that lack of implementation of PM results in project failures. For instance, PMI (2021) observed that 14% of projects undertaken in developing countries fail due to poor project planning. While Hubspot (2020) surveyed and found that 39% of employees in various projects felt that inadequate communication was the biggest obstacle in completing project work. KPMG (2021) stated that cost overruns were a common issue in Project Management, with several factors such as scope creep, delays, and poor resource utilization contributing to cost increases. They further established that only 31% of the total projects undertaken were completed within the original and planned budget. Standish Group (2018) also pointed out that due to limited implementation of PM practices, only 30% of projects are completed within their original timeline.

A study published in the International Journal of Engineering and Technology in 2019 titled "Developing Countries Construction Industry, Performance Factors and Challenges" identified various factors that affect project performance in developing countries. Among them were lack of proper PM practices, lack of skilled workforce, corruption and political instability. The report further stated that poor project performance is a widespread issue in the construction industry in developing countries,

and there is a need for effective policies, institutional frameworks, and capacity-building measures to address these challenges (Bukhari, S. T., & Khan, A., 2019). Kamata et al. (2019) observed that the Ministry of Defence in Zambia is responsible for the management of the Zambia Air Force (ZAF). Their study on Project Management Maturity in the Zambia Defense Force (ZDF) revealed that the ZDF has low maturity in Project Management practices. The study recommended that the ZDF should focus on developing and implementing Project Management policies, procedures, and guidelines. This would help to improve the process of monitoring and evaluation and enhance effective Project Management.

Having established how lack of PM practices affect the construction industry and the critical role it plays in the successful completion of construction projects, it is imperative to undertake an institutional audit of Project Management that is systematic, sustainable and that is focused at finding ways of improving organisational Project Management. Although there is some literature available on Project Management Maturity Levels in the construction industry, there is a lack of research on this topic in the context of the Defense Force of Zambia. So far, in the Zambia Air Force Construction directorate no research has been conducted to look at the PMML and if left unresearched, there would be no room for improvement. It is from this background and problem that this qualitative research is undertaken to evaluate the Project Management Maturity Level of the construction directorate in the Zambia Air Force and see how Project Management practices can be improved upon. This thesis research is undertaken by doing the foundational work of determining the current status of Project Management, where it needs to go and possibly how to get there.

1.3 MAIN OBJECTIVE OF THE STUDY

To evaluate Project Management Maturity Level of the construction directorate in the Zambia Air Force through assessment of Project Management processes, procedures, and systems.

1.4 SPECIFIC OBJECTIVES OF THE STUDY

1. To measure the level and application of processes, practices, tools and techniques under each of PMBOK‟s Project Management knowledge areas in the construction directorate of Zambia Air Force.

2. To identify and analyze the factors that affects the application of Project Management practices in the construction directorate of Zambia Air Force.

3. To assess the level of alignment between ZAF Project Management processes, procedures and systems with best practices, industry standards, and other relevant Project Management frameworks.

1.5 MAIN RESEARCH QUESTION

What is the Project Management Maturity Level for the construction directorate in the Zambia Air Force and how best can Project Management processes and practices be improved upon?

1.6 RESEARCH QUESTIONS

1. To what extent are the processes, practices, tools and techniques under each of the 6th PMBOK‟s Project Management knowledge areas being applied in the construction directorate of Zambia Air Force?

2. What are the factors affecting the application of Project Management in the construction directorate of Zambia Air Force?

3. How much alignment is there between ZAF Project Management processes, procedures and systems with best practices, industry standards and other relevant Project Management frameworks?

4. What recommendations could be proposed to improve the efficiency, effectiveness and sustainability of ZAF Project Management practices, with a focus on increasing Project Management Maturity Level?

1.7 SIGNIFICANCE OF THE STUDY

The significance of the research is anchored on the benefits emanating from evaluating Project Management Maturity Level in the Construction Directorate of the Zambia Air Force. Merriam (2009) stated that evaluating of organisational Project Management Maturity Level initiate a chain reaction of positive effects as follows:

a. The findings of the study assist organisations in trying to identify strengths and weaknesses in Project Management practices. It further leads to recommendations that improve Project Management Maturity Level, enabling organisations to optimize project performance, reduce costs, and minimize risks.

b. The research findings will be significant to project managers in understanding the critical aspects of project management. They will also provide valuable insights into the best practices used in Project Management, helping them achieve greater success in their projects.

c. The study will bridge a gap in the literature on Project Management Maturity Levels in the construction industry. Though there are various studies on Project Management Maturity Levels in other industries, not much has been done in the construction industry, which often involves high-risk projects.

d. The results of the study will provide opportunities for further research in the area of Project Management Maturity Levels in the construction industry.

1.8 RESEARCH MOTIVATION

I decided to do this thesis research purposely and ambitiously for first of all to satisfy my desire to use the opportunity to help and improve the application of Project Management in the construction projects for the Zambia Air Force. My realisation was that the research topic would enable me consolidate my understanding of Project Management knowledge and its practices. Further the Maturity Level assessment of this research can serve as initial benchmark information in prioritising, designing improvement action and identifying gaps in the application of Project Management in ZAF.

Secondly, the release of the new edition of PMBOK 7th edition equally motivated me in that the previous PMBOK represented a process-based standard. It aligned the project management discipline and function around a collection of business processes. Those business processes enabled consistent and predictable practices that could be documented, where performance against the processes could be assessed and which improvements to the process could be made to maximize efficiency and minimize threats. While effective in supporting good practice, process-based standards are prescriptive by their very nature. With project management evolving more rapidly than ever before, the process-based orientation of past editions cannot be maintained in a manner conducive to reflect the full value delivery landscape. Therefore, the 7th edition shifts to a principles-based standard to support effective project management and to focus more on intended outcomes rather than deliverables. The old PMBOK editions are not negated by the 7th edition. This shift and change motivated me to undertake this

research so that I can fully understand and appreciate the positive shift that would come with the new changes and establish the possible bridge between the old and new editions.

Thirdly, there has been lack of research on Project Management Maturity Levels in the construction industry especially for the Defence Force of Zambia. Most studies on PMML focus on other industries, such as Information Technology and manufacturing. Therefore, there is a need to evaluate project Management Maturity Levels in ZAF construction directorate which may give an insight of what is pertaining in the construction industry.

1.9 RESEARCH SCOPE

Zambia Air Force has been practicing Project Management for some time now and it was just inevitable that the evaluation of PM Maturity Level be measured against the processes and knowledge areas stipulated in the 6th edition of PMBOK. This gave true reflection of how PM has been implemented in the Zambia Air Force. The study considered five (05) Process Groups (Initiation, Planning, Executing, Monitoring & Control and Closing) and the ten (10) Project Management Knowledge Areas as the main Dependent Variables which are the main foundation blocks of Project Management Maturity Levels. The study equally looked at the Processes, Practices, Procedures, Tools and Techniques as the Mediating Variables towards achieving a certain level of maturity. Out of the many maturity models available, the study considered Capability Maturity Model for classification of maturity levels as level 1 which is Initial, Level 2 Repeatable, Level 3 Defined, Level 4 Managed and Level 5 as Optimising.

Out of the three services in the Defence Force of Zambia, Only ZAF was considered for this study. ZAF has ten Departments practicing PM in one way or the other, only General Engineering Department at Air Force Headquarters and specifically the Construction Directorate was considered. The Directorate was specifically picked due to its sole responsibility of constructing and supervising contracted infrastructures in the Zambia Air Force.

1.10 DEFINITION OF KEY TERMS

1. Project - A temporary group of activities designed to produce a unique product, service or result.

2. Project Management – The application of knowledge, skills, tools and techniques to Project activities to meet the project requirements.

3. Military Construction - Any construction, development, conversion, or extension of any kind carried out with respect to a military installation, whether to satisfy temporary or permanent requirements

4. Construction – Activities comprising of design, production, alteration, renovation, maintenance, facility management, demolition, re-cycling of building and civil engineering and supply of resources.

5. Maturity Level - The extent to which a specific process is explicitly defined, managed, measured and effectively controlled.

6. Project Management Maturity Level - Refers to the level of knowledge, skills, and experience an organization possesses in implementing project management practices.

1.11 LIMITATIONS TO THE STUDY

According to Creswell (2014), he described research limitations as the weaknesses or shortcomings of a study that may affect the interpretation and validity of the research findings. He stated that limitations can be internal to the study, such as limitations in the research design, data collection, or data analysis. Limitations can be also external to the study, such as limitations in the generalizing or applicability of the findings. In this study, the following were the limitations:

a. **Small Sample Size**. Although Morse (2015) explained that there is no fixed rule for determining the sample size and that a sample size of 10-30 participants is often used in qualitative research, this study had 25 respondents all of them are working from AHQ. Their responses and eventual findings may not be generalized to cover engineers working in ZAF but away from AHAQ.

b. **Limited Generalizability**: This study's sample characteristics, research design and data collection methods were all design to investigate the PM Maturity Level in ZAF alone. Therefore, the findings may not be applicable to the rest of the Defence Force of Zambia.

c. **Limited Funding and Time**. The study was constrained by funding and time limitations affecting the ability to conduct the study adequately.

1.12 REPORT OUTLINE

Chapter one of this report introduced the research, the background, the scope or extent of the study and the study's statement of the problem. The chapter went on to define the research objectives and finally stated the research limitations. Chapter two looked at literature review from different academic scholars, outlined the theoretical framework and stated the conceptual framework. Chapter three looked at the research methodology detailing the research design, population, sample size and the sampling techniques employed. The chapter further looked at the data collection method employed and how the data was analysed. Chapter four presented the analysis of the results while Chapter five discussed the findings. Chapter six presented the research conclusion and brought out recommendations.

1.13 SUMMARY

The chapter discussed the importance of Project Management Maturity Level in the construction industry, specifically in the Defence Force of Zambia, and the need for effective Project Management practices to ensure successful project delivery. The study aimed at evaluating the Project Management Maturity Level of the construction directorate in the Zambia Air Force and identified ways to improve Project Management practices. It covered the background, research objectives, scope, research motivation, and key terms. The study used PMBOK as the main theory to assess the PMML, considering the five process groups and ten knowledge areas. The study also looks at the factors affecting the application of Project Management practices and assesses the alignment of ZAF Project Management processes with industry standards. The study's significance lies in identifying strengths and weaknesses in Project Management practices and providing recommendations to improve efficiency, effectiveness, and sustainability while reducing costs and minimizing risks.

CHAPTER TWO: LITERATURE REVIEW

2.0 INTRODUCTION

The study aimed at evaluating the Project Management Maturity Level of the construction directorate in the Zambia Air Force through assessment of Project Management processes, procedures and systems. Numerous writers and sources have provided various definitions and explanations about projects, highlighting their distinct facets. Stanleigh (2007) described a project as being characterised by a well-defined scope, restricted resources, a diverse range of participants with varying levels of expertise and typically evolves gradually over the course of its duration

To carry out literature review for this study, key words such as Project, Project Management, Military Construction, Construction, Maturity Level and Project Management Maturity Levels were well defined. The literature was gotten from various sources and only the literature that was 15 year and below was considered for the study. The literature on Project Life Cycle, Project Management Knowledge Areas, Project Management Maturity Levels, Project Management Maturity Models, Nature and of Construction Projects on the Global Market, Project Management in Developing Countries, General condition of Project Management in developing Countries, Factors affecting Project Management in developing Countries, State of construction Project Management in Zambia, Empirical Literature, Theoretical Framework and Conceptual Framework were all analysed to determine the gaps in literature.

2.1 PROJECT LIFE CYCLE

PMBOK Guide (2017) the guide stipulate that Project Life Cycle consists of four phases namely Initiation, Planning, Execution and Closure. The initiation phase involves defining the project's purpose, objectives, scope, establishing project governance, develop a preliminary project charter, identifying stakeholders and project sponsors. The planning phase involves creating a detailed project plan that outlines the project's goals, schedule, budget, develop risk management plan and estimate resources. The guide also states that the execution phase is the process of assembling project team, allocate resources, perform project work according to the project plan, monitor and control project performance, manage changes and issues as they arise and ensure effective communication within the project team. Monitoring and Controlling Phase involves monitoring project performance against the plan, implement quality control

processes, manage risks and issues, ensure compliance with project scope, time, and cost constraints and finally make necessary adjustments to keep the project on track. The closure phase involves obtain formal acceptance of project deliverables, conduct a project review and document lessons learned, close out contracts and release resources, generate a final project report, archive project documentation and close project files. (A Guide to the Project Management Body of Knowledge, 2017).

2.2 PROJECT MANAGEMENT KNOWLEDGE AREAS

Project Management Knowledge Areas refer to the specific areas of expertise required in managing a project. The Project Management Institute (2017) identifies ten knowledge areas which play an essential role in the successful delivery of a project. These areas encompass the Project Management processes required to manage a project effectively from start to finish and they include:

a. Project Integration Management. It involves coordinating all aspects of a project, including aligning project goals with organisational objectives, developing project plans, executing plans, and managing project changes. This knowledge area requires the use of various project management tools and techniques, such as project charters, project scope statements, work breakdown structures (WBS), change control processes, and Project Management software. Effective project integration management requires good project leadership skills (PMI, 2017).

b. Project Scope Management. The knowledge area deals with defining, managing, and controlling the scope of a project. This knowledge area involves identifying project goals, objectives, deliverables, developing a project scope statement, creating a WBS, managing changes to the project scope, and controlling the scope baseline. Project managers need to have clear project goals and objectives to manage project scope effectively (PMI, 2017).

c. Project Time Management. It involves the processes required to ensure timely completion of a project. This knowledge area encompasses activities such as defining project activities, sequencing activities, estimating activity durations, developing project schedules, monitoring and controlling project schedules, and closeout activities. Effective project time management requires good project planning skills, including the ability to create realistic schedules and manage stakeholder expectations (PMI, 2017).

d. Project Cost Management. The knowledge area is the discipline of managing project costs, including planning, estimating, budgeting, financing, funding, managing, and controlling costs. This knowledge area involves activities such as cost estimates, financial analysis, cost control, and cost accounting. The project manager must have an in-depth understanding of project finances and be able to monitor project costs continuously (PMI, 2017).

e. Project Quality Management. It encompasses the process of ensuring that a project meets or exceeds the quality standards set by stakeholders. This knowledge area involves identifying quality requirements, defining quality metrics, developing a quality management plan, performing quality assurance, and controlling quality. Project managers need to understand quality management concepts and approaches to deliver quality projects (PMI, 2017).

f. Project Human Resource Management. The knowledge area involves managing the people working on a project and includes tasks such as planning project staffing needs, acquiring and developing a project team, and managing project team performance. Effective project human resource management requires the project manager to have strong interpersonal skills, including communication, motivation, and conflict resolution (PMI, 2017).

g. Project Communication Management. It involves the process of creating, distributing, storing, retrieving, and disposing of project information. This knowledge area involves identifying communication needs, developing a communication plan, managing project communications, and reporting project performance. Project managers must be able to communicate project goals and objectives, project progress and manage issues effectively (PMI, 2017).

h. Project Risk Management. The process of identifying, analyzing, and responding to project risks. This knowledge area includes risk identification, risk assessment, risk mitigation, and risk monitoring and control. Effective project risk management requires an understanding of risk management techniques and the ability to assess and manage project risk continuously (PMI, 2017).

i. Project procurement management. It involves acquiring goods and services from external sources. This knowledge area involves activities such as identifying project procurement requirements, conducting market research, conducting

procurement activities, and administering contracts. Project managers must understand contractual obligations and procurement practices (PMI, 2017).

j. Project Stakeholder Management. The knowledge area involves identifying and managing stakeholders' needs, expectations, and interests throughout the project life cycle. This knowledge area involves stakeholder identification, stakeholder analysis, stakeholder engagement, and stakeholder management. The project manager must be able to identify the stakeholders and their requirements effectively and manage expectations throughout the project (PMI, 2017).

In addition to the knowledge area, the seventh edition of PMBOK (2021) identifies Project Management principles which involves stewardship, tailoring, team, quality, stakeholders, complexity, value, risk, systems thinking, adaptability and resiliency, leadership and change. Additionally, PMBOK (2021) also identifies the project performance domains as being tailoring, stakeholders, team, development approach and life cycle, planning, project work, delivery, measurement and uncertainty. Project Management principles as well as Project performance domains are equally essential in the execution and successful completion of the project (PMBOK, 2021).

2.3 PROJECT MANAGEMENT MATURITY LEVELS

Tahat (2014) described Project Management Maturity Level as an estimation of a company's capability to deliver and manage projects successfully and enhance project outcomes consistently over time. Paulk et al. (1993) defined Project Management Maturity Level as the extent to which a specific process is explicitly defined, managed, measured, controlled and is effective. It implies a potential for growth in capability and indicates both the richness of an organisation's Project Management process and the consistency with which it is applied in projects throughout the organisation.

Cooke-Davies (2005) defined Organizational Project Management Maturity Level as the extent to which an organisation has explicitly and consistently deployed processes that are documented, managed, measured, controlled and continually improved. It is a comparative level of advancement an organisation could have achieved with regard to any given process or set of activities. He emphasized that organisations with more fully defined and actively used policies, standards, and practices are considered more mature. PMI (2003) defined Project Management Maturity Level as the level of

sophistication that indicates organisation's current project management practices and processes. The degree to which an organisation practices Project Management is measured by the ability of an organisation to successfully initiate, plan, execute, monitor and control individual projects.

2.4 PROJECT MANAGEMENT MATURITY MODELS

Kelley (2007) insisted on the fact that Project Management Maturity Models assist organizations in establishing the current Maturity Level of their Project Management practices and to improve their capabilities systematically. Kerzner (2017) stated that Project Management Maturity Models are developed to evaluate a company's current and future Project Management performance. Project Management Process Maturity Models are frameworks used to assess an Organization's Project Management Maturity Level. Pennypacker (2001) stated that the purpose of a Project Management Maturity Model is to provide a model of progressive improvement in project management systems and processes that can be used to assess an organization's capabilities and to provide an improvement path. Each maturity level determines and specifies the level of organisational adherence to application of project Management processes and procedures. There are various models and some critical ones are as tabulated below:

Table 1: Project Management Maturity Models

S/N	MATURITY MODEL DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
01	CAPABILITY MATURITY MODEL-CMM	Initial	Repeatable	Defined	Managed	Optimizing
02	PROJECT MANAGEMENT PROCESS MATURITY MODEL-PMPMM	Ad-hoc	planned	Managed at Project	Managed at corporate	Continuous learning
03	PROJECT MANAGEMENT SOLUTIONS' MATURITY MODEL - PMSMM	Initial Process	Structured Process and Standards	Organizational Standards and Institutionalized Process	Managed Processes	Optimizing Process
04	KERZNER'S PROJECT MANAGEMENT MATURITY MODEL - KPMMM	Common Language	Common Processes	Singular Methodology	Benchmarking	Continuous improvement
05	ORGANIZATIONAL PROJECT MANAGEMENT MATURITY MODEL-OPMMM	OPM3 does not explicitly assign a maturity level for organization. Maturity is assessed and reported as percentages of best practices				

2.5 THE NATURE AND CHARACTERISTICS OF CONSTRUCTION PROJECTS ON THE GLOBAL MARKET

The global management of Construction Projects has some differences from the management of other projects. The differences mainly stem from the nature and characteristics of Construction Projects. The consideration of these differences is important for successful management of Construction Projects (Jekale, 2004).

According to Singh et. Al (2016), they stated that Construction Projects have generally the following types of characteristics:

a. **Complexity**: Construction projects are among the most complex types of projects due to the multiple stakeholders, intricate design and engineering requirements, and diverse site conditions. Complexity in construction projects increases risks, cost overruns, and time delays.

b. **Size and Scale**: Construction projects can range from small residential buildings to massive infrastructure projects such as highways, bridges, or airports. The size and scale of the project can significantly affect the construction process and the overall project outcomes.

c. **Unique Location**: Construction projects are often located in unique and diverse locations, including urban areas, remote locations, or environmentally sensitive areas. These varying environments pose unique challenges such as limited access, environmental regulations and material sourcing difficulties.

d. **Time Constraints**: Time constraints are a significant characteristic of construction projects due to the need to meet project schedules and deadlines. Time is one of the most challenging project management constraints to manage in construction projects.

e. **Risk and Uncertainty**: Construction projects are inherently risky, and uncertainties such as weather, labor shortages, and unforeseen circumstances can significantly impact project outcomes. Risk management is critical in reducing the negative impacts of risk and uncertainty on construction projects.

2.6 PROJECT MANAGEMENT IN DEVELOPING COUNTRIES

The importance of Project Management is illustrated in Jakale (2004) where he stated that the majority of projects in the developing countries are developmental related.

Hence, their failure had usually far reaching effect beyond financial losses. Jakale (2004) argued that in Developing countries, failure of projects could and in most incidences resulted in death, in other incidences children's hope to go to school, hope to save many from poverty would be shattered. This is in contradiction with successes of projects in developing countries that usually lead and mean considerable contribution to improvement of lives for millions of people.

The need to uphold Project Management principles and practices cannot be over emphasised. Cusworth & Franks (1993) observed that although most Projects in both developed and developing countries are complex and operate in a dynamic environment, projects in developing countries are highly uncertain, and operate in a highly unstable, unpredictable and poorly resourced environment. This poses an extra challenge on Project Managers from developing countries which demands extra level of understanding of Project Management. The need to uphold Project Management was further emphasised by Jakale (2004) who made the comparison that Projects in Developing countries were usually public owned, dominated by mostly infrastructure projects, in most cases the projects were highly sensitive to the environment, complex, uncertain, unstable and most of the time compounded by scarce resources. On the other hand, in developed countries projects were usually private, less mix of projects, moderately sensitive to the environment, Complex, dynamic, relatively stable and to some extent existed by predictable environment and supported by adequate resources. This makes it a must for developing countries to uphold and support Project Management development and advancement.

2.7 GENERAL CONDITION OF PROJECT MANAGEMENT IN DEVELOPING COUNTRIES

Project Management in developing countries is facing many challenging problems due to non-conducive environment (Jekale, 2004). Many projects in such countries end up uncompleted, abandoned or unsustainable (Andersen, 2008). For instance, the cost of abandoned projects in Nigeria is estimated to be $12.65 billion, requiring at least twice as much additional fund for their completion (Alutu and Udhawuve, 2009). It is further believed that the implementation of most projects in developing countries is amalgamated with normal operational undertaking in functional organisations that have low capacity.

2.8 THE CONSTRUCTION INDUSTRY IN DEVELOPING COUNTRIES

The construction industry in developing countries is faced with many challenges that hamper its growth and development. According to a study by Selim and Buniyamin (2019), one of the main challenges is the lack of adequate funding for construction projects. Governments and financial institutions are often reluctant to invest in the construction industry due to its perceived high risk and low returns. This lack of funding often leads to delays in project implementation and inadequate completion. Another challenge facing the construction industry in developing countries is the lack of skilled labor. A study by Olawale and Sun Moyo (2014) found that the construction industry in Nigeria, for example, is faced with a shortage of skilled labor, leading to poor quality workmanship, project delays and increased costs. This situation is exacerbated by the limited number of construction industry training institutions in many developing countries.

Similarly, inadequate infrastructure is another major challenge facing the construction industry in developing countries. A study by Olariaga et al. (2017) found that inadequate road infrastructure can hamper the transportation of construction materials and affect the efficiency and cost of implementing construction projects. Other studies have cited inadequate regulatory frameworks, corruption, and poor governance as factors influencing the performance of the construction industry in developing countries (Ranasinghe et al., 2018; Selim and Buniyamin, 2019).

2.9 CONTRIBUTORS TO LOW PM MATURITY LEVEL IN DEVELOPING COUNTRIES

Andersen (2008) itemized some of the factors that contributed to low Project Management Maturity Level. Among them and the notable ones were corruption which posed enormous challenges and complications in fully implementing Project Management. Alutu and Udhawuve (2009) researched that in Nigeria alone projects worth of $12.65 billion were abandoned due to corruption and poor Project Management. Apart from corruption, Andersen (2008) brought out poor support infrastructures, low level of technology, low capacity of implementing institutions, scarcity of skilled professionals and financial resources, unreliable communication ,poor and protracted documentation, high turnover of leadership and workmen, considerable political instability ,low level or absence of accountability and transparency, and long

and tedious formal decision-making procedure as other contributors of low Project Management Maturity Level in developing countries.

2.10 FACTORS AFFECTING PROJECT MANAGEMENT IN DEVELOPING COUNTRIES

Idoko (2008) identified a number of factors that were deemed as main contributors poor project performance in developing countries. These factors included:

a. Government Policies
b. Insufficient Funds
c. Withdrawal by Donors
d. Shortage of Foreign Exchange
e. Inappropriate Contract Conditions
f. Political Priorities
g. Poverty
h. Socio-Cultural Conditions
i. Corruption
j. Low Institutional and Human Capacity
k. Occurrence of unexpected events such as wars and droughts

Jekale (2004) too observed that projects in developing countries were highly influenced by external environment. He stated that project environment in many developing countries were unstable and characterized by rapid change of markets, shift of funding sources, frequent change of government policies and the business environment. In addition, he pointed out that projects in those countries were affected by prevalence of corruption, war, drought and governments political priorities. He illustrated that in Nigeria, the cost of construction materials was reported to had shown a 400% increase over a period of two years because of change in government policies.

Sonuga et al, (2002) bemoaned lack of institutional capacity and trained personnel as the main reasons why projects failed in developing countries. He further observed that in developing countries lack of awareness about the benefit and application of Project Management was equally a contributing factor to poor project performance. Lack of trained project managers and wrong perception that sees project managers as an unnecessary expense contributed to the low level of development of project management in developing countries. Idoko (2008) pointed out that the presence of only three (03) Project Management Institute (PMI) chapters in African countries attest to the

seriousness, value and attention given to Project Management in developing countries. Another important reason for failure of projects in developing countries is the way projects are generally set up and implemented. There is total lack of involvement and consultation with the end users which in turn renders the projects irrelevant. This is coupled by the fact that project donors have the tendency of financing projects they perceived as important for the recipient rather than basing the implementation of projects on the needs of the end users This is in addition to lack of comprehensive project planning and study by Project Managers (Andersen, 2008). Cusworth and Franks (1993) explained that the environment in developing countries does not foster the application of project management and hence there should be need to change and make the environment conducive and more favorable for flourishing of Project Management.

Project management is being embraced, to some extent, by most organisations as the best way to develop and deliver new or improved products, services, and organisational process changes (Cleland and Ireland, 2002). It has been a continuous effort by researchers and practitioners to look for ways to develop and improve organisations Project Management capability so as to benefit from the benefits of Project Management. The improvement of Project Management capability of an organisation can be realised in many different ways which may include but not limited to training, mentoring, benchmarking, routine use of new tools, techniques and many developed Maturity Models. Project Management Maturity Models are just one such means that organisations can use in their pursuit to improving their Project Management capabilities (Davies, 2005). Cleland and Ireland (2002) suggested that the use of Maturity Models provides a frame work for purposeful and progressive development of Project Management capability for delivering successful projects. Generally, Maturity Models help an organisation know how mature its Project Management practice is. It helps the organisation measure the degree to which it is executing Project Management and in addition, Maturity Models help frame improvement efforts by identifying priority areas and suggesting areas of improvement (Man, 2007).

2.11 STATE OF CONSTRUCTION PROJECT MANAGEMENT IN ZAMBIA

According to Moonga et al., (2013), they emphasized that there is need for construction project management in Zambia to adopt international best practices and standards. The study reported that the construction industry in Zambia faces several challenges that

adversely affect the performance of projects, including inadequate institutional capacity, lack of skilled personnel, inadequate financing, and lack of adherence to regulations.

A more recent study by Moonga et al., (2019) evaluated the professional regulation and enforcement in the construction industry in Zambia. The study identified the lack of clear regulations and guidelines on construction project management as a significant challenge. It was noted that the lack of regulations may lead to non-adherence to best practices and standards in the construction industry. The government of Zambia has taken steps to address the challenges facing the construction industry and promote effective project management. For example, the government has developed regulations to promote the use of local materials in construction projects, which could improve construction industry quality and sustainability. Additionally, the National Council for Construction (NCC) is responsible for ensuring the adherence to best practices and standards in the construction industry (Moonga et al., 2019).

2.12 EMPIRICAL LITERATURE

Project Management Maturity Models have gained significant attention in the literature as a means of evaluating and improving an organization's Project Management practices. According to Project Management Institute (2017), maturity is the ability of an organization to deliver projects with increasing efficiency and effectiveness by adhering to PM practices. With the increase in the complexity of construction projects, Project Management Maturity Models have become increasingly relevant in the construction industry. Many studies have acknowledged the benefits that Project Management Maturity Models have added which among others include increase in project success, improved project performance, and the establishment of best practices (Creswell, 2014).

In the context of the defense force of Zambia, the need to improve Project Management practices is of utmost importance, given the magnitude of technical and logistical considerations involved in the Defence infrastructure construction. A case study by Mwansa (2017) on Project Management Maturity Level in the Defense Force of Zambia found that despite a positive Project Management culture, there was overall need to improve processes such as stakeholder management, risk management, monitoring and control processes. Additionally, studies have noted that the use of Project Management Maturity Models can aid in assessing and improving Project Management Maturity Levels in defense organizations. For example, Sherer and Sadler (2019)

studied the application of the Project Management Maturity Model in the US Army, finding that the model could be used to benchmark current practices, identify areas of improvement, and ensure effective Project Management.

Overall, the literature review highlights the importance of Project Management Maturity Levels, particularly in the defense force of Zambia's infrastructure construction projects. The studies suggest that the use of Project Management Maturity Models can aid in assessing and improving Project Management practices. However, the significant challenges faced by the Zambia Defence Force in achieving Project Management Maturity Levels, include lack of Project Management skills, resource constraints, and leadership commitment need to be addressed. The need for appropriate training, awareness, and leadership commitment is vital to improve Project Management Maturity Levels and cannot be over emphasised.

2.13 THEORETICAL FRAMEWORK

The research for Evaluating of the Project Management Maturity Level for Construction Directorate in the Zambia Air Force was anchored on the theoretical context of Project Management Body of Knowledge (PMBOK) 6th edition 2017. It defines the Project Management standards, best practices and outlines set of processes, knowledge areas and principles that guide Project Managers in successfully planning, executing, monitoring and closing of projects. It identifies five process groups (initiating, planning, executing, monitoring and controlling, and closing) as being essential in managing of projects. It further identifies ten knowledge areas (integration, scope, time, cost, quality, resource, communication, risk, procurement, and stakeholder management) that Project Managers must be proficient in (Kerzner, 2017).

The research additionally took advantage and was aligned to following additional theories:

a. Theory of Planning

According to PMBOK (2021), Project Planning generally takes into consideration various factors such as the environment, stakeholders, decision-making process, communication channels, and implementation strategies in an effort to ensure that planning process is well-designed, effective and appropriate in context. The planning of projects is generally described from the point of view of different knowledge areas in the PMBOK Guide. The planning processes are structured into core processes and

facilitating processes. There are ten core processes namely scope planning, scope definition, activity definition, resource planning, activity sequencing, activity duration estimating, cost estimating, schedule development, cost budgeting and project plan development. The output from these processes, the project plans, make up an input to the executing processes.

b. Theory of execution

Executing in Project Management focus on how to put project plans into action to achieve project goals efficiently and effectively. It encompasses the importance of resource allocation and management in achieving project success. It emphasises the effective resource management as a key to achieving competitive advantage and that organisations must focus on aligning resources with their strategic goals. It is equally concerned with identifying and eliminating constraints or bottlenecks to improve overall system performance. In Project Management, this can be applied to identify and address constraints that prevent the project from progressing. It also brings out the fact that critical path in Project Management is not necessarily the most critical because it assumes that all tasks are of equal priority. It suggests that resources should be allocated to focus on the critical chain, which considers resource dependencies and availability (Leach, 2014).

c. Theory of controlling

According to Davis (2019), controlling of projects is an essential aspect of management that involves establishing standards, measuring results, comparing actual performance with standards, and taking corrective action where necessary. The process helps to ensure that organisational goals and objectives are met efficiently and effectively. It includes feedback control which views the control process as a closed-loop feedback system. This means that feedback is used to monitor and adjust the organisation's performance to achieve the desired results. The feedback can be gotten from various sources such as customers, employees, suppliers, and other stakeholders. Controlling of projects can equally make use of cybernetic control which views the control process as a cybernetic system, meaning that it involves interrelated feedback loops that are designed to maintain system stability and performance. Behavioral control of projects emphasizes the role of human behavior in the control process. It suggests that people's

attitudes, motivation, and skills play a significant role in shaping performance outcomes. Therefore, managers need to focus on developing a positive work environment that encourages employee engagement, motivation, and commitment. Output control of projects theory focuses on the outputs of an organization rather than its inputs. It suggests that the best way to control an organization's performance is by setting clear and measurable performance standards and holding individuals or teams accountable for achieving them

2.14 CONCEPTUAL FRAMEWORK

Project Management Processes Maturity Model (PMPMM) classifies the Organisation's PM Maturity Level into Ad-hoc which is a Level 1, planned a Level 2, managed at Project Level a Level 3, Managed at Corporate Level a Level 4 and Continuous Learning Level which is referred to as Level 5. Capability Maturity Model (CMM) classifies Organisation's PM Maturity Level into initial as Level 1, Repeatable as Level 2, Defined Level 3, Managed as Level 4 and Optimized as Level 5. These levels translate into how much a particular Organisation embraces and enforces the application of PM practices, tools and techniques (Paltrinieri et al., 2014). Below is the graphical representation of the conceptual framework:

Graphical Representation of The Conceptual Framework

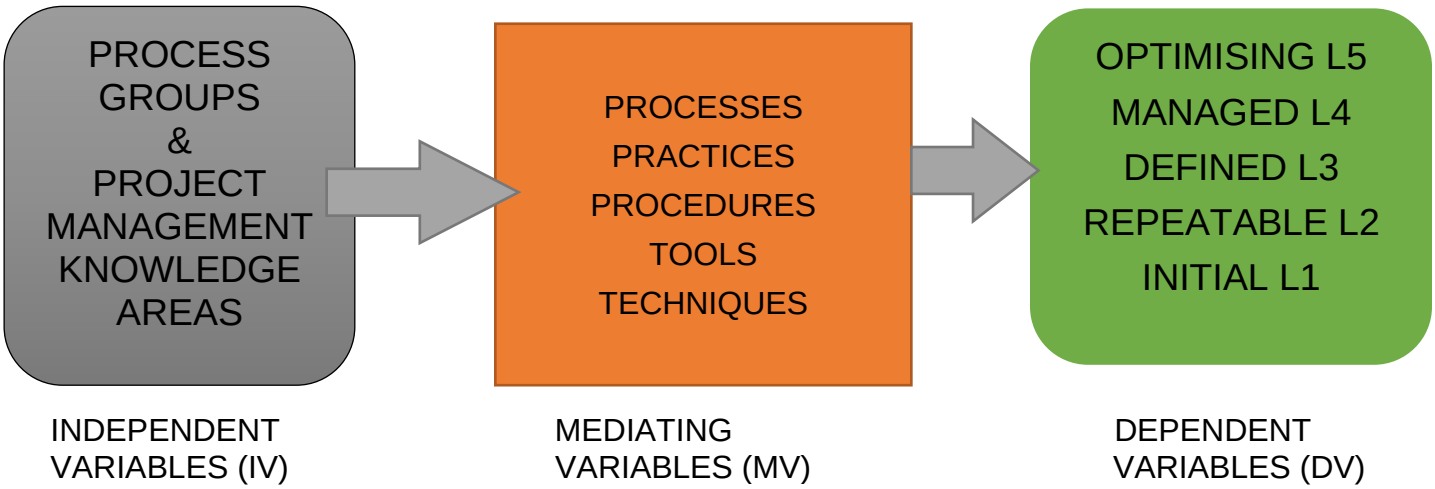

Figure 1: Representation of the Conceptual Framework

2.15 SUMMARY

The study aims to evaluate the Project Management Maturity Level of the construction directorate in the Zambia Air Force through an assessment of project management processes, procedures, and systems. The literature review covers various topics such as project life cycle, project management knowledge areas, project management maturity levels, project management maturity models, the nature and characteristics of construction projects on the global market, project management in developing countries, general condition of project management in developing countries, factors affecting project management in developing countries, the state of construction project management in Zambia, empirical literature, theoretical framework, and conceptual framework. The research is anchored on the theoretical context of Project Management Body of Knowledge (PMBOK) 6th edition 2017, and other project management-related theories. The conceptual framework of this study includes different levels of Project Management Maturity Models that organizations can use to improve their project management capabilities and achieve competitive advantage.

CHAPTER THREE: METHODOLOGY

3.0 INTRODUCTION

The purpose of this research was to evaluate the level of Project Management Maturity (PMM) in the construction directorate of Zambia Air Force (ZAF). The research approach involved assessing the application of processes, practices, tools, and techniques under each of PMBOK's Project Management knowledge areas. The study adopted both exploratory and explanatory research approaches, along with a mixed-methods approach consisting of qualitative and quantitative data gathering methods. The study population comprised 25 engineers and technicians under the nominal roll for the construction directorate at ZAF AHQ, with purposive sampling techniques employed. Data collection measures included semi-structured questionnaires, in-depth interviews, and document analysis. Descriptive statistics and content analysis were used for data analysis. The study aimed to provide insight into the challenges and opportunities associated with the current PMM level in the construction directorate of ZAF and suggest strategies to improve it. Validity and reliability of the study were ensured while observing ethical considerations in research.

3.1 RESEARCH APPROACH

The main purpose of this research was to evaluate Project Management Maturity Level in the construction directorate of Zambia Air Force. This was done by assessing the extent to which processes, practices, tools and techniques under each of PMBOK‟s Project Management knowledge areas were being applied. Additional objectives were to investigate factors that affected the application of project management in the construction directorate of Zambia Air Force. Thereafter, this study proposed ideas necessary in improving the application of Project Management in ZAF. These objectives were achieved by reviewing literature on Project Management, Construction and Maturity Levels Models. This was enhanced with structured interviews and questionnaires that helped classify the processes, practices, tools and techniques.

Arising from the above, the study adopted realism as a research philosophy based on the fact that there is a real, objective world that exists independently of human perception or interpretation. Reality of Project Management Maturity Level in ZAF exists whether we are aware of it or not, and it can be studied scientifically. The study equally adopted both deduction and induction as research approach as the data used in

drawing the findings were obtained from interviews, questionnaires and supported by the theories from literature.

3.2 RESEARCH DESIGN

Research design refers to the overall plan or strategy for conducting a research project and achieving the objectives of the study. It involves selecting the research methods, designing the data collection tools, determining the sample size, selecting the sample, and analyzing the data collected (Creswell 2014). The following were considered in coming up with the research design for the study:

3.2.1 **Nature of Research**. A study can adopt either exploratory, descriptive, explanatory or the combination. According to Creswell (2014), he stated that Exploratory Research can be used when the researcher does not have a clear understanding of the research problem or when the researcher seeks to gain a better understanding of the research problems. He further suggested that Descriptive Research can be used to describe the characteristics of a phenomenon, event, or group in trying to answering who, what, when, where, and how of the research problems. He further stated that Explanatory Research can be used to determine the cause-and-effect relationships between variables. It is used to identify and understand the underlying factors that contribute to a particular phenomenon or event (Creswell, 2014). Therefore, this study adopted both Exploratory and Explanatory Research approach in trying to answer the research problems.

3.2.2 **Methodological Choice**. Out of the three known Methodological Choices (Qualitative, Quantitative and Mixed Methods), this study implored a mixed-methods approach which combined both qualitative and quantitative data gathering methods. The qualitative method was utilised in soliciting for information from Project Management practitioners in the Air Force, including project managers, construction managers, engineers, and architects. The quantitative method was utilised in assessing the ZAF Project Management Process Maturity Level.

3.2.3 **Research Strategies**. According to Mark Saunders et, al. (2012), he stated that there are a number of research strategies that a researcher can adopt among them are Experimental, Survey, Archival Research, Case Study, Mixed

Methods, Ethnography, Action Research, Grounded Theory and Narrative Inquiry. This study adopted the Case Study as a Research Strategy focusing on ZAF as an organization in the Defence Force of Zambia with an effort to generate rich, detailed and contextualized information related to the topic.

3.2.4 **Time Horizon**. The study adopted Cross-Sectional study and carried out a snapshot capture of what is currently prevailing in ZAF in terms of Project Management Maturity Level.

3.3 STUDY POPULATION

Twenty Five (25) Engineers and technicians under the nominal roll for the construction directorate at ZAF AHQ were considered in this research. The decision to limit the population to engineers and technicians under construction directorate emanated from the fact that these technocrats undertake, participate and foresee large construction projects in the Zambia Air Force. Hence any significant improvement will highly contribute to the overall improvement of Project Management application and project performance. Additionally, these personnel were viewed to possess Project Management knowledge and understanding to some extent and degree. Construction engineers from other services within the Defence Force of Zambia were excluded from the research due to time constraint.

3.4 SAMPLE SIZE

Morse (2015) explained that there is no fixed rule for determining the sample size in qualitative research studies. He however stated that a sample size of 10-30 participants is often used in qualitative research studies. In this study, it was assumed that the required data for the research could be entirely obtained from the population. Therefore, engineers that took part in the research were selected based on a nominal roll for the General Engineering Department. A total of 25 participants were purposefully selected and participated in the research.

3.5 SAMPLING TECHNIQUES

Non probability specifically purposefully sampling technique was used in this study. It was assumed that the required data for the research could be entirely obtained from the population. This was done bearing in mind that the respondents should have vast

knowledge, professional competency and understanding of construction and Project Management (Creswell, 2014).

3.6 DATA COLLECTION/INSTRUMENTS

According to Hampson et al. (2014), questionnaires and interviews are effective in studying the actual issues in the industry and the findings can be construed from the actual experience and views. For this reason, questionnaires and interview guides were used to collect data in this study. Questionnaire and interview guides were developed for engineering professionals in works directorate who are involved in construction activities in ZAF. A Semi-structured questionnaire was administered to engineers under construction directorate to generate detailed information on how Project Management was applied to construction projects. This questionnaire was administered through the *Survey Monkey* software. In-depth interviews were also conducted to collect data. These were directed at respondents who have worked as Project Managers on construction projects. Non-directive style of interviewing using open-ended questions was employed to allow for participants to have the freedom to control the pacing of the interview and provide quality information as much as possible. Participants were allowed to seek clarification when they did not understand the question for better responses. Literature from PMBOK and other sources was thoroughly reviewed to generate more information on the application of Project management. Additionally, document analysis was employed by reviewing the Project Management documents used in the construction activities which may include project plans, progress reports, communication logs, financial reports and risk assessments (Gibbs, 2007).

3.7 DATA ANALYSIS

Robles (2012) stated that by combining both Descriptive Statistics and Content Analysis, data can be analysed effectively and research questions can be answered conclusively. He further stated that the two methods can make it easier to present the data graphically in form of charts and tables making it easier to comprehend the findings. For the purpose of this study, Descriptive Statistics were used to summarize the responses obtained from the questionnaires. Frequencies and percentages were automatically computed by *Survey Monkey* software for each research question. This led and contributed to determining the current Project Management Maturity Level in the area of infrastructure construction in Zambia Air Force. The responses also helped in identify the challenges and opportunities associated with the current Project

Management Maturity Level. On the other hand, Content Analysis was used to identify themes, trends, and patterns in the data collected from the interviews. The recorded interviews were transcribed, and the transcripts were reviewed systematically to identify recurring themes. This process involved reviewing the data for commonalities and differences, grouping similar ideas into categories, and developing themes that emerge from the data. This approach helped in identifying possible strategies for improving the Project Management Maturity Level in the construction directorate of the of the Zambia Air Force.

3.8 VALIDITY AND RELIABILITY

In order to ensure that the data collected was reflective of the research objectives and that the analysis was carried out systematically and consistently, Validity and Reliability of the study analysis was carried. This ensured credibility of the findings. Validity established the degree to which the research findings reflected the actual Maturity Level of Project Management in the Zambia Air Force. While Reliability established that the findings were consistent with multiple administrations of the research instruments. Hair et al. (2014) established that, in order to test for validity, the researcher can either use Face Validity, Content Validity or Construct Validity. They equally stated that to test for reliability, the researcher can use Test-Retest Reliability, Internal Consistency Reliability and Inter-Rater Reliability. For the purpose of this research the Content Validity and Test-Retest Reliability was used.

3.9 ETHICAL CONSIDERATIONS

Permission to conduct this research was sought from the Zambia Air Force leadership. Interviews were conducted after thorough self-introduction of the researcher to the respondents. The purpose of the study was made known to the respondents and participation in the study was voluntary. The anonymity, rights, needs, values and desires of respondents were equally respected and all forms of respondents' identification involving names, addresses and telephone numbers were avoided. In addition to what has been stated above, the following were implemented in an effort to safeguard the participant's rights:

a. Participants were advised in writing of the voluntary nature of their participation and that they could withdraw from the study at any time without any reparations. They

were also advised that at any time during the process they could decline to answer any of the question they were not comfortable with.

b. The research objectives were clearly outlined in writing and articulated to the participants.

c. The participants were informed of all data collection methods and activities.

d. Provisions were made for monitoring the data collected to ensure the safety of participants.

e. The participant's rights, interests and wishes were considered as first priority when making choices regarding data to be reported.

3.10 SUMMARY

The research aimed to evaluate the level of Project Management Maturity (PMM) in the construction directorate of Zambia Air Force (ZAF) through an assessment of the application of processes, practices, tools, and techniques under each of PMBOK's Project Management knowledge areas. Both exploratory and explanatory research approaches were adopted, along with a mixed-methods approach consisting of qualitative and quantitative data gathering methods. The study population consisted of 25 engineers and technicians under the nominal roll for the construction directorate at ZAF AHQ, with purposive sampling techniques employed. Data collection measures included semi-structured questionnaires, in-depth interviews, and document analysis. Descriptive statistics and content analysis were used for data analysis. The study design aimed to ensure validity and reliability while observing ethical considerations in research. The findings aimed to provide insight into the challenges and opportunities associated with the current PMM level in the construction directorate of ZAF and suggest strategies to improve it.

CHAPTER FOUR: PRESENTATION AND ANALYSIS OF RESULTS

4.0 INTRODUCTION

This chapter presents the research findings and the analysis of the information obtained from the study in accordance with the research objectives. The findings are presented according to the respective subheadings in line with the study's research objectives. The findings relate to the questions which were probed in the questionnaires and the interview schedule in the study.

4.1 RESPONSE RATE

The response rate for this study indicated to be 100% (n=25). This entails that all the 25 targeted participants participated in this study and the findings were analysed.

4.1.1 Section A: Demographic characteristics of respondents

In the part of the questionnaire, respondents were asked about their profile. Therefore, variables of gender, age, years of experience as a project manager, number of projects they have spearheaded, if they undertook any Project Management related training, highest level of education they have received as well as if they are certified Project Management practitioner. The respondents were asked in the questionnaire in order to know the characteristics of the respondents as they do play a pivotal role in this study.

4.1.1.1 Gender of the respondents

The result in figure 1 below presents the gender of the respondents. The majority 86% of the respondents were male whereas the least 14% were female. This implies that Project Management in ZAF is largely characterised by male employees.

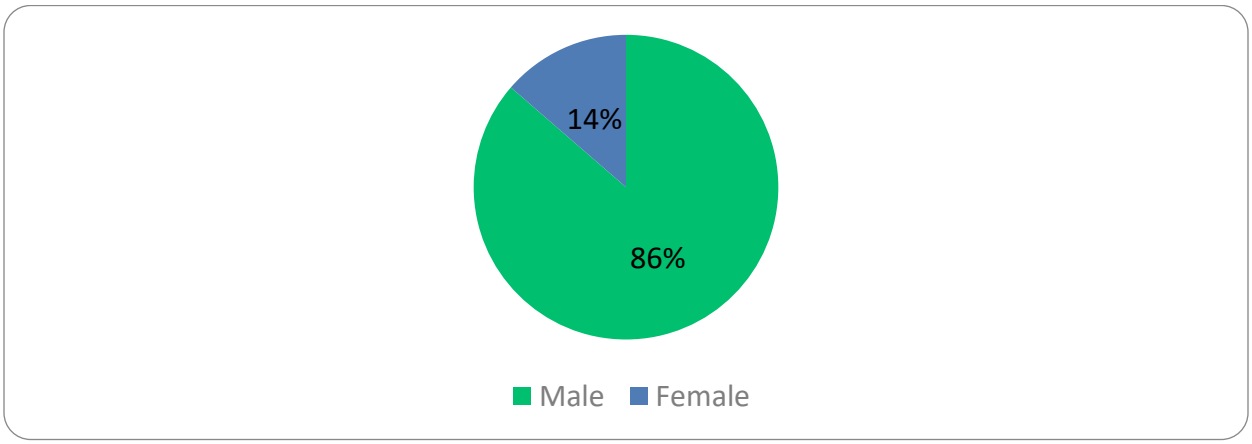

Figure 1: Percent Distribution of respondents by gender

4.1.1.2 Age of respondents

The findings in figure 2 below shows that most 55% of the respondents fell in the age bracket of 31- 40 years, followed by 27% of the respondents being in age 41-50 years, 14% were in age 51 years and above whereas the least 5% of the respondents were in age 20-30 years old.

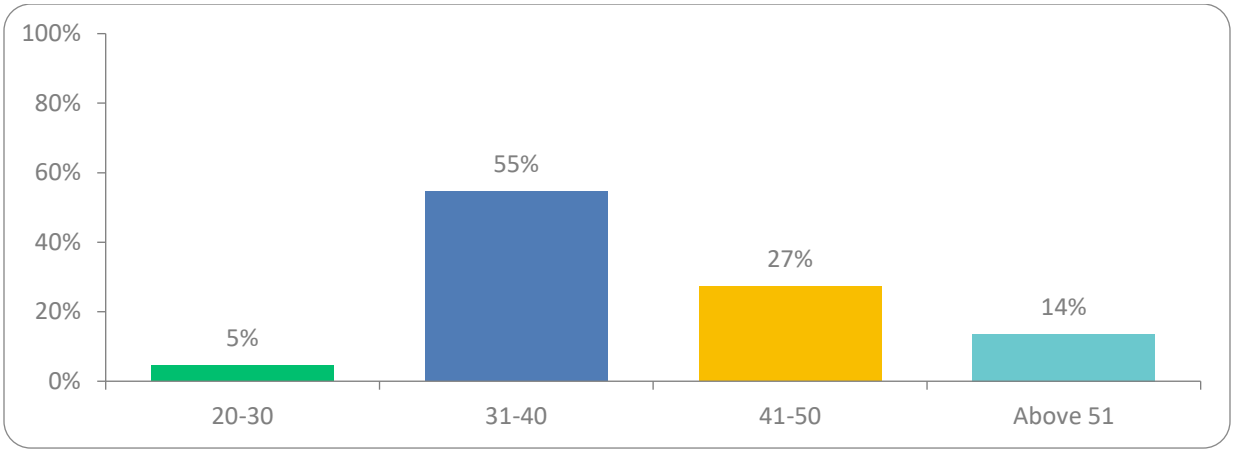

Figure 3: Distribution of respondents by age

4.1.1.3 Length of service (Years of experience)

The respondents were asked to indicate their years of experience as Project Managers. The results in figure 3 below shows that, 41% of the respondents had experience of between 6 -10 years, 27% of the respondents had experience of above 16 years, 23% of the respondents had experience below5 years whereas least 9% of the respondents had years of experience between 11-15 years.

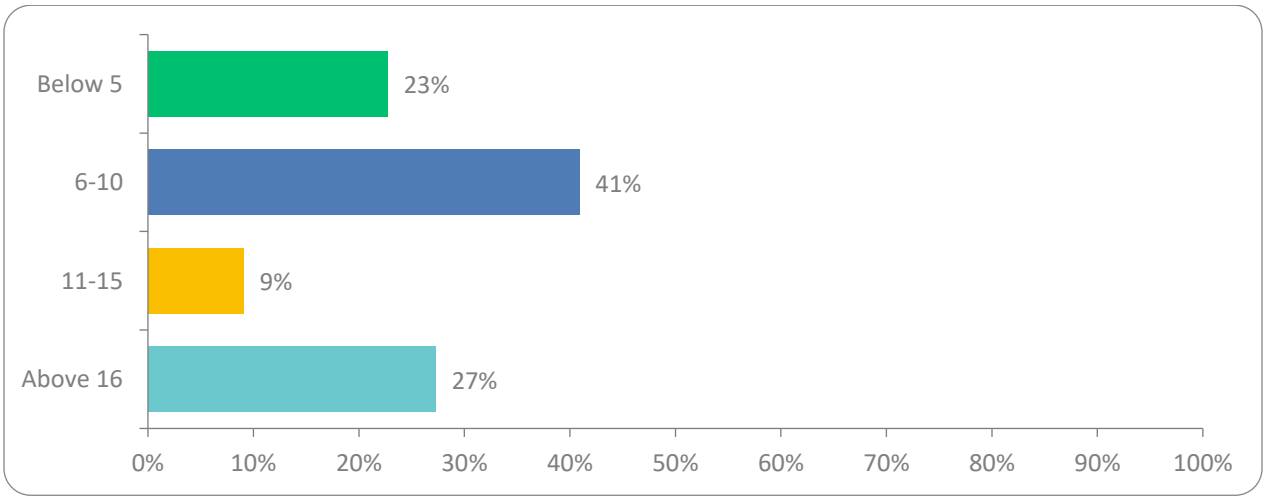

Figure 4: Percent distribution of respondents by years of experience

4.1.1.4 Number of projects spearheaded

Respondents were asked to state the number of projects they have spearheaded. Figure 4 below show that the least 18% of the respondents spearheaded below 5 projects. The majority 41% spearheaded between 6 to 10 projects while the other 41% of the respondents spearheaded over 10 projects.

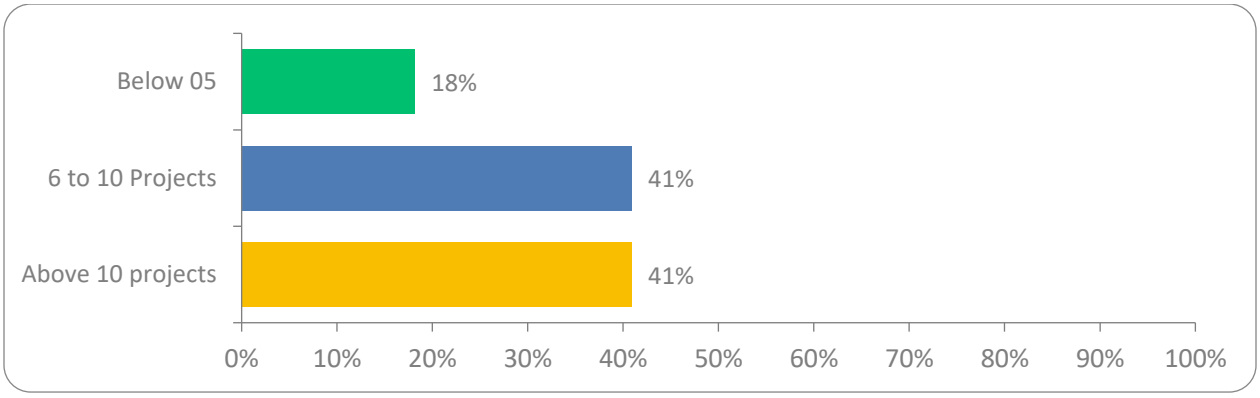

***Figure 5: Number of projects spearheaded*.**

4.1.1.5 Project Management related training

Responded were asked if they undertook any project management related training. Figure 5 below illustrates that the majority 77% of the respondents indicated Yes while the least 23% indicated No.

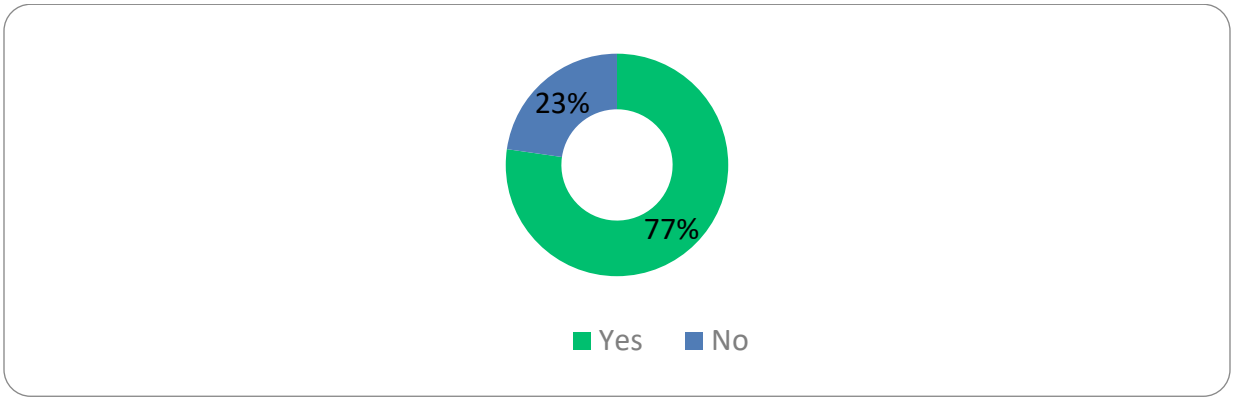

Figure 6: Rate of respondents who undertook any project management related training

4.1.1.6 Highest level of training received

Respondents who said that they undertook project management trainings were asked to indicate the highest level of training received. The majority 29% indicated Bachelors level while the other 29% of the respondents indicated a course in a related program or field of study. 14% of the respondents indicated that they received a short-term training. 10% of the respondents indicated Diploma level while the other 10% had specific answers. 5% indicated a certificate while the other 5% of the respondents indicated Masters level of project management training.

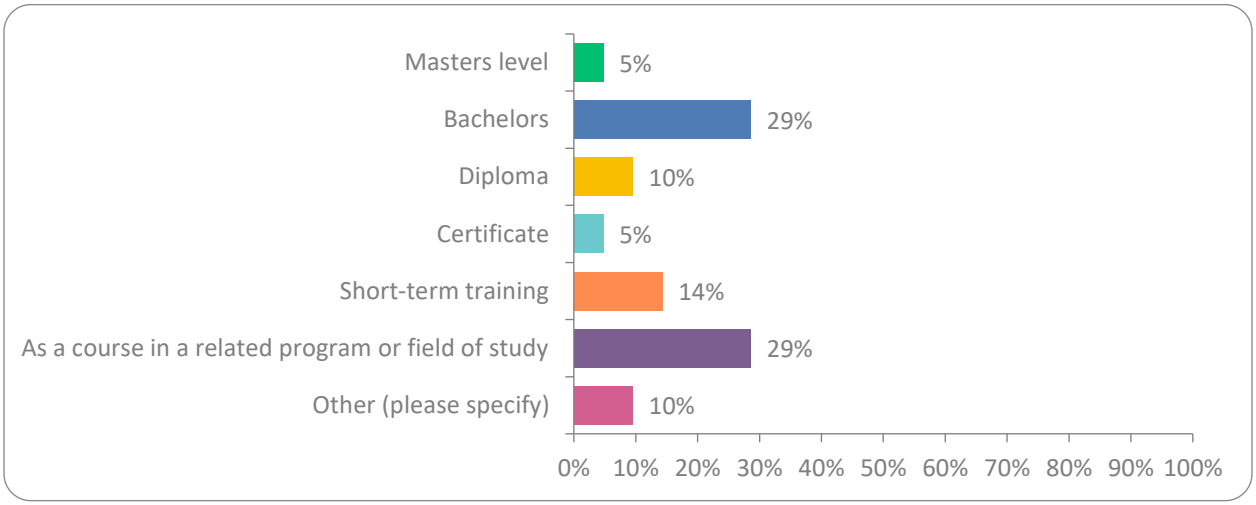

Figure 7: Level of training received by respondents

4.1.1.7 Certified Project Management practitioner

Respondents were asked if they were certified Project Management practitioners. Figure 7 below shows that the majority 82% of the respondents indicated Yes whereas the least 18% of the respondents indicated No.

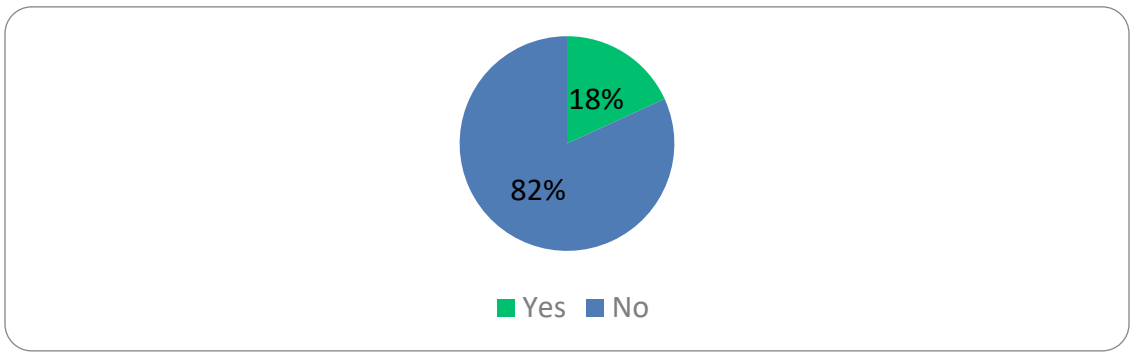

Figure 8: Rate of certification of project management of respondents

4.1.1.8 Level of certification

Respondents who indicated that they were certified Project Management practitioners were asked the level of certification. The Majority, 50% of the respondents indicated Project Management Institute Certification while the other 50% specified their answers. Figure 8 below illustrates the results.

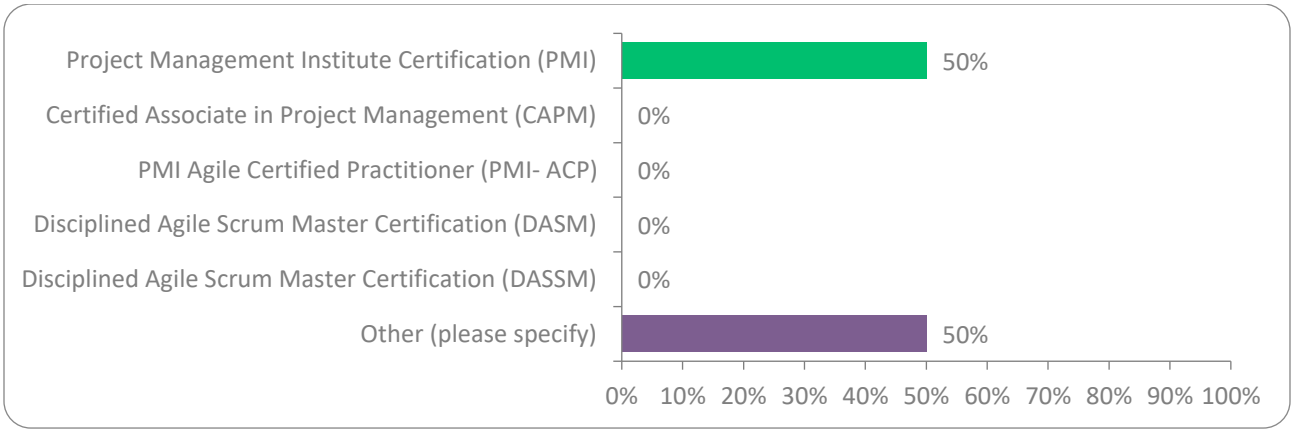

Figure 9: Level of project management certification

4.1.2 SectionB: The Extent of Application of Project Management Processes, Practices, Tools and Techniques

This section focused on processes, practices, tools and techniques that are cardinal in the successful completion of projects. Respondents were asked the extent to which they agreed with the processes, practices, tools and techniques that were listed. Values were assigned to choices that were presented to respondents. Choices were; Strongly Agree [5], Agree [4], neither agree nor disagree [3], Disagree [2], Strongly Disagree [1].

Mean that is less than 1.50 implied that on average the statement was affirmative to a very low extent. Mean that is greater than 1.50 but less or equal to 2.50 implied that on average the statement was affirmative to a low extent. Means greater than 2.50 but less or equal to 3.50 implied that on average the statement was affirmative to a moderate extent. Furthermore, mean greater than 3.50 but less or equal to 4.50 implied that on average the statement was affirmative to a high extent while mean greater than 4.50 implied that on average the statement was affirmative to a very high extent.

On the other hand, the standard deviation (SD) shows the distribution of the responses in relation to the mean. It indicates how far the individual responses to each statement vary from the mean. SD of 1 implies that the responses are further spread out. SD that

is greater than 0.5 and less than 1, shows that the responses are moderately distributed, while less than 0.5 indicates that they are concentrated around the mean. SD that is greater than 1 indicate a substantial variation from the mean, demonstrating no consensus on the responses obtained.

4.1.2.1 Coordination of Project Activities

Respondents were asked to rate the extent to which they agree that project activities were all well-coordinated to ensure alignment with project objectives and goals in ZAF. The results in figure 9 below show that the majority, 48% of the respondents agreed while 24% strongly agreed. 19% of the respondents neither agreed nor disagreed. Only 10% of the respondents disagreed. On average, respondents indicated that in ZAF, project activities werehighly coordinated to ensure alignment with project objectives and goals as depicted by the mean of 3.9 and solidified by the SD of 0.91.

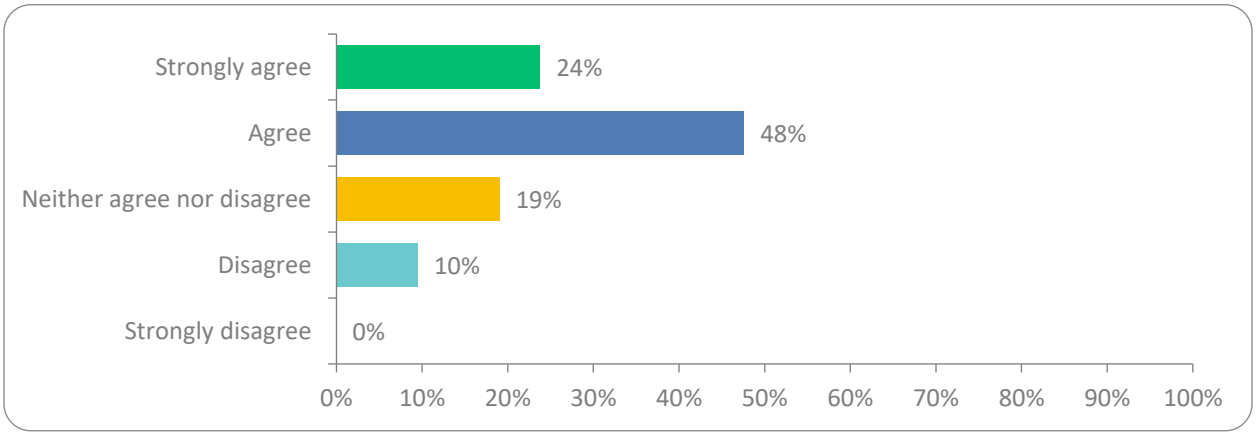

Figure 10: Project activities are all well-Coordinated to ensure alignment with project objectives and goals.

4.1.2.2 Project Scopes

When respondents were asked to rate the extent to which project scopes were well defined, controlled and validated, the majority 52% of the respondents agreed where as 19% strongly agreed. The other 19% neither agreed nor disagreed. Only 10% of the respondents disagreed while no respondent strongly disagreed. These results indicate that project scopes werehighly well defined, controlled and validated in ZAF as evidenced by the mean of 3.8 and further solidified by the SD of 0.87.

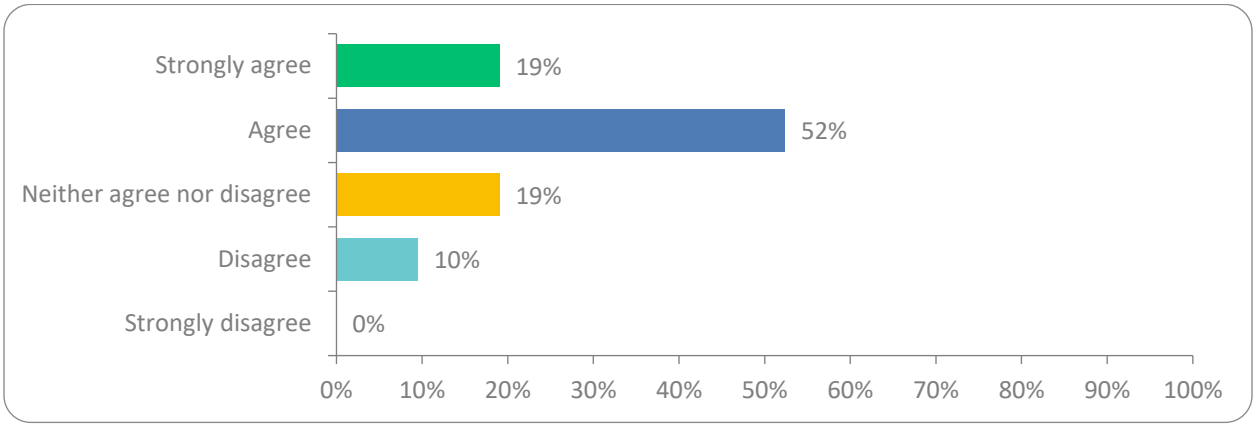

Figure 11: Project scopes are well defined, controlled and validated

4.1.2.3 Scheduling of project activities

Respondents were asked the extent to which they agree that project activities were scheduled and there was effort to ensure they were completed on time. The Majority, 52% of the respondents agreed while 29% strongly agreed. 5% of the respondents neither agreed nor disagreed whereas 14% of the respondents disagreed. No respondent strongly disagreed. On average, respondents agreed that in ZAF project activities werehighly scheduled and there was effort to ensure they were completed on time as depicted by mean of4.0 and SD of 0.97.

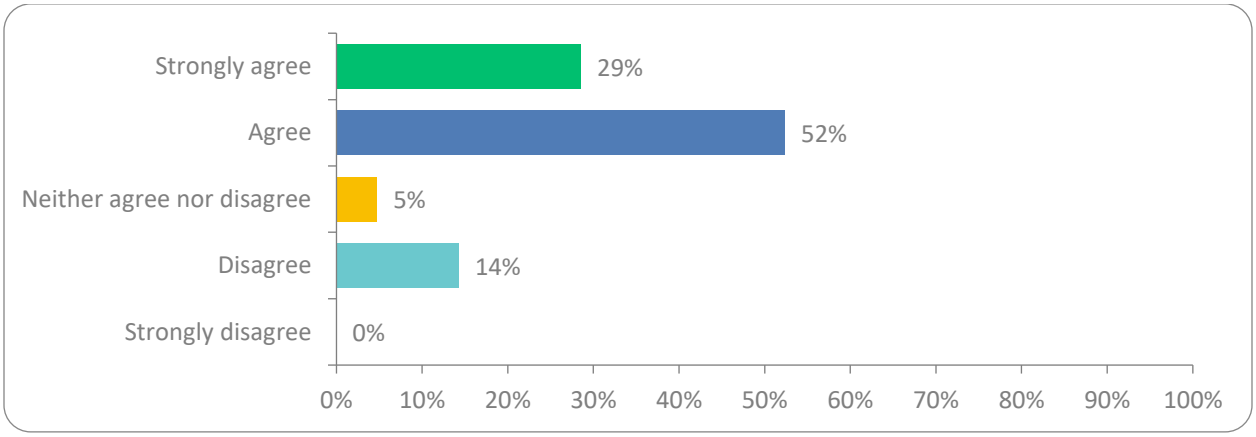

Figure 12: Project activities are scheduled and there is effort to ensure they are completed on time

4.1.2.4 Project budget

Respondents were asked the rate to which they agreed that every project had project budget which was used for cost control. The majority, 48% of the respondents agreed while 38% strongly agreed. However, 10% of the respondents disagreed while 5%

neither agreed nor disagreed. No respondent strongly disagreed with the statement. These results indicate that on average, every project highly had project budget which was used for cost control in ZAF as represented by the mean of 4.1 and SD of 0.91.

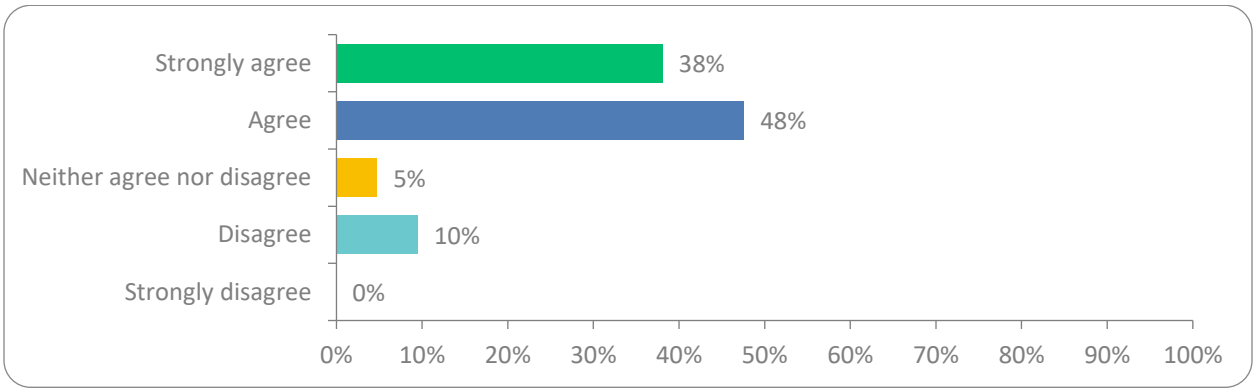

Figure 13: Every project has project budget which is used for cost control

4.1.2.5 Project deliverables

When asked if project deliverables always met quality standards and client expectations, majority 43% of the respondents agreed while 33% neither agreed nor disagreed. 19% of the respondents disagreed whereas 5% of the respondents strongly agreed to the statement. No respondent strongly disagreed. On average, these results indicate that project deliverables always moderatelymet quality standards and client expectations as represented by the mean of 3.3 and SD of 0.86.

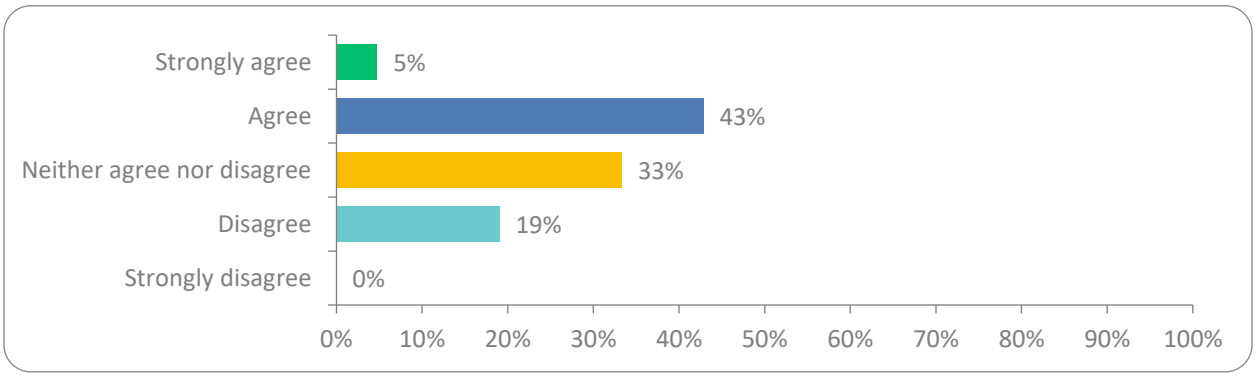

Figure 14: Project deliverables always meet quality standards and client expectations.

4.1.2.6 Recruiting, training and general management of the project team members.

Respondent were asked the extent to which they agree that the project manager was responsible for recruiting, training and general management of the project team members. The majority, 50% of the respondents agreed whereas 5% strongly agreed. 18% neither agreed nor disagreed. However, 23% of the respondents disagreed while 5% strongly disagreed. These results indicate that in ZAF, on average project managers were responsible for recruiting, training and general management of the project team members to a moderate extent as depicted by mean of 3.3. The SD of 1.03 demonstrate lack of consensus on the responses obtained due to substantial variation from the mean.

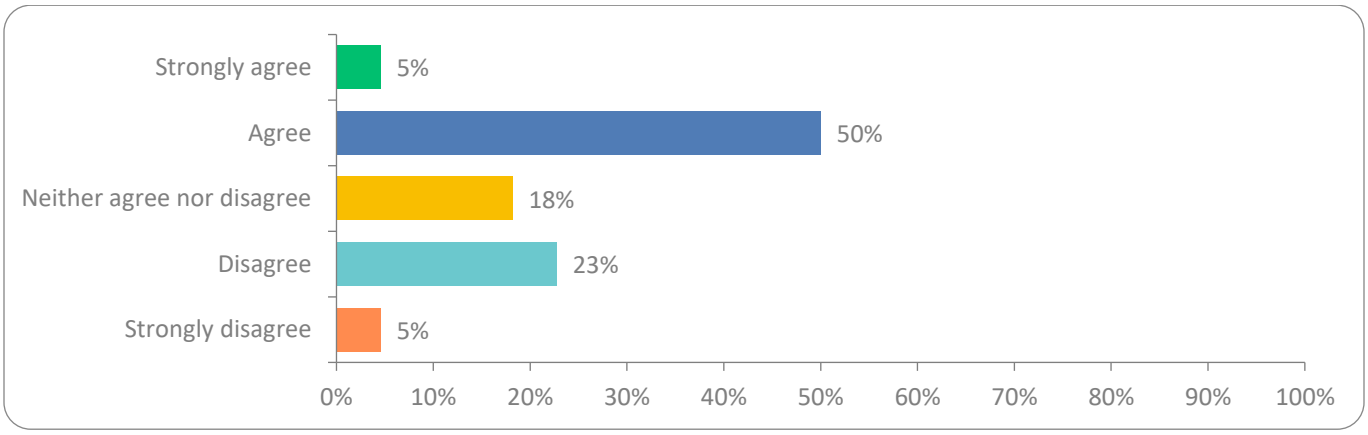

Figure 15: The project manager is responsible for recruiting, training and general management of the project team members

4.1.2.7 Effective communication with stakeholders

Respondents were asked the extent to which they agreed that there was effective communication within the project and among project stakeholders. Figure 15 below illustrates that the majority 55% of the respondents agreed while 18% strongly agreed. 23% of the respondents neither agreed nor disagreed while 5% disagreed. No respondent strongly disagreed with the statement. On average, effective communication within the project and among project stakeholders in ZAF is high as represented by mean of 3.9 and solidified by SD of 0.77.

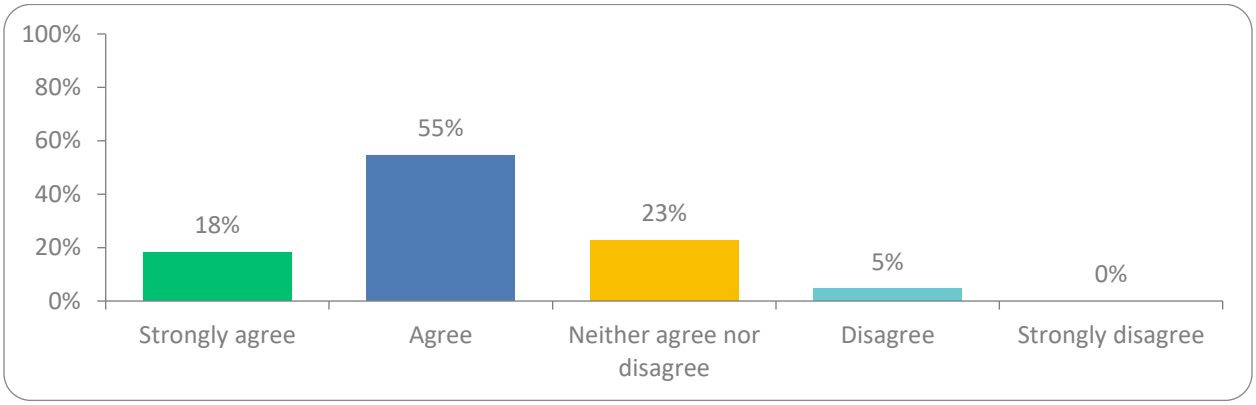

Figure 16: There is effective communication within the project and among project stakeholders.

4.1.2.8 Identification, assessment and mitigation of project risks

When asked the extent to which they agreed thatfor every project, project risks were always identified, assessed and mitigated, majority, 45% of the respondents agreed while 14% strongly agreed. 27% of the respondents neither agreed nor disagreed. However, 14% of the respondents disagreed with the statement. No respondent strongly disagreed. These results indicate that on average in ZAF every project, project risks were always highly identified, assessed and mitigated as seen by the mean of 3.6. This was further cemented by the SD of 0.91.

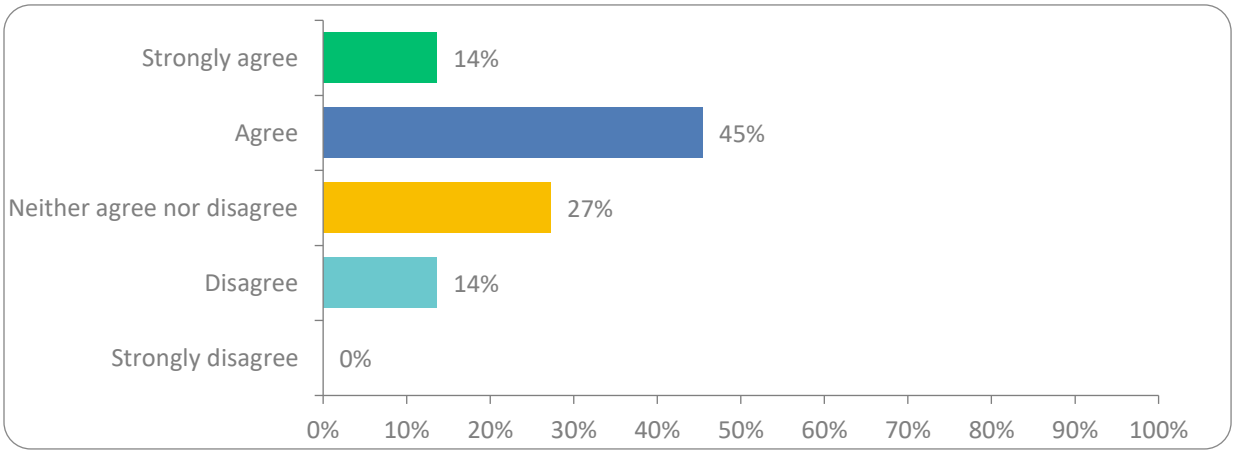

Figure 17: For every project, project risks are always identified, assessed and mitigated

4.1.2.9 Procurement and management of external resources and contracts

Respondents were asked the extent to which they agreed that there wasformal procurement and management of external resources and contracts. Figure 17 below illustrates that the majority 68% of the respondents agreed while 14% of the respondents strongly agreed. Only 18% of the respondents neither agreed nor disagreed. There were no respondents who disagreed or strongly disagreed with the statement. These results demonstrate that in ZAF, formal procurement and Management of external resources and contracts were high as depicted by mean of 3.6 and SD of 0.91.

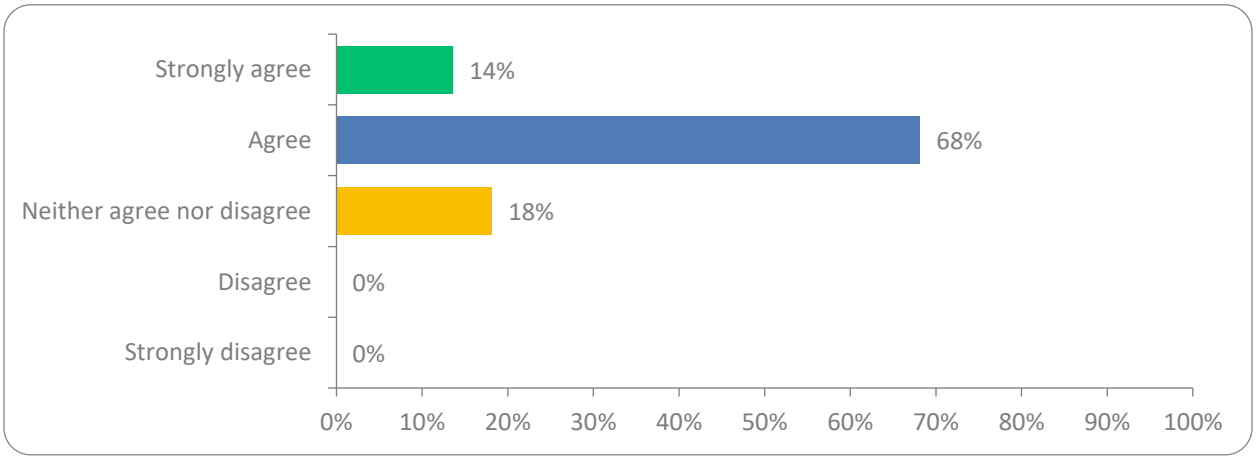

Figure 18: There is formal procurement and Management of external resources and contracts.

4.1.3.0 Identification and management of needs and expectations of stakeholders

When asked the extent to which they agree that project stakeholders' needs and expectations were always identified and managed, results from figure 18 below indicate a tie. 36% of the respondents agreed while the other 36% neither agreed nor disagreed. 14% of the respondents strongly disagreed whereas the other 14% disagreed. No respondent strongly disagreed with the statement. The results obtained indicate that on average, in ZAF project stakeholders' needs and expectations werealways moderately identified and managed as noted by the mean of 3.5 and SD of 0.91.

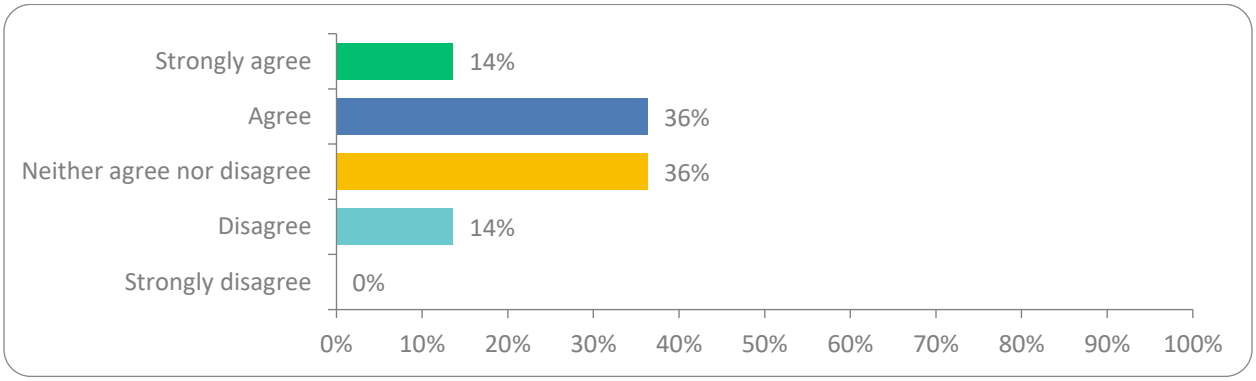

Figure 19: Project stakeholders' needs and expectations are always identified and managed.

From the interviews, majority of the respondents indicated that time, quality requirements, cost, procurement, human resource, stakeholder management, scope as well as risk management were the most consistent Project Management knowledge areas in ZAF. As recounted by one respondent who holds a senior management position:

"*I think in the Zambia Air Force, the areas that I can testify as consistently being applied in every project that I have personally supervised include I think time as you know where I am where we determine the project schedules also the quality requirements, procurement of project materials, project cost related issues, maybe also human resource where we recruit the required people with necessary skills and also maybe on the scope where we determine the extent of work required on the project"*

– Respondent 2

4.1.3 Section C – Factors Affecting the Application of Project Management

This section of the questionnaire brought out project factors that could affect the application of Project Management in the Zambia Air Force. Respondents were asked based on their knowledge of practice of Project Management in ZAF, to answer particular questions. Values were assigned to choices that were presented to respondents. Choices were; yes [3], No [2] and I do not know [1].

Mean that is less than 1.50 implied that on average the statement was affirmative to a very low extent. Mean that is greater than 1.5 but less or equal to 2.0 signified that the statement was affirmative to a low extent. Mean greater than 2.0 but less or equal to

2.5 indicated that the statement was on average affirmative to a high extent while mean that is greater than 2.5 implied that the statement was affirmative to a very high extent.

Meanwhile, the standard deviation (SD) shows the distribution of the responses in relation to the mean. It indicates how far the individual responses to each statement vary from the mean. SD of 1 implies that the responses are further spread out. SD that is greater than 0.5 and less than 1, shows that the responses are moderately distributed, while less than 0.5 indicates that they are concentrated around the mean. SD that is greater than 1 indicate a substantial variation from the mean, demonstrating no consensus on the responses obtained.

4.1.3.1 Recognition of needs and benefits of project Management

Respondents were asked if the need and benefit of Project Management was recognised by top leadership in ZAF. Figure 18 below shows that the majority, 81% of the respondents indicated yes. In contrast, 14% indicated of the respondents indicated no while 5% indicated that they did not know. These results indicate that the need and benefit of Project Management was very highlyrecognised by top leadership in ZAF as evidenced by mean of 2.8 and SD of 0.54.

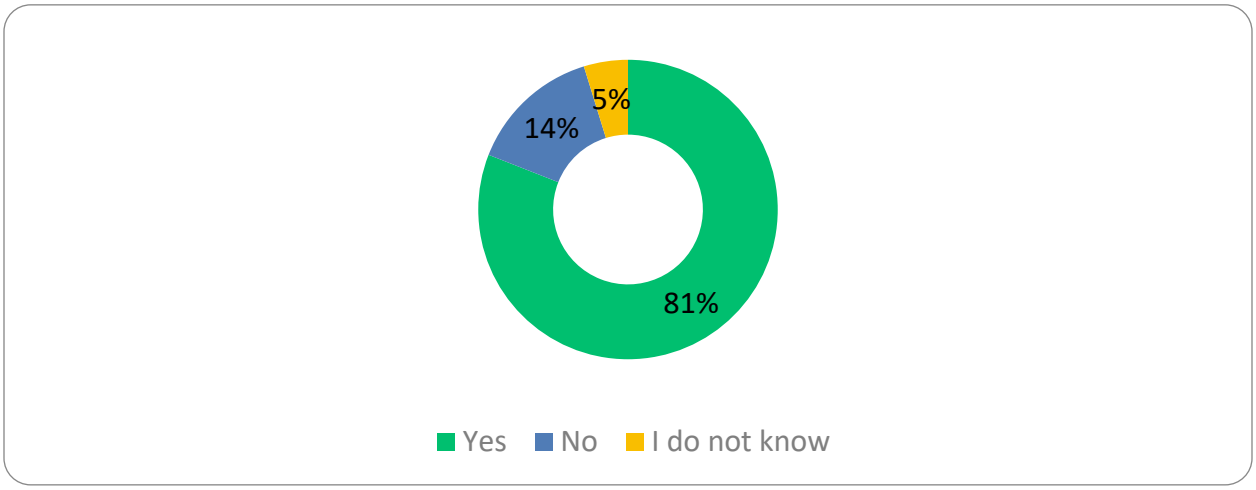

Figure 20: Recognition of needs and benefits of project Management in ZAF

4.1.3.2 Provision of support for Project Management development

Respondents were asked if ZAF's management provided support for Project Management development. Results in figure 20 below indicate that the majority, 67% of the respondents indicated yes. However, 24% of the respondents indicated no whereas 10% indicated that they did not know. These results demonstrate that the management

of ZAF provided support for project management development to a very high extent as depicted by the mean of 2.6 and SD of 0.68.

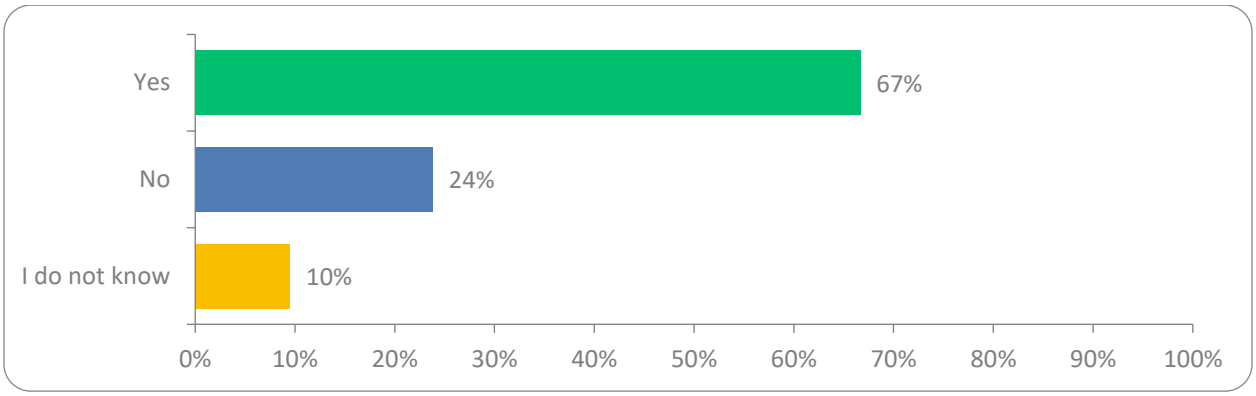

Figure 21: Does your organisation's management provide support for Project Management development?

4.1.3.3 Organisational central Project Management office

When asked if ZAF had a central Project Management office that provided Project Management support for the Projects, majority 52% of the respondents indicated yes. However, 38% of the respondents indicated no whereas 10% indicated that they did not know. These results indicate that ZAF had a central Project Management office that provided Project Management support for the Projects to a high extent as seen by the mean of 2.4 and SD of 0.68.

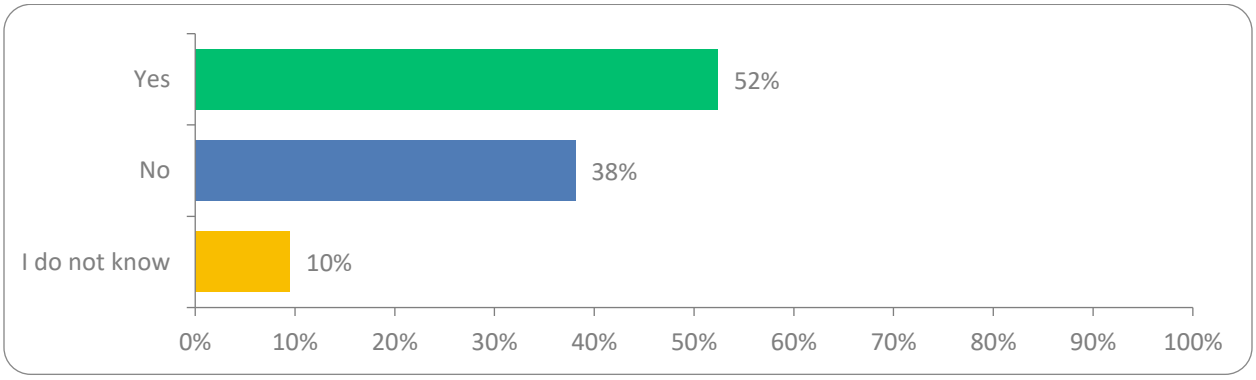

Figure 22: Does your organisation have a central Project Management office that provides Project Management support for the Projects?

4.1.3.4 Standard Project Management processes and methodologies

Respondents were asked if ZAF had standard Project Management processes and methodologies. Majority, 48% of the respondents indicated no. In contrast, 43% of the respondents indicated yes while 10% indicated that they did not know. These results signify that on average, ZAF had standard Project Management processes and methodologies to a high extent as depicted by the mean of 2.3. However, the SD of 0.66 show moderate consensus on the average answer.

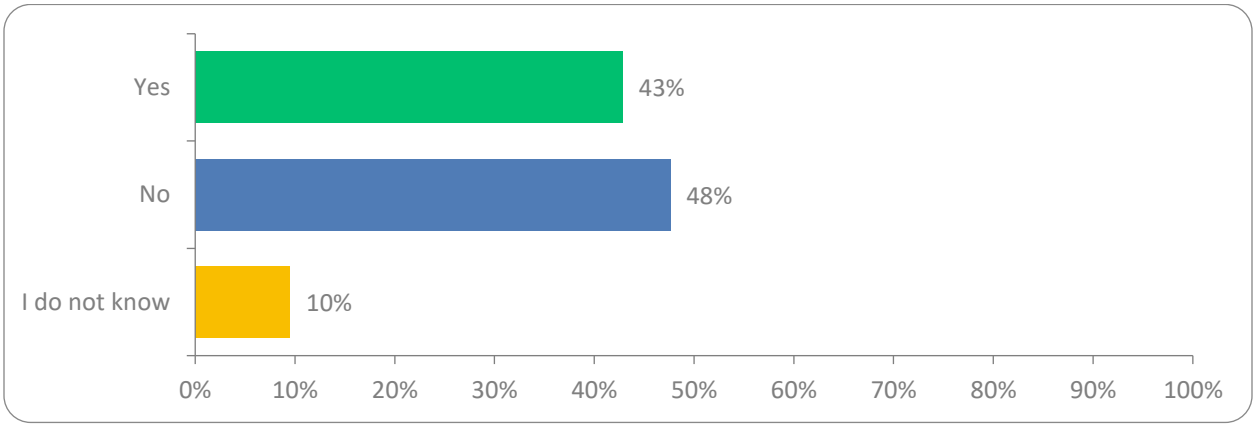

Figure 23: Does your organisation have standard Project Management processes and methodologies?

4.1.3.5 Solid knowledge base of Project Management in ZAF by Project Managers.

Respondents were asked if Project Managers in ZAF had solid knowledge base of Project Management. Majority, 38% of the respondents indicated yes. However, 33% indicated that they did not know while 29% indicated no. These results signify that on average, Project Managers in ZAF had solid knowledge base of Project Management to a low extent as depicted by the mean of 2.0. Yet, SD of 0.86 represent moderate consensus on the average answer.

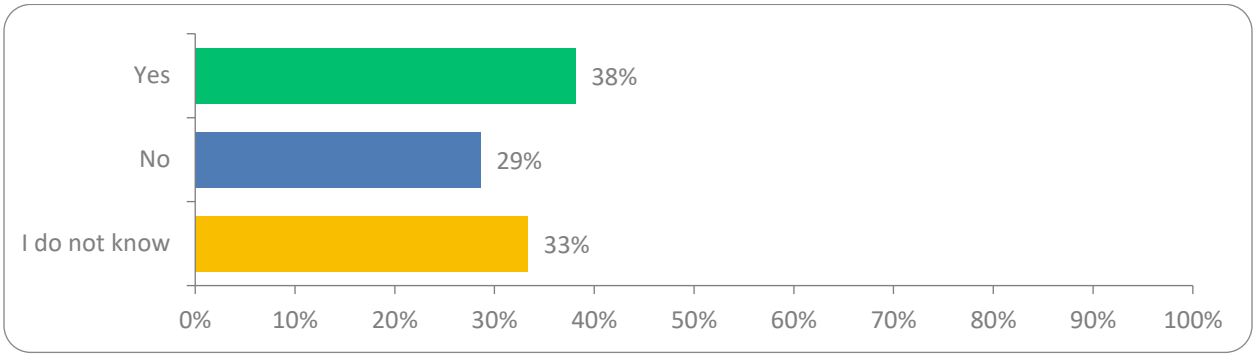

Figure 24: Do Project Managers in your organisation have solid knowledge base of Project Management

4.1.3.6 Application of Project Management processes, methodologies and procedures

Respondents were asked if Project Management processes, methodologies and procedures were applied formally in managing projects of ZAF. The majority, 57% of the respondents indicated no whereas 19% indicated that they did not know. Only 24% of the respondents indicated yes. These results signify that Project Management processes, methodologies and procedures were applied formally in managing projects of ZAF to a low extent as noted by the mean of 2.0 and SD of 0.67.

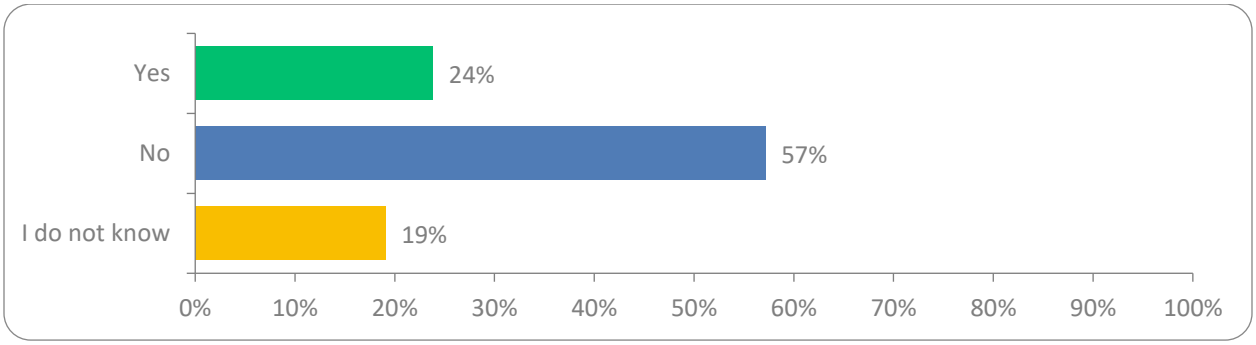

Figure 25: Are Project Management processes, methodologies and procedures applied formally in managing projects of the organisation.

4.1.3.7 Other factors

Respondents were asked based on their experience as Project Managers, to list other factors that they thought affected the application of Project Management in the Zambia Air Force. Respondents brought forth various factors which include: No project management department in the Zambia Air Force, lack of consistence funding for the project, diversions of funds meant for a particular project, posting out of personnel

involved in the project before it completion, time, cost, quality, poor communication, limited understanding of project management by some service personnel, Military doctrine and rank structure which was simplified by one respondent as the right man for the right job is not well followed as ranks take precedence over professionalism.

From the interviews, respondents were asked to name some factors that they thought could have contributed to either Project delay or failure based on their experiences. A middle management level respondent recounted:

‘’we have many mechanisms to prevent abuse and also to uphold quality in our work but sometimes these mechanisms can end up becoming red-tape and boundaries to efficient execussion of the project you find that you are just exposed to environmental factors or economic factors you going back now to request for more funding or to change your plan becomes a long process. Also, delays in funding will affect success or will may result in the failure of the project. Us being in the military we are also subject to rapidly being redeployed so this change in human resource doing the project or can I say lack of continuity sometimes affects the project adversity. Also, changes to our command change the vision or the desired outline how this infrastructure might be used or final looks”

-Respondent 1

4.1.4 Section D – ZAF Alignment to Project Management Processes and Procedures

This section focuses on processes and procedures that dictate the Project Management alignment in ZAF to processes and procedures. Respondents were asked to the best of their Project Management knowledge in ZAF to rate the processes and procedures. Values were assigned to choices that were presented to respondents. Choices were; Strongly Agree [5], Agree [4], Not sure [3], Disagree [2], Strongly Disagree [1].Values of the mean as well as the standard deviation (SD) and their implications which were applied in Section B of this study, will be applicable to this section.

Table 2: ZAF alignment to project management processes and procedures

S/N	KEY PROJECT MANAGEMENT PROCESSES AND PROCEDURES	Strongly Agree	Agree	Not Sure	Dis-Agree	Strongly Disagree	Mean	SD
01	There is availability of formal processes and practices for every Project undertaken.	0%	33%	48%	10%	10%	3.0	0.92
02	There is consistence in quantitativelyanalysing of project data collected.	0%	14%	52%	33%	0%	2.8	0.68
03	Project processes and practices are always well defined.	5%	33%	33%	29%	0%	3.1	0.91
04	There is consistence in identifying problems for every project.	5%	43%	24%	24%	5%	3.2	1.03
05	There is consistence in managing the project planning and control system.	0%	24%	38%	33%	5%	2.8	0.87
06	Processes, procedures and practices are always well integrated.	5%	19%	33%	38%	5%	2.8	0.98
07	There are efforts exhibited towards continuous improvement of Project Management processes.	0%	52%	33%	14%	0%	3.4	0.74

From table 1 above, respondents were the extent to which they agreed that there was availability of formal processes and practices for every project undertakenin ZAF. Results obtained in this study displayed in table 1 above indicate that the majority 48% of the respondents were not sure. On average, respondents indicated that to a moderate extent there was availability of formal processes and practices for every project undertaken in ZAF as depicted by the mean of 3.0 and SD of 0.96 which indicate moderate consensus.

Respondents were also asked the extent to which they agree that there was consistence in quantitativelyanalysing of project data collected and the majority indicated that they were not sure. On average, respondents affirmed that to a moderate extent there was consistence in quantitativelyanalysing of project data collected as

indicated by the mean of 2.8 whereas SD of 0.68 indicated moderate consensus on the average answer.

When asked the extent to which they agreed that project processes and practices were always well defined, there was a tie among the majorities 43% who agreed and another 43% of respondents who were not sure. On average, it was observed that to a moderate extent, project processes and practices were always well defined in ZAF as noted by the mean of 3.1 and SD of 0.91.

Respondents were asked the extent to which they agreed that there was consistence in identifying problems for every project. The majority, 43% of the respondents agreed. It was established that on average, there was consistence in identifying problems for every project to a moderate extent as depicted by the mean of 3.2. however, the SD of 1.03 indicated substantial variation from the mean showing lack of consensus among respondents on the average answer.

Respondents were further asked the extent to which they agreed that there was consistence in managing the project planning and control system in ZAF. The majority, 38% of the respondents indicated that they were not sure. On average, respondents indicated that there was consistence in managing the project planning and control system in ZAF to a moderate extent as shown by the mean of 2.8 and SD of 0.87.

Respondents were asked the extent to which they agreed that processes, procedures and practices were always well integrated. The majority, 38% of the respondents agreed. On average, respondents indicated that to a moderate extent, processes, procedures and practices were always well integrated in the ZAF as seen from the mean of 2.8 and SD of 0.98.

Respondents were also asked the extent to which they agreed that there were efforts exhibited towards continuous improvement of Project Management processes in ZAF. The majority, 52% of the respondents agreed. On average, it was found that to a moderate extent, there were efforts exhibited towards continuous improvement of Project Management processes in ZAF as depicted by the mean of 3.4 and SD of 0.74.

The interviews aimed at uncovering whether ZAF was aligned to project management processes and procedures. Contrasting views of respondents are recounted below;

"…from my professional point of view, the Zambia Air Force like most militaries is sometimes a little bit ridged so we are not keeping inline with the most techniques and also the most current ways of doing things. So in that regard we have a lot of room for growth if we can benchmark with our civilian counterparts and keep up…"

-Respondent 1

"We are on track and make sure that most of the activities especially in constructions are done according to the project management principles and also going forward I feel if we can have the standard operating procedure specifically for the projects in ZAF it would really give us a guidance, a streamlined guidance that we are able to follow and run the project smoothly."

-Respondent 3

4.2 SUMMARY

This chapter presented the findings and analysis of the information obtained from a study on the application of project management in Zambia Air Force (ZAF). The chapter covered the response rate of the study, demographic characteristics of the participants, the extent of application of project management processes, practices, tools and techniques, factors affecting the application of project management, and ZAF's alignment to project management processes and procedures. The study finds that project management in ZAF is largely characterized by male employees, and project activities are well coordinated and completed on time. The management recognizes the need and benefit of project management and provides support for project management development, but there is a need for improvement in the consistent use of project management processes and practices. The study highlights the factors affecting the application of project management in ZAF, including lack of a project management department, inadequate funding, limited understanding of project management by some personnel, and challenges with communication. The study recommends the development of standard operating procedures for projects in ZAF.

CHAPTER FIVE: DISCUSSION OF FINDINGS

5.0 INTRODUCTION

This chapter discusses the results obtained in this study. This discussion was guided by specific objectives of this study. To make an informative discussion of findings, data will be triangulated. This will be done by comparing the results presented and analysed in chapter four (4) with results from interviews as well as existing literature on the subject matter. By so doing, this discussion will be rich and informative.

5.1 EXTENT OF APPLICATION OF PROJECT MANAGEMENT PROCESSES, PRACTICES, TOOLS AND TECHNIQUES IN THE CONSTRUCTION DIRECTORATE OF ZAMBIA AIR FORCE.

A question was asked to the respondents to ascertain some of the Project Management knowledge areas that could be said to be consistent whenever a project was being undertaken in the Zambia Air Force. Majority of the respondents indicated that time, quality requirements, cost, procurement, human resource, stakeholder management, scope as well as risk management were the most consistent Project Management knowledge areas in ZAF.

This is consistent with the findings obtained through the questionnaires in this study. Respondents were asked the extent to which they agreed with ten statements that probed this objective. The overall mean was 3.7 signifying that in general, respondents had high extent affirmations to the statements.

The findings in this study are in line with the Project Management Institute (2017) which identifies ten knowledge areas which play an essential role in the successful delivery of a project. Although not all ten knowledge areas were coined by respondents in this study, significant knowledge areas were uncovered except for communication, material, equipment and integration. These knowledge areas in total ought to be; project integration management, project scope management, project time management, project cost management, project quality management, project human resource management, project communication management, project risk management, project procurement management, project stakeholder management, material and equipment.

It can therefore be said that to a high extent, the Zambia Air Force applies essential processes, practices, tools and techniques that are cardinal in the successful completion of projects.

5.2 FACTORS AFFECTING THE APPLICATION OF PROJECT MANAGEMENT IN THE CONSTRUCTION DIRECTORATE OF ZAMBIA AIR FORCE

Respondents were asked to name some factors that they thought could have contributed to either Project delay or failure based on their experiences. Majority of the respondents attributed delay or failure of projects in ZAF to; red-tape, delays in funding, rapid redeployment of human resource which breeds lack of continuity among service personnel, failure to have materials on time, failure to have the right skills, constant change in plans before start and change of costs of materials due to inflation.

These results are consistent with those obtained through the questionnaire in this study. Respondents were probed on various factors that could affect the application of Project Management in the Zambia Air Force. When asked about existence of central project management office, support for project management office, and the perceived significance of project management by top leadership, respondents were generally positive. However, when probed on factors that relate to processes, methodologies and procedures, respondents were generally negative.

From literature, Idoko (2008) identified a number of factors that are consistent with the findings in this study that were deemed as main contributors to poor project performance in developing countries. The factors included insufficient funds as well low institutional and human capacity. Jekale (2004) observed that rapid change of markets and the business environment largely affects the success of projects. Sonuga et al, (2002) bemoaned lack of institutional capacity and trained personnel as the main reasons why projects failed in developing countries.

Therefore, it can be noted that Project Management in ZAF faces a number of factors that hinder progress both at management and administration levels such as red-tape, financial and resource constraints, inconsistent human resource, constant change in plans before start, and inflation.

5.3 ZAMBIA AIR FORCE ALIGNMENT TO PROJECT MANAGEMENT PROCESSES AND PROCEDURES

The researcher wanted to appreciate the alignment of Zambia Air Force to project management processes and procedures. Therefore, respondents were asked to provide views on, how much they thought ZAF adhered to Project Management processes and procedures. The views of respondents interviewed were divided. While others mentioned that ZAF was on track in making sure that most activities were done according to project management principles, others were quick to point out that being a military organisation; ZAF does not quickly evolve to keep in line with current project management processes and procedures.

These results are in line with those obtained from the questionnaires in this study when respondents were asked to rate the extent to which they thought ZAF adhered to processes and procedures that dictates its Project Management alignment to standard processes and procedures. Various questions were asked and the average mean was 3.0 depicting that ZAF adhered to processes and procedures that dictated its Project Management alignment to standard processes and procedures to a moderate extent.

Literature reviewed in this study underscores the significance of aligning an organisation’s Project Management processes and procedures to standard ones. Project Management Institute (2013) explained that the Organizational Project Management Maturity Model (OPMMM) is designed to improve the effectiveness of organisational Project Management and assess an organisation's Maturity Level. It assures the alignment of the organisation's projects and strategies, a consistent approach to Project Management, and improved measurement and analysis of project performance.

Based on the classification of Maturity Levels for Project Management Process Maturity Model, ZAF Project Management Maturity Level was found to be at Planned Level which is a Level 2. At this Level Project Management processes are informally defined, Risks or problems are informally identified and Project Management data is informally collected.

5.4 SUMMARY

This chapter discusses the results of a study on the application of project management processes, practices, tools, and techniques in the construction directorate of Zambia Air

Force. The study found that the Zambia Air Force applies important processes, practices, tools, and techniques to a high extent. However, factors such as financial and resource constraints, inconsistent human resource, and constant change in plans hinder progress. The alignment of Zambia Air Force to project management processes and procedures was found to be moderate. The importance of aligning an organization's project management processes and procedures to standard ones is emphasized in the literature. The Project Management Maturity Levels for Zambia Air Force were found to be at Planned Level, which is Level 2.

CHAPTER SIX: CONCLUSIONS AND RECOMMENDATIONS

6.0 INTRODUCTION

This chapter consists of two main sections which conclude the entire research report. These are the research conclusion and the recommendations. The conclusion is based on the scope of the study delimited by the specific study objectives and it sets out the recommendations based on the findings.

6.1 CONCLUSION

The research concludes that the construction directorate of Zambia Air Force consistently applies Project Management knowledge areas such as time, quality requirements, cost, procurement, human resource, stakeholder management, scope, and risk management. However, the study also reveals that factors such as red-tape, funding delays, redeployment of human resource, material and skill shortages, and inflation affects the application of Project Management in ZAF. Additionally, the research sheds more light on the mixed views on the alignment of ZAF with Project Management principles. While some respondents believed that ZAF is on the right track with Project Management practices, others pointed out that being a military organization, the organisation is slow to adapt to current Project Management procedures.

In practice, this research serves as a crucial starting point for Zambia Air Force construction directorate in identifying areas of improvement and formulating more effective Project Management strategies. By consistently applying Project Management knowledge areas such as time, quality requirements, cost, procurement, human resource, stakeholder management, scope, and risk management, the organisation can achieve more successful project outcomes and maximize resources. Additionally, the research findings on factors affecting project management highlight areas where ZAF can focus on improving its processes, such as streamlining red-tape and funding processes, as well as ensuring adequate skill and material resources. Finally, the mixed views on ZAF's alignment with Project Management principles indicate room for improvement in ensuring that the organization evolves with current project management practices and trends. Overall, the study provides valuable insights for ZAF and other organizations seeking to optimize their Project Management practices.

6.2 RECOMMENDATIONS

In order to improve the efficiency, effectiveness, and sustainability of ZAF Project Management practices, the researcher has made the following recommendations:

1. When undertaking Projects, Integration, communication, material and equipment management should be considered as major Project Management knowledge areas to be applied.
2. Reduce red-tape by restructuring bureaucratic processes and if possible implement projects independently from routine works under the directorate.
3. ZAF to encourage its engineers to take up some form of training in Project Management so that Project Managers can evolve with the prevailing trends in Project Management field.
4. ZAF to consider implementing measures aimed at promoting PM to higher Project Management Maturity Levels.

6.3 RECOMMENDATIONS FOR FUTURE RESEARCH

Due to the research constraints that may either be in form of time, money or scope of research and based on the topic "Project management maturity level in the defense force of Zambia - a case of infrastructure construction in the Zambia Air Force," some potential topics for future research could include:

1. Conducting further research to generate a specific and suitable Project Management Maturity Model that ZAF can utilize in improving its current PM Maturity Level.
2. Comparison of Project Management Maturity Levels across different arms of the Zambian Defense Force to identify areas for improvement and promote best practices.
3. Analysis of the effectiveness of Project Management training and development programs in improving project management maturity levels in the Zambia Air Force.
4. Investigation of the impact of Project Management Maturity Level on project success in the Zambia Air Force, including factors such as quality, schedule, and cost performance.
5. Examination of the relationship between project management maturity and employee attitudes and engagement, such as job satisfaction, motivation, and commitment to the organization.
6. Analysis of the role of government policies and regulations in promoting Project Management Maturity and standardization across the defense industry in Zambia.

7. Examination of the impact of external factors, such as economic and political conditions, on Project Management Maturity Levels in the Zambian defense force

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SURVEY QUESTIONNAIRE

PROJECT MANAGEMENT MATURITY LEVEL IN THE DEFENCE FORCE OF ZAMBIA - A CASE OF INFRASTRUCTURE CONSTRUCTION IN THE ZAMBIA AIR FORCE

INTRODUCTION

Am a student at University of Lusaka (UNILUS)conducting a researchon EVALUATING THE PROJECT MANAGEMENT MATURITY LEVEL IN THE DEFENCE FORCE OF ZAMBIA: A CASE OF INFRASTRUCTURE CONSTRUCTION IN THE ZAMBIA AIR FORCE. Yourviews and opinions areimportant in this study. Feel free to express yourself since the research will be cardinal in the improvement of Project Management in the Zambia Air Force. I faithfully promise that no names of individuals will be used in the expression of research results and any information collected will be only for academic purpose. I thank you in advance for your co-operation.

SECTION A –DEMOGRAPHICSOF RESPONDENTS

Please tick the appropriate box

A1. Sex:

a. Male ☐ b. Female ☐

A2. Age:

a. 20 – 30 ☐ b. 31 – 40 c ☐ – 50 d. Above 5 ☐

A3. Years of experience as a Project Manager

a. Below 5 ☐ b. 6 – 10 ☐ c. 11 – 15 ☐ d. above 16 ☐

A4. Number of Project that you have spearheaded

a. Below 05 ☐ b. Projects6 to 10 ☐ c. Above 10 Projects ☐

A5. Have you ever received any Project Management related training?

a. Yes ☐ b. No ☐

A6. If yes what was the highest level of training did you receive?

A. Masters Level ☐

B. Bachelors ☐

C. Certificate or Diploma ☐

D. Short-Term Training ☐

E. As a course in a related program or field of study ☐

F. Others (pleasespecify)

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SECTION B – THE EXTENT OF APPLICATION OF PROJECT MANAGEMENT PROCESSES, PRACTICES, TOOLS AND TECHNIQUES

Tabulated below is the list of processes, practices, tools and techniques that are cardinal in the successful completion of the project. To what extent of application do you agree with the underlistedprocesses, practices, tools and techniques given the Linkert Scale as 5 - Strongly Agree, 4 – Agree, 3 - Not Sure, 2 – Disagree, 1 - Strongly Disagree.

S/N	PROJECT MANAGEMENT KNOWLEDGE AREAS	Strongly Agree	Agree	Not Sure	Dis-Agree	Strongly Disagree
01	Project activities are all well-Coordinated to ensure alignment with project objectives and goals.					
02	Project scopes are well Defined, controlled and validated.					
03	Project activities are scheduled and there is effort to ensure they are completed on time.					
04	Every project has project budget which is used for cost control.					
05	Project deliverables always meet quality standards and client expectations.					
06	The project manager is responsible for recruiting, training and general management of the project team members.					
07	There is effective communication within the project and among project stakeholders.					
08	For every project, project risks are always identified, assessed and mitigated.					
09	There is formal procurement and Management of external resources and contracts.					
10	Project stakeholders' needs and expectations are always identified and managed.					

SECTION C – FACTORS AFFECTING THE APPLICATION OF PROJECT MANAGEMENT

The questions below bring out project factors that may affect the application of Project Management in the Zambia Air Force. Based on your knowledge of practice of Project Management in ZAF, please, answer the following questions;

B1. Is the need and benefit of Project Management recognised by top leadership?

A. Yes ☐

B. No ☐

C. I do know ☐

B2. Does your organisation's management provide support for Project Management development?

A. Yes ☐
B. No ☐
C. I do know ☐

B3. Does your organisation have a central Project Management office that provides Project Management support for the Projects?

A. Yes ☐
B. No ☐
C. I do know ☐

B4. Does your organisation have standard Project Management processes and methodologies?

A. Yes ☐
B. No ☐
C. I do know ☐

B5. Do Project Managers in your organisation have solid knowledge base of Project Management?

A. Yes ☐
B. No ☐
C. I do know ☐

B6. Are Project Management processes, methodologies and procedures applied formally in managing projects of the organisation?

A. Yes ☐
B. No ☐
C. I do know ☐

SECTION C – ZAF ALIGNMENT TO PROJECT MANAGEMENT PROCESSES AND PROCEDURES

Tabulated below are processes and proceduresthat dictates the organisation's Project Management alignment to processes and procedures. To the best of your Project Management knowledge in ZAF kindly rate the processes below using the Linkert Scale as follows: 5 - Strongly Agree, 4 – Agree, 3 - Not Sure, 2 – Disagree, 1 - Strongly Disagree

How much alignment is there between ZAF Project Management processes, procedures and systems with best practices, industry standards and other relevant Project Management frameworks?

THE EXTENT OF APPLICATION OF PROJECT MANAGEMENT PROCESSES, PRACTICES, TOOLS AND TECHNIQUES

S/N	KEY PROJECT MANAGEMENT PROCESSES AND PROCEDURES	Strongly Agree	Agree	Not Sure	Dis-Agree	Strongly Disagree
01	There is availability of formal processes and practices for every Project undertaken.					
02	There is consistence in quantitativelyanalysing of projectdata collected.					
03	Project processes and practices are always well defined.					
04	There is consistence in identifyingproblems for every project.					
05	There is consistence in managing the project planning and control system.					
06	Processes, procedures and practices are always well integrated.					
07	There are efforts exhibited towards continuous improvement of Project Management processes.					

What are some of the Project Management knowledge areas that are consistently considered whenever a project is being undertaken in the Zambia Air Force.

What are some of the Project Management softwares that are employed in the execution of ZAF projects

FACTORS AFFECTING THE APPLICATION OF PROJECT MANAGEMENT

A project can fail due to a number of reasons or various factors. From your experience would you list some of the factors or reasons that could have contributed to either Project delay or failure.

ZAF ALIGNMENT TO PROJECT MANAGEMENT PROCESSES AND PROCEDURES

In your views, how much does ZAF adhere to Project Management Processes and procedures?

END