

**ASSESSMENT OF PROJECT MANAGEMENT MATURITY: A CASE OF  
ETHIOPIAN CONSTRUCTION DESIGN AND SUPERVISION WORKS  
CORPORATION**

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**A DISSERTATION SUBMITTED IN PARTIAL FULFILMENT OF THE  
REQUIREMENTS FOR THE DEGREE OF MASTER OF PROJECT  
MANAGEMENT  
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MANAGEMENT  
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**2023**

**CERTIFICATION**

The undersigned certify that he has read and hereby recommends for acceptance by the Open University of Tanzania, a dissertation entitled: *“Assessment of Project Management Maturity: A Case of Ethiopian Construction Design and Supervision Works Corporation”* in Partial Fulfilment of the Requirements for the Degree of Master of Project Management (MPM) of the Open University of Tanzania.

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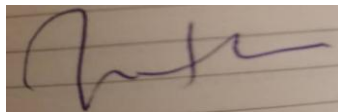
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I, **Melakeselam Dimetros Gebrehanna**, declare that, the work presented in this dissertation is original. It has never been presented to any other University or Institution. Where other people's works have been used, references have been provided. It is in this regard that I declare this work as originally mine. It is hereby presented in partial fulfillment of the requirement for the Degree of Master in Project Management (MPM).



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Signature

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Date

**DEDICATION**

This work is dedicated to my beloved family; they were and still remain a source of my dream, success and joy. They always encouraged me to achieve higher academic excellence. I thank God to have them in my existence.

**ACKNOWLEDGEMENT**

First of all I would like to thank God for everything and for helping me in doing this project work until the end. My special thanks goes to my advisor Dr. Salum Mohamed for his valuable guidance and assistance throughout this research. I would like to thank my wife for her invaluable morale support and my sisters for encouraging and paying all tuition fees and support in all aspects of this research work.

## ABSTRACT

This study was conducted with the main objective of assessing the project management maturity level of the Ethiopian Construction Design and Supervision Works Corporation (ECWDSWC) and its sectorial divisions using the ten knowledge areas as defined by PMI (PMBOK). The study adopted the project management assessment tool designed by PMI solution. The study also implemented intensive interviews and secondary data review. The result of the study has shown that the project management maturity level of the corporation is 2.2. When breaking down the result to see the individual result, we can see the corporation performs relatively superior in areas of schedule management (2.35), cost management (2.34), quality management (2.33) and resources management (2.31). On the contrary, the corporation performs the least in areas of risk management (1.88), procurement, management (2.09), communication management (2.12), and stakeholder management (2.15). The study also analyses the maturity level of the four sectors and has found the following results. The WEDSWS scores 2.36, BUDSWC scores 2.07, TDSWC scores 2.31, and GGUDSWS 2.14. The study concluded that the corporation at the earliest maturity level of 2. By and large the overall project management maturity level is not adequate given its huge responsibility in the transformation of the country's economic development. It is recommended that the corporation has to focus initially on developing the practice of the lowest ranked knowledge areas which are risk management, communication management, stakeholder management, and procurement management. The corporation has to develop strategies to improve its project management maturity; some of the actions to be addressed could be findings ways to improve its annual training programme and strengthening the capacity of the project, programme, and system management process division at the corporate, sector and center level.

**Keywords:** *Project Management, Ten knowledge areas of project management practice and Project Management Maturity*

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### **LIST OF ABBREVIATIONS AND ACRONYMS**

BUDSWS	Building and Urban Design Supervision Works Sector
CDSCo	Construction Design Share Company
CMM	Capability Maturity Model
CMMI	Capability Maturity Model Integration
ECDSWC	Ethiopian Construction Design and Supervision Works Corporation
ERP	Enterprise Resources Planning
GDP	Gross Domestic Product
GGUDSWS	Geotechnical Investigation, Geotechnical Engineering and Under Ground Design and Supervision Works Sector
HIMSS	Health Information Technology Implementation
IPMA	International Project Management Association
ISO	International Standards Organization
K-PMMM	Project Management Process Maturity Model MINCE- Maturity Increments IN Controlled Environments
MoFED	Ministry of Finance and Economic Development OGC- Office of Government Commerce
OPM3	Organizational Project Management Maturity Model
P3M3	Project, Program and Portfolio Management Maturity Model
PgM3	Program Management
PM	Project Management
PM4DEV	Project Management for Development Organizations
PMI	Project Management Institute
PMM	Project Management Maturity



PMMM	Project Management Maturity Model
PMMMSM	PM Solutions' Project Management Maturity Model
PPMO	Project & Program Management Office
QMS	Quality Management System
SEI	Systems Engineering Institute
SPSS	Statistical Package for Social Science
TCDSCo	Transport Construction Design Share Company
TDSWS	Transport Design Supervision works Sector
UPMI	Unified Project Management Information System
WEDSWs	Water and Energy Design and Supervision Works Sector
WWDSE	Water Works Design and Supervision Enterprise

## **CHAPTER ONE**

### **INTRODUCTION**

#### **1.1 Background of the Problem**

A project is defined as a sequence of unique, complex, and connected activities that have one goal or purpose and that must be completed by a specific time, within budget, and according to specifications (Wysocki, 2004). The main attributes of a project are; definite starting and ending points since it is a temporary activity; a budget; a clearly defined scope or magnitude of work to be done; and specific performance requirements that must be met. The PMI definition shows that a project is a temporary endeavor undertaken to produce a unique product, service, or result (PMI, 2017).

According to the Project Management Body of Knowledge (PMBOK), project management is the application of knowledge, skills, tools, and techniques to project activities to meet the project requirements (PMI, 2017). This application of knowledge requires the effective management of the project management processes. This includes the assessment and measurement of the existing project management process status and the continual improvement to reach higher level of project management maturity.

Many studies acknowledge that Project management nowadays becomes one of the most important driving force in implementing corporate or organizational strategic goals and vision. Increased competition and complexity of projects have also forced companies to adopt and rely upon project management to secure a competitive

advantage. As project management becomes the dominant way that work is accomplished, organizations strive to become better at delivering outputs successfully.

The predictable consequence is widespread commitment to improvement initiatives that may include the establishment of an organization project management process, the development of a career path for project managers, the implementation of project management education and training programs, and investment in project management tools and information systems.

However, the organizations cannot plan to improve their project management activities without due analysis's of their current level of project management maturity. The improvement of project management maturity has to be done purposefully. Committing an organization to a significant improvement effort requires a thorough understanding of where the organization is and perhaps more importantly, where does the organization need to grow? This is the need that is addressed by conducting a thorough assessment of project management maturity (Pennypacker & Grant 2002).

According to Kerzner (2019), the definition of project management maturity is constantly changing as the landscape for project management changes. Techniques such as agile and scrum have forced us to rethink the definitions of project management maturity. Maturity in project management is a continuously evolving process. Traditional project management maturity models must now allow for customization because each company can have a different definition of project management maturity. One size no longer fits all.

In project based organizations, project management has become the primary vehicle for achieving strategic objectives, realizing business benefits, and creating business value. Project management is treated in many firms as one of the four or five strategic competencies, necessary for the long-term survival of the firm, rather than as just another career-path position.

Therefore, it is expected that companies will look for project management maturity models to help them become better at using project management delivery systems. Project management maturity is the ongoing process of periodically identifying, measuring, implementing, and reassessing continuous improvement opportunities in the project delivery system and supporting infrastructure such that the organization can improve its ability to meet its strategic goals and objectives (Kerzner 2019).

The author also emphasizes that; the appropriate level of maturity will vary for each organization based on its specific goals, strategies, resource capabilities, scope, and needs. 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.

In this research work project management maturity of Ethiopia Construction Design and Supervision Works Corporation will be investigated using project management model developed by Project Management solution. The research will assess the project management maturity level of all ten knowledge areas as described in PMBOK6th edition.

## **1.2 Statement of the Research Problem**

In Ethiopia, although the construction industry is booming, the practice of effective project delivery in time, cost, and quality remains a challenge. The industry's effectiveness is dictated by the level of project management knowledge built in each company. The 5-year term national growth and transformation plan GTP II (2015) performance report revealed a decline of the poverty level from 26.9% in 2011 to 23.4% in 2015; however, the problem of poverty in Ethiopia remains. Large construction projects played a significant role in reducing poverty by creating a job for unemployed youths.

According to NBE (2018), the construction industry contribution covers 71.4% of the economic growth in industrial output. Unlike other economic sectors, the construction industry's influence on socioeconomic transformation is recognized through its direct, indirect, and spillover effects. Strengthening organizational project implementation performance capability of contractors and consultants in Ethiopia is needed to build the competitive construction industry.

A study conducted to assess the challenges of construction performance in Ethiopia revealed that the level of construction project management practice in terms of adapting general project management procedures, project management functions, tools & techniques to be unsatisfactory (Ayalew, Dakhli, &Lafhaj, 2016). According to the authors, the level of practice in terms of safety, risk and time management was found to be very low. The amount of schedule slippage ranges between 61-80% and that of planned costs and other variables such as risk, quality, resources utilization and

safety deviates in the range 21-40% from predetermined requirements or anticipated at the beginning of the project. In other study conducted by Sinesilassie et al., (2017), the factors that affect the success of schedule performance in Ethiopian public construction project are owner's competence, conflict among project participants, poor human resource management and project manager's ignorance and lack of knowledge.

This research conducted at the Ethiopian Construction Design & Supervision Corporation. The corporation is responsible to undertake strategic and complex mega public projects of the country and most of the projects are initiated by government offices (Zerihun 2020). The author has stressed that despite the existence of detailed planning practice on projects before implementation, most projects undertaken are facing problems of cost overrun, schedule delay and significant scope changes. These problems created substantial effect on the country's grand transformation plan because many of the projects undertaken by the corporation are strategic mega projects.

From the above argument it can be easily inferred that the project management practice of the organization needs proper assessment of its maturity status. Assessing the maturity status will be done to capture organization capacity and limitations in managing mega and strategic projects. It will also be utilized to plan the future course of action in improving the effectiveness of project management. The research will be done to assess the maturity level of all knowledge areas using the Project Management solution maturity assessment model.

### **1.3 Objectives of the Study**

#### **1.3.1 General Objective**

The general objective of this research is to assess the level of the overall project management maturity status of the Ethiopian Construction Design and Supervision Works Corporation and its major sectors.

#### **1.3.2 Specific Objectives**

The specific objectives of the study are outlined under here.

- (i) To assess the level of application of the ten knowledge areas of project management practices in the Water Works design & Supervision Sector;
- (ii) To assess the level of application of the ten knowledge areas of project management practices in the Transport Design & Supervision Sector;
- (iii) To assess the level of application of the ten knowledge areas of project management practices in the Building Design & Urban Planning Design & Supervision Sector; and
- (iv) To assess the level of application of the ten knowledge areas of project management practices in the Geological Investigation, Geotechnical Engineering and Underground Works Sector;

### **1.4 Research Questions**

#### **1.4.1 General Research Question**

What is the overall project management maturity status of the Ethiopian Construction Design and Supervision Works Corporation & its major enterprises (sectors)?

### **1.4.2 Specific Research Question**

The specific research questions of this study are,

- (i) What is the level of project management maturity of Water & Energy Works Design and Supervisor Sector (WEDSWS)?
- (ii) What is the level of project management maturity of Transport Design and Supervision Works Sector (TDSWS)?
- (iii) What is the level of project management maturity of Building & Urban Design and Supervision Works Sector (BUDSWS); and
- (iv) What is the level of project management maturity level of Geological Investigation, Geotechnical Engineering and Underground Design and Supervision Works Sector (GGUDSWS)?

### **1.5 Significance of the Study**

According to PMBOK guideline and empirical evidences, project performance increases with the better understanding of the project management knowledge areas. The level of awareness or understanding in project management knowledge areas is scaled as project management maturity level. From empirical reviews of prior researches there is strong relationship between project management maturity level and project performance hence, this study assesses and determines the maturity level of Ethiopian Construction design & Supervision Works Corporation. It significantly contributes:

To show the position of Ethiopian Construction design & Supervision Works Corporation interims of its project management maturity level and give



recommendation for further improvement in prioritizing and designing improvement action in the corporation as well as other similar companies. It also helps the corporation to baseline its maturity level and could be used to evaluate the progress to be made by the corporation as it moves through the ladder of maturity. For other researchers to be as an engine to conduct research in the area and provide information related to project management maturity issues in other project driven organizations in Ethiopia.

### **1.6 Scope of the Study**

The scope of the study is on the assessment of the project management maturity level and to establish the organization's progress in maturity level and give recommendations for future improvements. The study utilizes the model developed by Project management solution maturity model and will only focus on the assessment of project management maturity. For example the study will not assess program and portfolio level assessment due time and resources limitation. The research design of the study is limited to descriptive and the research approach uses both qualitative and quantitative research methodology.

### **1.7 Organization of the Study**

The research comprised of five chapters. Chapter one discusses the research background, research objectives, research questions, significance and scope of the research. Chapter two discusses the review of previous studies and literature. This section has reviewed conceptual definitions, theoretical and empirical literature reviews, conceptual and theoretical frame works of the research. Chapter three

discusses the research methodology that includes the research design, area of the study, population of the study, sampling design and sample design. Chapter four presents the empirical result obtained by the structured questionnaire and in-depth semi-structured interviews; the results are divided into three sections, introduction, corporate level project management maturity and sectoral level project management maturity level using the ten project management knowledge areas. Chapter five presents the summary of findings, implication of the findings, conclusions, recommendation, limitation of the study and suggestions for future studies in the field of project management maturity.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

This chapter, which is composed of a Theoretical and Empirical sub-sections, has been allocated to the review of literature pertinent to the topic at hand and developed conceptual framework for this research. It provided a summary of previous related research on the research problem and their strength and weakness and the justification of conducting this research. It briefly analyzed what is known/what have been done by others.

#### **2.2 Conceptual Definitions**

##### **2.2.1 Project**

There are various descriptions or definitions of a project. According to PMBOK a project is a temporary endeavor undertaken to create a unique product, service, or result. A project is also defined as a sequence of unique, complex, and connected activities that have one goal or purpose and that must be completed by a specific time, within budget, and according to specifications (Wysocki, 2004). A project is an endeavor in which human, financial, and material resources are organized in a novel way to undertake a unique scope of work, of given specification, within constraints of cost and time, so as to achieve beneficial change defined by quantitative and qualitative objectives. The main attributes of a project are; definite starting and ending points since it is a temporary activity; a budget; a clearly defined scope or magnitude of work to be done; and specific performance requirements that must be met.

### **2.2.2 Project Management**

Project management is the application of processes, methods, skills, knowledge and experience to achieve specific project objectives according to the project acceptance criteria within agreed parameters. It can also be described as a process of planning, scheduling and controlling of a project to meet the objectives. Project management has final deliverables that are constrained to a finite timescale and budget (PMI, 2017).

### **2.2.3 Project Management Body of Knowledge**

The Project Management Institute's: A Guide to the Project Management Body of Knowledge (PMBOK Guide) is already an accepted standard, and there is a great deal of best practices information in existence around the knowledge areas outlined in the document. Project management body of knowledge describes that the overall knowledge within the profession of project management and includes tools and techniques used to manage project management process and practices (PMI, 2017).

### **2.2.4 Ten Knowledge Areas of Project Management Practices**

Knowledge area represents a complete set of concepts, terms, and activities that make up a professional field, project management field, or area of specialization and they are used on most projects most of the time (PMI, 2017). There are ten knowledge areas according to the PMBOK guide. According to literatures, Project management body of knowledge describes the overall knowledge within the profession of project management and includes tools and techniques used to manage project management process and practices. The ten project management knowledge areas are project integration management, project scope management; project schedule management,

project cost management, project quality management; project resources management, project risk management, project communication management; project procurement management and project stakeholders' management. The project management body of knowledge (PMBOK 2017) defined each knowledge area as follows.

Project Integration Management includes the processes and activities to identify, define, combine, unify, and coordinate the various processes and project management activities within the Project Management Process Groups. In the project management context, integration includes characteristics of unification, consolidation, communication, and interrelationship.

Project Scope Management includes the processes required to ensure that the project includes all the work required, and only the work required, to complete the project successfully.

Project Schedule Management includes the processes required to manage the timely completion of the project.

Project Cost Management includes the processes involved in planning, estimating, budgeting, financing, funding, managing, and controlling costs so that the project can be completed within the approved budget.

Project Quality Management includes the processes for incorporating the organization's quality policy regarding planning, managing, and controlling project and product quality requirements in order to meet stakeholders' objectives. Project Quality Management also supports continuous process improvement activities as undertaken on behalf of the performing organization.

Project Resource Management includes the processes to identify, acquire, and manage the resources needed for the successful completion of the project.

Project Communications Management includes the processes necessary to ensure that the information needs of the project and its stakeholders are met through development of artifacts and implementation of activities designed to achieve effective information exchange.

Project Risk Management includes the processes of conducting risk management planning, identification, analysis, response planning, response implementation, and monitoring risk on a project.

Project Procurement Management includes the processes necessary to purchase or acquire products, services, or results needed from outside the project team.

Project Stakeholder Management includes the processes required to identify the people, groups, or organizations that could impact or be impacted by the project, to analyze stakeholder expectations and their impact on the project, and to develop appropriate management strategies for effectively engaging stakeholders in project decisions and execution.

### **2.2.5 Project Management Maturity**

Project management maturity has various uses and meanings. According to Andersen, & Jessen (2003) the term project maturity might be used as an indication of or a measurement of the organization's ability to use projects for different purposes. Andersen & Jessen (2003), with reference to the Webster dictionary, state that an organization can never mature in any literal sense. Similarly, Cooke-Davies &

Arzymanov (2004), with reference to the Collins dictionary, states that organizational maturity is first of all a potential of an organization rather than an actual quality of the organization.

However, a more comprehensive definition of project management maturity is given by Kerzner (2009). The author has identified various definitions of project management maturity depending up on the context of the organization internal, external environment and business needs, these are: compliance with project success criteria; completing work within the competing constraints; meeting strategic business goals and objectives; aligning project, program, and portfolio performance to strategic business objectives; effectively managing beneficial changes as part of continuous improvement efforts; maintaining or improving customer and stakeholder satisfaction; improving efficiency and effectiveness in execution; improving the organization's governance structure and improving how the firm competes in the marketplace.

### **2.3 Theoretical Literature Review**

Today organizations must manage not only isolated projects, but also internal and external portfolio project where the relationship between the project and the organization takes much importance. Projects are not oriented towards the solution of isolated technical problems anymore; they now extend their reach into the management of the company and change. The projects are understood as a base to carry out the strategic management and competitive advantage; these have become one of the best ways to align the organization's resources that are always scarce and solving large corporate strategic issues (Kerzner 2009).

### **2.3.1 Benefits of PMM Assessment (Development of PM Models)**

Project Management is becoming increasingly recognized as the subject develops and more organizations began to reap the benefits. The popularity of project management is growing in an increasing rate during the last decade generally on every field like engineering and construction, manufacturing industries, computer software development, etc. The technologies that affect the processes of organizations are continuously changing (Beset, 2007).

On the other hand Andersen & Jessen (2003) have argued that the field of project management has extended its focus from study of a single project to the way a company or organization is using projects to achieve its strategic goals. The authors pointed out that specific feature of project based organizations is composed of the management of single projects, the management of network of internal and external projects, and the relationships between the company and the single project. Today projects are seen as far more than solving of technical problems; they are also venues for mastering business and change. In order to achieve these benefits organizations must continually assess and develop their project management practices (Beset, 2007).

The author emphasizes that development and continuous improvement can only be achieved by measurement of performance and goal setting. On the same basis, organizations are searching for the best practices for management of projects, evolving the discipline to treat not only the management of a project, but to find a way how projects allow reaching the goals of organizations (Andersen & Jessen 2003).

When organization realizes the need for self-improvement on its activities, it will also need to know potential development areas. Project Management Maturity is one of the



effective methods to assess this, (Arda, 2007). The term project maturity might be used as an indication of or a measurement of the organization's ability to use projects for different purposes (Andersen, Arne, 2003).

What is common in most of the above definitions is the idea of consistent and repeated practice, measurement and improvement or advancement. According to (Paulk et al, 1993) as an organization matures, the predictability, effectiveness, and control of an organization's processes are expected to improve. Maturity in project management is a never-ending journey, with a never-ending cycle of benchmarking and continuous improvement (Kerzner, 2001). "As an organization gains in project management process maturity, it institutionalizes its project management process via policies, standards, and organizational structures. Institutionalization (demands) building infrastructure and a corporate culture that supports the methods, practices, and procedures of the organization so that they endure after those who originally defined them have gone" (Paulk et al., 1993). The more mature an organization's practices are, the more likely the organization meets its project goals successfully," (PM Solutions, 2008).

According to (Chrissis, Konrad, & Shrum, 2003), a matured process is well understood throughout a mature organization; usually through documentation and training, and the process is continually being monitored and improved by its users. The capability of a mature process is known. Process maturity implies that the productivity and quality resulting from an organization's use of the process can be improved over time through consistent gains in the discipline achieved by using its

process. A mature organization has an organization-wide ability for managing initiatives based on standardized and defined management processes.

In such organizations, activities are carried out according to defined processes and plans. Roles and responsibilities are well defined and understood. Such organizations have also an objective way of measuring performance and quality. “In general, in a matured organization, a disciplined process is consistently followed because all of the participants understand the value of doing so, and the necessary infrastructure exists to support the process” (Sarshar, et al., 2000). An immature organization on the other hand is an organization that does not have or use consistent and defined processes in management of its projects (Sarshar, et al., 2000). An organization that is immature in project management may occasionally deliver individual (projects) that produce excellent results.

However, in such cases managers are more likely to be working reactively, focusing on solving immediate issues, rather than proactively acting. In addition, schedules and budgets are likely to be exceeded and if deadlines are imposed, the quality of deliverables is likely to be compromised in order to meet the schedule. In an immature organization, repeatable processes and results depend entirely on the availability of specific individuals with a proven track record,” (Office of Government Commerce, 2006).

### **2.3.2 Types of Maturity Models**

According to PM Solutions (2012), project management maturity refers to: ... progressive development of an enterprise-wide project management approach,

methodology, strategy, and decision making process. Maturity models for project management are developed to assist organizations that have the desire to understand and improve their project management practices. By comparing their own practices against best practices described by these models, organizations can find out how mature or professionalized they are in performing project management and what they could do to realize desirable improvements in it.

However, with more than 40 maturity models available in the field of project management, organizations have to consider carefully which one they can adopt. In order to do this, organizations need to know what aspects of these models are important to consider and how they should evaluate them (T, J 2017). In last twenty years, it is observed the release a large number of maturity models, however is possible to identify some that are the more applied, among which are mentioned the Capability Maturity Model (CMM), the Organizational Project Management Maturity Model (OPM3), and the Program, and Project Management Maturity Model (P3M3). These models have similar structures in terms of the factors that analyze, which usually include their own proposals for management of projects, and in addition a scale of measurement of different levels.

One of the first models of maturity appeared when, in 1991, the Software Engineering Institute (SEI) at Carnegie-Mellon University designed, in 2001, a model of maturity of capabilities, the CMM, to measure the processes in software development organizations (Mutafelija& Stromberg 2003). The model proposes a structure of five levels of maturity for analyzing some areas of key processes, common characteristics and key practices (López et. al.2017).

Another model is the OPM3, proposed by the Project Management Institute (PMI), Professional Association of management of projects that started at the end of the 1960's in the United States that currently brings together professionals from around the world (Project Management Institute-PMI 2013). This model is structured around a structure of four levels of maturity, good practices, capabilities to carry them out, the observable results, and the stages of the process of improvement (Project Management Institute-PMI 2013), (Project Management Institute-PMI 2008).

The P3M3 model, proposed by the Office of Government Commerce (OGC) in the United Kingdom, was based in its origins in the CMMI, but has been particularly modified to assess the maturity levels of the organization project, program and portfolio relationship. This model is structured around five levels of maturity, a few areas of development and a group of processes (Office of Government Commerce 2006), (Office of Government Commerce 2013a), (Office of Government Commerce 2013b).

Another important model is developed by Kerzner and referred as Kerzner Project Management Maturity Model (K-PMMM). This model is based on knowledge areas of PMBOK. K-PMMM assesses Project Management Maturity of organization using PMBOK guide and provide five levels of maturity. This model consist five basic levels to enable better understanding of its functionality and proficiency for project management. These levels are commonly known as level of common language, common process, singular methodology, benchmarking, and continuous improvement (Kerzner 2019).

First published in book form in 2002 and released in its second edition in 2007, the PMMM provides a logical path for progressive development and a strategic plan for advancing project management improvement within the organization. The model that PM Solutions developed utilizes the PMBOK® Guide's ten knowledge areas and is patterned after the Capability Maturity Models of the Software Engineering Institute. The model has five distinct levels of maturity and examines an organization's implementation across the ten project management knowledge areas (Crawford 2015).

The PM Solutions Project Management Maturity Model is based on a two dimensional framework. Both of the dimensions are based on accepted industry standards. The first dimension reflects the level of maturity. It is based on the structure of the Software Engineering Institute Capability Maturity Model. This model has received widespread acceptance as a standard for process modeling and assessment of organizational maturity in several process areas (Crawford 2006). The second dimension depicts the key areas of project management addressed. This dimension adopts the structure of PMI's nine knowledge areas (Project Management Institute 1996). Each of the ten knowledge areas were further decomposed into key components that provide for a more rigorous and specific determination of project management maturity. There were a total of forty-nine specific components included in this study.

### **2.3.3 Levels of Maturity**

There are five levels of maturity included in the PM Solutions Project Management Maturity Model.

**Level 1: Initial Process**

“Although there is recognition that there are project management processes, there are not established practices or standards, and individual project managers are not held to specific accountability by any process standards. Documentation is loose and ad hoc. Management understands the definition of a project that there are accepted processes, and is aware of the need for project management. Metrics are informally collected on an ad hoc basis” (Pennypacker 2001).

**Level 2: Structured Process and Standards**

“Many project management processes exist in the organization, but they are not considered an organizational standard. Documentation exists on these basic processes. Management supports the implementation of project management, but there is neither consistent understanding, involvement, nor organizational mandate to comply for all projects. Functional management is involved in the project management of larger, more visible projects, and these are typically executed in a systematic fashion. There are basic metrics to track project cost, schedule, and technical performance, although data may be collected/correlated manually. Information available for managing the project is often a mix between summary level data, and detailed level data” (Pennypacker 2001).

**Level 3: Organizational Standards and Institutionalized Process**

“All project management processes are in place and established as organizational standards. These processes involve the clients as active and integral members of the project team. Nearly all projects use this process with minimal exception management has institutionalized the processes and standards with formal documentation existing

on all processes and standards. Management is regularly involved in input and approval of key decisions and documents and in key project issues. The project management processes are typically automated. Each project is evaluated and managed in light of other projects (Grant & Pennypacker 2006).

#### **Level 4: Managed Process**

“Projects are managed with consideration to how the project performed in the past and what is expected for the future. Management uses efficiency and effectiveness metrics to make decisions regarding the project and understands the impacts on other projects. All projects, changes, and issues are evaluated based upon metrics from cost estimates, baseline estimates, and earned value. Project information is integrated with other corporate systems to optimized business decisions. Processes and standards are documented and in place to support the practice of using such metrics to make project decisions. Management clearly understands its role in the project management process and executes it well, managing at the right level, and clearly differentiating management styles and project management requirements for different sizes/complexities of projects. Project management processes and standards are integrated with other corporate processes and systems” (Pennypacker 2001).

#### **Level 5: Optimizing Process**

“Processes are in place and actively used to improve project management activities. Lessons learned are regularly examined and used to improve project management processes, standards, and documentation. Management and the organization are not only focused on effectively managing projects but also on continuous improvement. The metrics collected during execution are used to understand the performance of not

only a project but also for making organizational management decisions for the future” (Grant & Pennypacker 2006).

## **2.4 Empirical Literature Review**

In this section of the study, different reviewed literature relevant to the study will be discussed. The literature reviewed shows that there have been numerous researches done to assess various organizations' project management practice in globally. However, given the size of the Ethiopia and its construction industry there is limitation of finding such researches and most of the available ones are limited to Msc dissertations. The study reviewed articles and thesis's conducted under the area of assessing level of project management maturity of different countries at different years in order to give feedbacks on the study area.

### **2.4.1 Empirical Literature Review Worldwide**

This literature review: provide a summary of previous related research on the research problem and their strength and weakness and the justification of conducting this research. It briefly analyzes what is known/what have been done by others. I also provides why this research is necessary.

Mustaqeem et al., (2020) conducted a study titled Project management maturity in Pakistan: An empirical investigation. The study had concluded that project management practices in an organization can predict a project's performance or success. Subsequently, these can also define its project management maturity (PMM) level. This study aimed at defining the overall PMM level of Pakistani industries (sample size was 12), which was found to be 2.32 on the scale of 1 to 5. Three



standard PMM models were used to gauge this level. It was further concluded that 3 out of 4 projects fail to deliver the iron triangle. On further investigation, it was found that on average, 10.3% of the projects were successful in organizations at a Project management maturity level of 1, which is 43.3% for organizations at level 4 and 60% for organizations at level 5. The study indicated that the higher the PMM level, the higher the project success. At sectorial level, public sector organizations had project success rate of 22.8% as compared to 24.8% of the private sector.

Spalek, (2014) had conducted a research on, 'Assessing project management maturity in the area of knowledge management in selected companies', the study is done using the PMM model, which measured maturity in four areas: methods and tools, human resources, project environment and knowledge management. Moreover, the main aim of the study was to compare Polish and foreign companies via an examination of diverse industries. The results of the study revealed that, in general, the foreign companies are at a higher PMM level in the knowledge management area than their Polish counterparts. The results from this article show that, irrespective of the country of origin of the company, the lowest maturity levels in the knowledge management area were noticed in the machinery industry (1.59), then, the maturity level increases slightly in construction (2.35) firms. Effectively managing knowledge in projects is the key factor in the company gaining a decisive advantage. This is of special importance in those organizations running a significant number of projects on a yearly basis. Nearly 99% of construction companies reported the initial (1st) or standardized (2nd) level of maturity, while all foreign ones were at the standardized (2nd) or managed (3rd) level.

Gorecki (2015) had conducted a study on 'Problems Associated with Project Management in Polish and foreign construction companies'. This paper describes the problem of project maturity for construction companies when analyzed by their ability to execute construction investment projects. According to the results of surveys presented in the article, it was revealed that both Polish and foreign companies appreciate the value of project management. They see the importance of continuous improvement of project management capabilities. A need for improving the performance and perfecting the risk management can be a reason for creating a five-step model of continuous improvement of project maturity. On the basis of survey results it was revealed that the success of a company is connected with the increasing level of project maturity as a condition for a successful project management.

The longitudinal analysis of project management maturity conducted by Mullaly (2006) covered 550 international organizations over a period of 6 years. He used an unpublished maturity model that uses five maturity levels and 12 capability areas. The 12 capability areas are decomposed into a number of capabilities and these are in turn broken down into identified practices. Data was collected using a multiple choice survey with some limited verification using interviews and reviews of practice. Over the 6 year period of the survey, the number of organizations at level 1 increased (from 30% to 72%), that of organizations at level 2 and at level 3 decreased (from 64% to 28% and from 6% to 0% respectively). No organizations were assessed to be at levels 4 or 5 in the study. The main reason for this decline in maturity offered by Mullaly (2006) was that the organizations participating in the study varied from year to year. Based on this research organizations in the engineering industry exhibited higher maturity levels.

Mullaly & Janice. (2010) made a study to assess project management maturity level in Indonesian businesses may bring insight about current business practices, which is important to speed up country development and business sustainability. Adapting the Project Management Maturity Model (ProMMM), a survey instrument has been developed and applied to professionals from Jakarta and surrounding area. The result of analysis shows that construction and primary industry have a higher maturity level compare to manufacturing and services. The research has also identified that the level of project management understanding is low across industries. The study also identified that there is a relationship between maturity and performance, but that no statistically significant correlations exist to prove it.

Young and Ibbs, (2011) had conducted a study titled ‘Assessing project management maturity’. The study summarizes the results of research conducted by investigators in assessment of project management maturity. The principal goal of this study was to determine the financial and organizational impacts of Project Management (PM). The PM Maturity assessment for all companies averaged 3.26 on a relative scale of 1 (lowest) to 5 (highest). Overall the Engineering-Construction (EC) industry had the highest score, and the Information Systems (IS) application area had the lowest. PM Maturity assessment methodology provides solid and comparative studies on PM practices across industries and companies within an industry. This study is one of the few, if not the first attempt to truly integrate PM Knowledge Areas and PM Phases against actual project performance data. The result is that this study methodology provides a set of tools for organizations to use in identifying key areas of opportunity for improvement in project management.

Grant and Pennypacker (2006) performed a benchmarking study of 126 organizations across 17 different industries. They conducted a web based survey and their approach used 9 PMI knowledge areas and studied 42 components of maturity by devising 5 levels of maturity. They concluded that the surveyed organizations had a median level of project management maturity at level 2. They also found that project management maturity had no significant difference across the industries they studied. Davies & Arzymanow, (2003) conducted a benchmarking study that explored variations in project management practice in 21 organizations across six industries. The empirical research was based on in depth interviews conducted with “knowledgeable project management practitioners” according to the researchers. A score was given to each organization for each domain and the overall maturity level can be calculated from these scores. These individual domain results are important as they will direct where effort is needed to improve practice. The authors also concluded that more established users of project management such as the engineering-based industries demonstrate a higher level of maturity.

#### **2.4.2 Empirical Literature Review in Africa**

In Kenya, the studies on project management maturity are infrequent. This could be attributed to the fact that “Project Management has not been effectively embraced locally. The profession is still not widely accepted as a key stakeholder by public and private enterprises who have little knowledge of what Project Management really represents” (PMI Kenya Chapter, 2017). Albeit a case study on South Nyanza Sugar company “revealed that the use of standard benchmark practices for project management was generally low in Sony Sugar; the practices were informal in most

cases” (Otieno, 2012). Further, research carried out on building contractors in the Westland’s area of Nairobi concluded that “the construction PM process maturity and practices maturity of the contractors (Grade-1 contractors in Kenya) are found to be at low level... Not a single contractor has managed to achieve an intermediate standard of PM practice maturity level,” (Ouko, 2016). The study made by Amunga, (2020) sought to establish the relationship between project management maturity and project implementation in the large peer group financial institutions in Kenya. Project Management Maturity elements were; organizational structure, project processes, people management and systems and tools. The study confirmed a significant relationship between project management maturity and project implementation in the large peer group financial institutions in Kenya.

Similarly, a research done in Egypt had shown that the maturity level of Egyptian organizations working in the construction industry attained a project management maturity level of almost 1 on a scale of 1 to 5 (Moutawei et al. 2017). This implied that, Egyptian Contracting organizations are still at the basic level and a lot of efforts are necessary to reach a higher level. The study revealed that, Egyptian contractors are characterized by; a lack of formal project management methodologies/ standards; a lack of awareness and implementation of project management maturity models and absence of best practices in the field of project management.

Pretorius et al., (2012) had conducted a study on Project management maturity & project management success in the engineering & construction industries of South Africa to see whether project management maturity and project success are correlated. The study failed to establish any correlation between the project management maturity

of an organization and the perceived outcome of the projects that it produces. The authors claim that higher project management maturity does not automatically lead to project success; projects can be successful despite the maturity level of the organization. This finding could be an indication that project success is influenced by factors other than standardized practices implemented by the project office. The factors that could influence project success might include: organizational culture; the competence level of the least competent project team member; the size of the project, and the competence of the project manager.

In Ghana, a study was carried by Ofori & Deffor (2013) to; “examine the level of understanding of the concept of PM maturity; perform a detailed component level comparison of project management maturity between selected industries in Ghana”. The key findings were; NGO's had comparatively higher maturity levels and public-sector organizations had low levels of maturity. The study further concluded that these low maturity levels could be a contributory factor to the many instances of public sector project failures.

### **2.4.3 Empirical Literature Review in Ethiopia**

A research by Abebe (2017) titled “Project Management Maturity in Ethiopian Construction Works Corporation: The Case of Road Construction Projects” had assessed the PM maturity of the corporation. The study revealed that, the construction PM process maturity and practice maturity of the organization is found to be at a low level. Among the knowledge areas cost and time management are with better maturity level of 3.08 and 2.96 respectively. Quality and Risk management are the least matured areas with level 2.5 and 2.28 respectively. This show, on average, the

organization PM process and practice maturity is at the basic level. Such low maturity score depicts the case that the organization performs the project management practices without following structured approach or guide line, relying solely on the knowledge and experience of the project manager or project team, and on average the contractors are performing only the basic practices under each knowledge area.

Lafhaj et al. (2016) conducted a study titled "Assessment on Performance and Challenges of Ethiopian Construction Industry" to study & understand the construction industry's level of project management practice. The research involved 69 professionals from important stakeholders of the construction industry. The research concluded that the level of construction project management practices in terms of adopting general project management procedures, functions, tools & techniques to be unsatisfactory. Moreover, the study found that the level of practice of variables, such as cost, safety, risk, and time management, is to be deficient compared to their predetermined or planned values. The amount of schedule slippage ranges between 61-80% and that of planed costs and other variables such as risk, quality, resources utilization and safety deviates in the range of 21-40% from predetermined requirements, planned or anticipated at the beginning.

Another research was done by Zewdie (2016) to identify which processes of project management are effective for attaining the success of a project by studying cases of successful and failed projects in Ethiopia. The study output has shown that the triple constraints like cost, quality, and time, and the communication processes of the subject groups are the most effective project management processes towards the project's success. Moreover, planning processes from the process groups are useful for

achieving the success of projects. The study also concluded that significant numbers of projects in Ethiopia are under the failed category. So, the author recommends project management processes like planning, time, quality, cost, and communication processes have to be given considerable attention during implementation of the project.

A study made by Sinesillasie et al., (2017) titled "Critical factors affecting schedule performance: a case of Ethiopian public construction projects engineers' perspective", to determine the factors responsible for impacting performance of Ethiopian public construction projects. According to this research; owners' 'competence, can significantly contribute to schedule performance of Ethiopian public construction projects. On the other hand, 'conflict among project participants', 'poor human resource management' and 'project manager's ignorance and lack of knowledge' are detrimental to schedule performance of Ethiopian public construction project.

Yimam (2011) also conducted a study on the Ethiopian construction industry titled Project management maturity in the construction industry of developing countries: The case of Ethiopian contractors. The study aimed to assess whether and to what extent the processes; practices & tools under each project management knowledge area are being applied by the Ethiopian contractors in managing their construction projects. The study surveyed a total of 40 contractors of which 32 of them were local and 8 of them were international contractors. The research also showed that much of the knowledge areas of the PMBOK guide are implemented informally. In addition the research revealed that the construction PM process maturity and practices maturity of the contractors found to be at low level at average maturity of 1.30 in a scale of 1 to



5. It also concluded that contractors that had ISO certifications or are on the way of certification showed higher levels of maturity.

Another study was conducted by Karlsson, (2011) on the project management practice in Sweden & Ethiopia and potential improvements in project management methods. The research was performed on one of the most prominent private organizations in Ethiopia, MIDROC, and its subsidiary in Sweden. It aimed to identify successful project management methods and share between the two organizations to increase efficiency and minimize the risk of construction projects. The study concluded that there are several areas of improvement in MIDROC Ethiopia and only a few in the Sweden counterpart. In the Ethiopian company, the planning process is not prioritized, and many of the projects start execution without sufficient planning. Also, project control is not prioritized, and rather than controlling; problems are solved as they occur. Moreover, issues also arise in project management systems, integration management, human resource, cost, time, and procurement management.

Lastly, previous literature on ECDSWC was reviewed to show the literature gap that must be filled. (Rahel, 2017) worked on the assessment of the quality management practice of ECDSWC. The study used questionnaire as an instrument for collecting data. The study concluded that although the organization has adopted ISO 9001:2008 quality management system, there are problems in the implementation of the system. The study also showed that top management is more committed to the project quality planning process than quality assurance and quality control. Moreover, employee's participation in quality programs & awareness on their contribution to project quality is low.

Another research was conducted by (Mahlet, 2019) on the stakeholder management practice and challenges in ECDSWC to identify key stakeholders, defining the role of the stakeholders, and examining the difficulties encountered. The research concluded that the organization focuses more on managing internal stakeholders that have contractual relationships than external. Also, the survey discovered that there is very little adaptation of stakeholder management practices in the construction sector. Both studies done in ECDSWC showed that there are some gaps in quality management and stakeholder management practice within the corporation.

## **2.5 Research Gap**

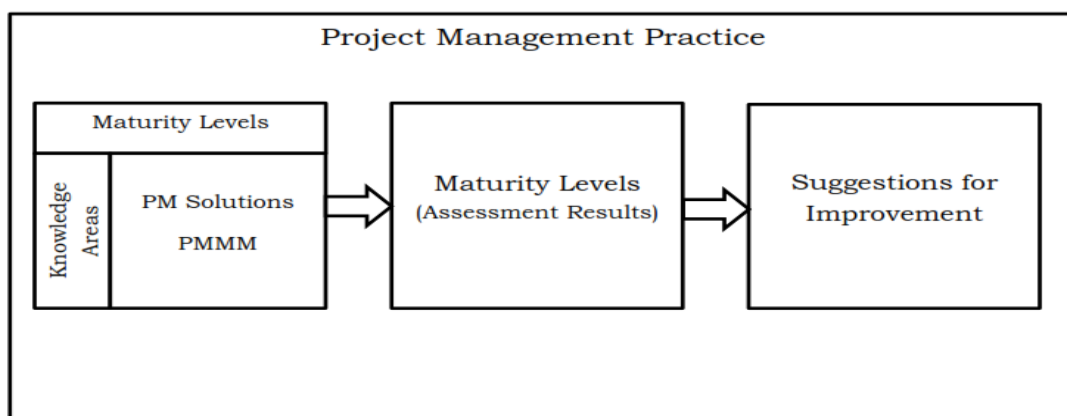
The results of the theoretical and empirical literature review had clearly shown that there are very few studies conducted in maturity level assessment of the major stakeholders of the Ethiopia public construction industry. Abebe (2017), Lafhaj et al., (2016), Ejigu (2017), Mulugeta (2020), Yimam (2011), have done PM maturity in their Msc thesis. However, except the studies made by Yimam (2011), and Lafhaj et al (2016), the other scopes of research were limited and utilize very small sample sizes. For example Mulugeta (2020) used only four project manager as her sample size in her study of PM maturity of Bamacon Construction Company. On the other hand Ejigu (2017) on his studies of the PMO maturity level of commercial bank of Ethiopia has used only twelve project managers which may not represent the overall maturity level of the Commercial Bank of Ethiopia that has one thousand seven hundred branches and an annual turnover of over four hundred million dollar.

Given the size of the country and the huge demand in public construction works requirement, what has been done cannot contribute much to the development and

improvement of the project management practices via PM maturity. Conducting project management maturity level assessment at both corporate level and individual sectors level will enable the organization to identify gaps at its head quarter as well as at the sectors level. The study will also furnish valuable data to be used for benchmarking and further studies for improvement of the overall PM maturity of the corporation and its sectors.

## 2.6 Conceptual Framework

A conceptual framework is a written or visual representation of an expected relationship between variables. Variables are simply the characteristics or properties that you want to study. A conceptual framework is an analytical tool with many variations and contexts. It is used to make conceptual distinctions and organize ideas by using diagrams or charts and the like. Hence, the researcher tries to see the relationship between Project management, the researcher uses a five-level maturity model adopted from Project Management Solutions which encompass ten project management bodies of knowledge areas listed under PMBOK.



**Figure 2.1: Conceptual Framework of the Study**

Source: Adopted from Reviewed Literature (Ejigu, 2017)

## **2.7 Theoretical Framework**

The study assesses the project management practice of ECDSWC by using the ten knowledge areas defined by the PMI (PMBOK 6). The study assesses the project management maturity level of Ethiopia Construction Design & Supervision Works Corporation and its four enterprises (sectors) based on the independent variables, which are the ten project management knowledge areas. The ten project management knowledge areas are project integration, scope, schedule, cost, quality, stakeholder, resource, procurement, and communication and risk management.

For the purpose of the research, five maturity levels based on PM solution maturity model is used to assess the PM maturity level of the corporation. The Project Management Body of Knowledge (PMBOK Guide) being an excellent point of reference to measure project management capability, the researcher use a five-level maturity model. It has characteristic of being multi-dimensional in full context. It provides framework to measure project management maturity levels as defined on a 1-to-5 point Likert scale, with 1 being the lowest level of project management maturity and 5 being the highest level. The scores for each deliverable are averaged to determine one score for each project management knowledge areas. The scores are then combined and analyzed to calculate an overall project management maturity level of the corporation and each sectors. Each process in the ten knowledge areas are ranked from level one to five and aggregated into the rank of knowledge areas, accordingly, the project management maturity level of each sectors and the corporation is analyzed.

## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.1 Introduction**

The research was exploratory in nature and utilized a survey methodology approach for data collection. For the purposes of the study, a survey instrument is developed to provide measures of project management maturity in Ethiopia Construction Design and Supervision Corporation. Quantitative and qualitative methods are integrated to conduct the survey and develop comprehensive information base.

The research approach is a general orientation to conduct business research (Benbasat, 1987). There are two distinct research approach or strategies, i.e. Quantitative and qualitative. Thus, quantitative research can be taken as a research strategy that emphasizes quantification in the collection and analysis of data. The quantitative approach emphasized the collection of numerical data; it drew influences from those data and resolve problems using numbers.

On the other hand, qualitative research can be taken as a research strategy that usually emphasizes words rather than quantification in the collection and analysis of data (Saunders et al., 2009). The foregoing two-research technique concepts illustrate the rationale behind this study's decision to follow both qualitative and quantitative method. The following strategies and approaches is followed to develop a very good data base, review of literature and other documents; conducted structured quantitative survey; and conducted semi structured interviews.

### **3.2 Research Design**

The research design used is a descriptive type in nature, which describes the particular project management practices within Ethiopian Construction Design and Supervision Works Corporation. The descriptive research portrays the characteristics of the project management practice within the organization accurately; since, descriptive studies are concerned with describing the characteristics of a particular individual, situation or group. The primary purpose is a description of the state of affairs as it exists at present, and they include surveys and fact-findings of different kinds. Descriptive studies are concerned with specific predictions, with the narration of facts and characteristics concerning the situation (Kothari, 2004). The research design used is survey methodology. The research issues considered in this study are investigated through literature review, questionnaires and interview with the selected respondents.

The survey questionnaire captures a data through the assessment of respondent's perceptions. The data gathered are quantitatively analyzed and the study's findings interpreted and generalized. A collection of potential literatures related to project management maturity are identified through review of related to literatures and documents. The respondents expressed their opinions concerning the project maturity levels of the corporation and sectors according to the model selected for the study.

### **3.3 Area of the Study**

The Ethiopian Construction Design and Supervision Work Corporation is a public corporation established as a Federal Government Public Enterprise by Council of Ministers Regulation No. 365/2015 and the Ethiopian Construction Design and Supervision Works Corporation, is a multi- disciplined engineering firm provides

professional services in water and energy, transport, building and urban planning and related disciplines. The Corporation was founded by amalgamation of three former Public Enterprises, viz. Water Works Design and Supervision Enterprise, Building Construction Design Share Company and Transport Construction Design Share Company those were predominantly providing engineering consultancy services in water, transport and building sectors, respectively. The Corporation has organized its organizational structure with six business units that comprise four sectors and two centers having a total of human capital of 1800 employees (source corporate Resources Management Office).

The proposed research area for the study is concentrated mainly in the head office of the corporation and sector offices in Addis Ababa. However, some sample are collected in the project offices outside the capital when they come to Addis during holiday break.

### **3.4 Population of the Study**

Population refers to the total or aggregate of all individuals with specified characteristics (Richard, 2006). The collection of all possible observations of a specified characteristic of interest is called a population while a collection of observations representing only a portion of the population is called a sample. The population of the research comprises employees of Ethiopian construction design and supervision Works Corporation who are directly involved in projects. The research targets those employees are responsible for planning, executing, and controlling and supporting overall project implementation within the organization. The target population is comprised of process owners, sub process owners, team leaders, project

managers, project coordinators, project members, experts and executive members as well as senior staffs from the functional department such as finance, procurement and human resources. The size of the population is five hundred sixty five (565) staff members working in the corporate head office, and four sectors and the two centers, (Source corporate resources management office).

### **3.5 Sampling Design and Sample Size**

#### **3.5.1 Sampling Design**

Sampling is the process of selecting units or individuals from a population, which can be included in the study, to answer survey questionnaires and interviews. The study used purposive sampling where experts from each process (department) groups, are selected randomly and proportionally. A sample proportionally selected from each sector based on the distribution and the number of eligible participants is 28.66% of the total population.

#### **3.5.2 Sample Size**

There are two main options: probability or representative sampling and non-probability or judgmental sampling (Saunders, 2009). Non-probability sampling implies that probability of each case being selected is unknown, and that the researcher subjective judgment is used in purpose of selecting the sample. This means that there is no possible way of statistically generalizing the findings when using this type of sample, but that it is not to say that generalization in its own is not possible. Miles and Huberman, (1994) state that qualitative samples need to be purposive instead of random and promote non-probability sampling approach in qualitative research. These studies adopt stratified purposeful random sampling and judgment



(purposive) sampling. From the source population of this research the appropriate sample for questionnaire administration were determined by Yamane's (1967) formula of sampling technique. Accordingly, sample size has been determined at 94.5% confidence level and with is 5 % standard error (e). The sample size is determined using the formula below.

$$n = N / ((1 + N(e^2)))$$

Where:

e = Marginal standard error, 7.5%

N = Target population of the sample (565)

n = Sample size, by substituting the given parameters in the formula

$$n = 565 / ((1 + 565(0.075^2)))$$

$$n = 565 / ((1 + 1.709))$$

$$n = 168.9, \text{ Take } n=168$$

According to this formula 168 samples are selected in a stratified form from the total population of 565. This is equivalent to 28.66 % of the target population.

### **3.6 Methods of Data Collection**

#### **3.6.1 Secondary Data**

Document analysis is used to support the analysis by reviewing different documents of Ethiopian Construction Design and Supervision Work Corporation Head Office. Some of the documents that are analyzed include the Corporation's strategy plan, project management plans, guidelines, procedures that affect the project management practice of the corporation.

### 3.6.2 Primary Data

The primary data collected are the project management maturity level of the ten project management knowledge areas and the forty nine processes as depicted in the PMBOK 6. The primary data are collected using semi structured interview and structured questionnaire.

## 3.7 Data Collection Tools

### 3.7.1 Structured Questionnaire

As stated by Kothari (2004), questionnaire is one of the most popular data collection methods. Primary data is collected by using questionnaires techniques. The questionnaire is used is adopted from PM solution assessment model and is in line with the ten knowledge areas as described in the PMBOK (2017). The questionnaire are printed, then distributed to the respective respondents in a workshop where briefing is given regarding the proposed survey maturity model. After the briefing is completed each respondent filled the questionnaire and returns. These data are checked, encoded to statistical software and analyzed.

**Table 3.1: Number of Questionnaires Distributed and Response Rate**

S/N	Sectors of The Corporation	Sample Size	Response Rate	%
1	Corporation's head office	4	2	50%
2	Water and Energy Design and Supervision Sector	44	32	72.73%
3	Transport Design and Supervision Works Sector	24	26	92.31%
4	Building & Urban Design and Supervision Works Sector	39	36	92.31%
5	Geotechnical Investigation, Geotechnical Engineering Sector & Underground Works Sector	24	24	100%
6	Surveying Engineering, Geospatial and Civil Informatics Center	12	10	83.33%
7	Research & Laboratory center	17	12	70.59%
<b>Total Population</b>		<b>165</b>	<b>142</b>	<b>86.59%</b>

Source: Own Survey Result, (2022)

As can be seen from the above table about 86.5% of the respondents has fully completed the questionnaires and returned the same for data analysis and reporting. The lowest response rate is from the corporate head office (50%) and the highest response rate is from the geotechnical investigation, geotechnical engineering sector.

### 3.7.2 Semi Structured Interview

Semi-structured interview with twenty process executive officers at both corporate and sector level within the organization is done to cross check what was collected through structured interview. Interviews, as described by (Svenning, 2003), are a useful tool to collect soft data and a semi-structured interview can, in general, be problem-oriented or problem-based. The objective of this method is to interview a few people around a given specific subject. This tool is characterized by the fact that the conversation flows freely, creating better access to comprehensive answers. The interviews were conducted to get the needed detailed information and data about the project management practices within the Corporation and its sectors and centers. The interviewees are all process heads selected from each sector and the details of respondents from each sector are presented in the table 3.2. The method used to select interviewees is based on purposeful sampling where 100% of the process heads are selected.

**Table 3.2: Interviewees from Each Sector & Center**

S/N	Sectors of the Corporation	No of Interviewees
1	Corporation Head Office	2
2	Water and Energy Design and Supervision Sector	4
3	Transport Design and Supervision Works Sector	3
4	Building & Urban Design and Supervision Works Sector	3
5	Geotechnical Investigation, Geotechnical Engineering & Underground Works Center	4
6	Surveying Engineering, Geospatial and Civil Informatics Center	4
<b>Total</b>		<b>20</b>

Source: Own Survey Result (2022)

### 3.8 Reliability and Validity of Data

#### 3.8.1 Reliability of Data

Creswell (2014) underlines the value of checking validity and reliability of data in attempting to acquire meaningful interpretations. A reliability analysis is conducted to establish both the consistency and stability of the research instrument. In this case, Cronbach's alpha is used to check the validity reliability of data in this study. Cronbach's alpha is computed in terms of the average inter-correlations among the items measuring the concept. The closer the Cronbach's alpha to 1: the higher internal consistency of the variables. As can be seen in the table below the value of the Cronbach's Alpha is 0.93 showing higher internal consistency of the data.

**Table 3.3: Results of the Cronbach's Alpha**

Knowledge Area	Mean	Std. Deviation	N	Cronbach's Alpha
Project Integration Management	2.19	0.70	142.00	0.93
Project Scope Management	2.25	0.73	142.00	0.93
Project Schedule Management	2.35	0.76	142.00	0.93
Project Cost Management	2.34	0.77	142.00	0.93
Project Quality Management	2.33	0.81	142.00	0.93
Project Resources Management	2.31	0.70	142.00	0.93
Project Communication Management	2.12	0.86	142.00	0.93
Project Risk Management	1.88	0.80	142.00	0.92
Project Procurement Management	2.09	0.80	142.00	0.93
Project Stakeholder Management	2.15	0.86	142.00	0.93

Source: Own Survey Result (2022)

#### 3.8.2 Validity of Data

The validity of the data collection instrument is checked against document review and interview with process executive managers. The use of different data collection

instruments, review of secondary data and sampling techniques and high sample size ensure the validity of the data. Creswell (2009) stated that using different data collection tools helps to crosscheck information. Hence the mix of data obtained through various methods is used to triangulate the analysis and ensured reliability of the data.

### **3.9 Data Analysis**

In order to evaluate the PM maturity level of the PMO both qualitative and quantitative analysis is employed. The responses from the questionnaires is summarized and analyzed categorically against the five levels of the selected project management maturity model by PM Solutions. In order to interpret the findings of the study descriptive statistic is employed in analyzing the study and the coded data is processed using statistical software package (SPSS 26). In the descriptive statistics the tools the study used are frequency, mean and standard deviation.

The data collected are coded and analyzed using graphs, tables and percentages to provide summaries of the respondents under study. Mean is used to identify the level of project management maturity and competitive positioning of the Ethiopian Construction Design & Supervision Corporation and its four sectors. The data from interview and secondary data sources are triangulated with the questionnaire-generated data to describe the process of comparing concurrently collected qualitative findings. The secondary data helps to interpret the findings of the questionnaires and the interview from the executive process managers.

## CHAPTER FOUR

### DATA ANALYSIS AND PRESENTATION

#### 4.1 Introduction

This chapter deals with the data analysis, presentation and interpretation of primary data, which was, collected from respondents through questioner on each contents of the study from one hundred forty two respondents and interview from twenty Process Executive Managers from all sectors, centers and the corporation head office officials. All of the questionnaires were fully completed which helps the study to be considered adequate for analysis and reporting. Accordingly, the characteristics of each knowledge area with respect to the maturity level are discussed.

##### 4.1.1 Respondents Educational Background & Project Management Training

As shown in the table 4, 0.1 %, 52.1 %, 7%, .7 of the respondents have Bsc, Msc, Ma/MBa and PhD level of education respectively. Moreover, 31% of the respondents have project management training ranging from 5 days to 6months prepared by the corporation.

**Table 4.1: Education Level and Trainings on Respondents Project Management**

Education		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Bsc	57	40.1	40.1	40.1
	Msc	74	52.1	52.1	92.3
	MA	10	7	7	99.3
	PHD	1	0.7	0.7	100
	Total	142	100	100	
Training by PPMO		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	44	31.0	31.0	31.0
	N0	98	69.0	69.0	100.0
	Total	142	100.0	100.0	
Training outside the corporation		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	58	40.8	40.8	40.8
	No	84	59.2	59.2	100.0
	Total	142	100.0	100.0	

Source: Own Survey Result, (2022)

On the other hand 40.8 % of the respondents had trainings outside the corporation. The trainings they took range from a few days training up to Masters Level (Msc) of education.

#### 4.1.2 Years of Experience

According to the responses, 7% of the respondents had work experience of more than 15 years. 35% had work experience between 5 to 10 years while only 17.6 % 11 to 15 years, and & 7% had work experience less than 5 years as shown in the table 4.2.

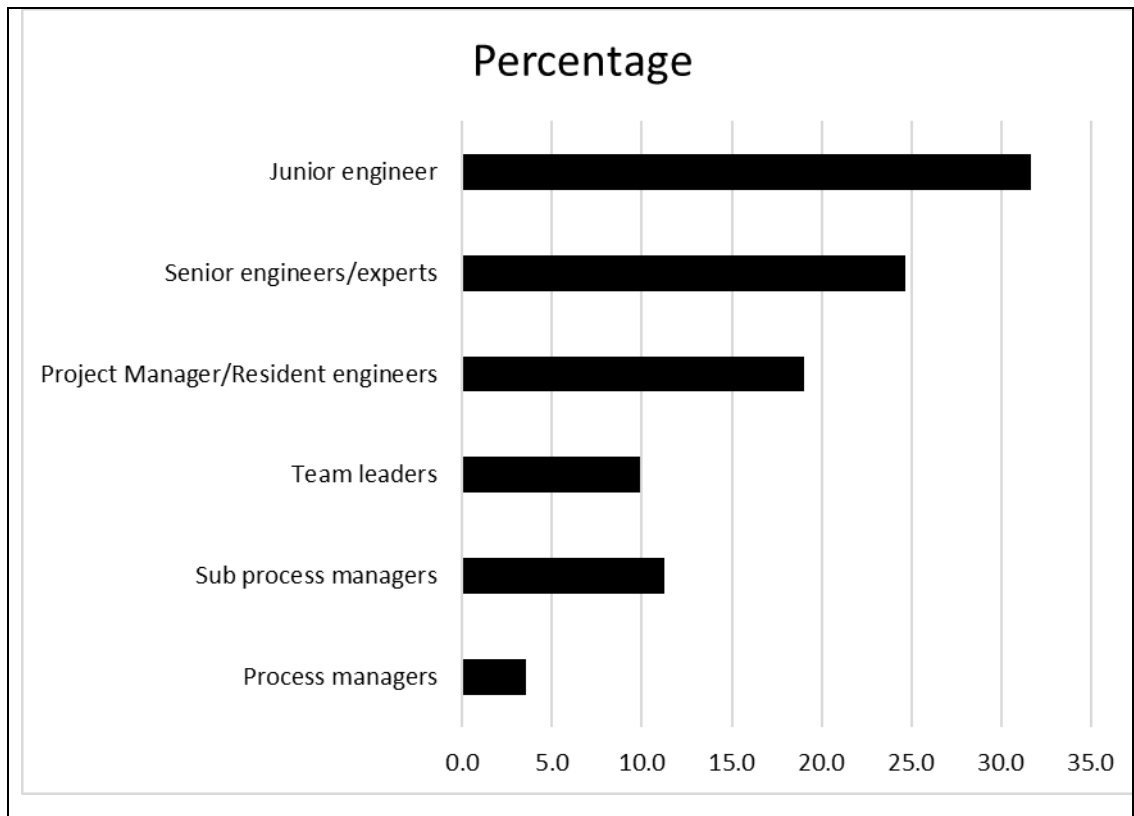
**Table 4.2: Years of Experience of Respondents**

	Years of Experience	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 5	56	39.4	39.7	39.7
	5-10	50	35.2	35.5	75.2
	11-15	25	17.6	17.7	92.9
	Greater than 15	10	7.0	7.1	100.0
	Total	141	99.3	100.0	
	Missing	1	0.70		
	<b>Total</b>	<b>142</b>	<b>100</b>		

Source: Own Survey Result, (2022)

#### 4.1.3 Respondents Current Position

The Figure 4.1 depicts the current position of respondents. The range of respondents that participate in the study varies from junior engineers to process executive managers. As shown in the graph sub process managers (11.3%), senior engineers/experts (24.6%), project managers/resident engineers (19 %) and team leaders (9.9 %) and junior engineers 31.7 %. The respondents are also from different departments of the sector offices. It ranges from finance, planning, engineering and middle level management officials.



**Figure 4.1: Current Position of Respondents**

#### **4.2 Results and Analysis of the Study**

In this part of the study the analyzed detail analysis and result of the questionnaire is administered using SPSS software. The outputs of the analysis are given in the sections below. The study presents the maturity level of the ECDSWC at corporate level in detail and the project management maturity level of the four main sectors in summarized format.

#### **4.3 Project Management Maturity Level at Corporate Level**

The maturity assessment has been performed for the ten project management body of knowledge areas covered by the research. Those are Integration management, Scope management, Schedule management, Cost management, Quality management, Communication management, Resource management, Procurement management and



Risk management. The average mean of project management body of knowledge areas is computed to analyze the project management maturity level of the corporation. The maturity level of each knowledge areas within the company estimated based on the mean value of each process of the ten knowledge areas.

**Table 4.3: Project Management Maturity of ECDSWC**

Knowledge Areas	N		Minimum	Maximum	Mean	Variance
	Valid	Missing				
Project Integration Management	142	0	1.0	4.38	2.19	0.49
Project Scope Management	142	0	1.0	4.67	2.25	0.54
Project Schedule Management	142	0	1.0	4.57	2.35	0.58
Project Cost Management	142	0	1.0	5.00	2.34	0.59
Project Quality Management	142	0	1.0	4.50	2.33	0.66
Project Resources Management	142	0	1.0	4.17	2.31	0.49
Project Communication Management	142	0	1.0	4.33	2.12	0.74
Project Risk Management	142	0	1.0	4.00	1.88	0.64
Project Procurement Management	142	0	1.0	4.00	2.09	0.64
Project Stakeholder Management	142	0	1.0	4.75	2.15	0.73
<b>Mean</b>			<b>1.0</b>	<b>4.44</b>	<b>2.20</b>	<b>0.61</b>

Source: Own Survey Result (2022)

As can be seen on the table 4.3, the corporation has an aggregate maturity level of 2.2, which is at the level of basic. When breaking down the result to see the individual result, we can see the corporation performs relatively superior in areas of schedule management (2.35), cost management (2.34), quality management (2.33) and resources management (2.31). On the contrary, the company performs the least in areas of risk management (1.88), procurement, management (2.09), communication management (2.12) and stakeholder management (2.15).

During the semi-structured interview, respondents were asked to rate the level of project management maturity of the corporation. Accordingly, five respondent said the rate of the overall maturity level of the Corporation is at Level 2, nine said

between Level 2 & 3, two said at Level 3 and the remaining four respondents didn't respond to this question.

#### **4.3.1 Project Integration Management**

Project Integration Management includes the processes and activities needed to identify, define, combine, unify and coordinate the various processes and project management activities within the project management process groups. As can be seen in the table 4.4(a), the average maturity level of project integration in ECDSWCO is 2.19.

At this level there are basic, documented processes in place for developing project plans for integrating, analyzing, and developing reports on work results (Kerzner 2013). Project monitoring and control and direct and manage project work is where the corporation works best with an average maturity of 2.5 & 2.43. Among the process the project charter development scored the lowest result.

The qualitative study has also revealed that few projects are properly closed, a standard template for project charter is not used as well as project management plan is developed for only scope, schedule, and cost management.

The organization has adopted a combined prince 2 and PMI (PMBOK) standard & practices by integrating it with ISO 9001, 2015 quality management system. As an operating procedure, the organization uses a generic project management method where the high-level structure or framework is derived from PMI (PMBOK).

**Table 4.4(a): Maturity Level of Project Integration Management of ECDSWC**

	Project Charter Development	Project Management Plan Development	Direct & Manage Project	Monitoring and Controlling Project	Manage Project Knowledge	Perform Integrated Change Control	Project or Phase Closure	Project Management Office (PMO)
Valid N	142	142	142	142	134	142	133	133
Miss N	0	0	0	0	8	0	9	9
Mean	1.89	2.15	2.43	2.5	2.28	2.05	2.19	2.07
Std. Deviation	0.968	0.902	0.948	0.995	1.023	0.977	1.095	0.979

Source: Own Survey Result (2022)

During semi-structured interviews, respondents had been asked various questions regarding project integration management-related issues. Table 7b, c & d below depicts the result of this interview.

The first question was whether the organization prepare project charter for all projects using standard template or not. Accordingly, 25% of respondents have responded that they prepare a project charter for all projects, twelve respondents (60%) reported that they don't prepare project charter for all projects. 25% of respondents have also claimed that they use standard template for the preparation of project charter development.

**Table 4.4(b): Response to Project Charter Development**

Project Charter Development	N	Yes	No	No Response
Does your organization prepare a project charter for all projects? Do you use a standard template for project charter development?	20	25%	60%	15%

Own Survey Result (2022)

The results of responses regarding project closure and documentation of lesson learnt is presented in the table 4.4(c). As shown in the table below 45% of respondents have claimed that they closed all projects and 55 % of respondents have claimed that they don't close all projects. Out of the 45% who responded yes to all project closure 60% have reported that they use standard procedure for project closing. 10% of respondents have responded that they document lesson learnt during project closure and use it for organizational processes and procedures improvement. 90% of respondents have claimed that lesson learnt are not formally captured for use in organizational process and procedure updating. They also argued that lesson learnt are informally discussed in monthly management meeting.

**Table 4.4(c): Response to Project Closure and Documentation of Lesson Learnt**

<b>Project Closure &amp; Documentation of Lesson Learnt</b>	<b>N</b>	<b>Yes</b>	<b>No</b>	<b>No Response</b>
Do you close all projects?	20	45%	55%	
Do you have standard procedures for closing?	12	60%	40%	
Do you documents lesson learnt and integrate it into the organization's processes and procedures?	20	10%	90%	

Source: Own Survey Result (2022)

The respondent's response regarding project management plan preparation is presented in table 4.4(d). 85% of respondents have argued that a project management plan is prepared for all projects and the remaining 15% have reported that they don't prepare a project management plan for all projects. 100 % of respondents have responded that a project management plan is prepared for only limited knowledge areas. They claimed that a project management plan is prepared for only scope, schedule and cost management.

**Table 4.4(d): Response to Project Management Plan Preparation**

<b>Preparation of Project Management Plan</b>	<b>N</b>	<b>Yes</b>	<b>No</b>
Does your organization prepare a project management plan for all projects?	20	85%	15%
Does it include all the relevant knowledge areas?	20	0%	100%

Source: Own Survey Result (2022)

### 4.3.2 Project Scope Management

The process of scope management involves defining the specific work. It is also creating work breakdown structure, verifying the scope and finally controlling the scope. This activity ensures tracking of all activities, and comparison of planned with what is executed. As depicted in the table 8a below, the average scope management maturity of the corporation is 2.25. This shows that a basic scope management process is in place. Project scope definition (2.35), collect requirements (2.31) and control scope (2.30) is where the corporation works best. Plan scope management maturity level is the lowest with a score of 2.14.

**Table 4.5(a): Maturity Level of Project Scope Management of ECDSWC**

		<b>Plan Scope Management</b>	<b>Collect Requirements</b>	<b>Define Scope</b>	<b>Create WBS</b>	<b>Validate Scope</b>	<b>Control Scope</b>
N	Valid	142	137	141	142	142	142
	Missing	0	5	1	0	0	0
Mean		2.14	2.31	2.34	2.20	2.21	2.30
Std. Deviation		.972	.896	.893	.861	.944	.905

Source: Own Survey Result (2022)

Table 4.5(b), presents respondents' responses regarding the scope management plan. According to table 8b, 30% of respondents have reported that they use a standard procedure for collecting requirements. 70% of respondents have claimed that the

corporation don't use standard methodologies to capture scope requirements and they also claimed that scope is defined by the Corporation's clients in their tender documents, terms of reference or request for proposal documents.

65% of respondents also reflected that scope changes are managed when they occur and in a reactive manner depending upon the situation and the magnitude of changes. And, 35% of respondents have reported that they use formal procedures to manage changes. 70% of respondents have claimed that major scope changes are managed using formal methods like letters and amendments to contracts. 10% of respondents have also reported that there is a formal change management procedure or structure in the organization and 90% of respondents have responded that there is no formal change control board or similar structure in the corporation.

**Table 4.5(b): Response to Scope Management Plan**

<b>Scope Management Plan</b>	<b>N</b>	<b>Yes</b>	<b>No</b>
Is there a standard form/ guideline or procedure for collecting requirements?	20	30%	70%
Do you use formal procedures to manage changes?	20	35%	65%
How do you manage and control scope/scope changes?	20	70%	30%
Do you have a change control board or other forms of standard change management procedure or structure?	20	10%	90%

Source: Own Survey Result (2022)

### **4.3.3 Project Schedule Management**

According to (PMI, 2017) project schedule management includes the processes required to manage the timely completion of the project. Project schedule management includes the processes required to manage the timely completion of the

project. As can be seen from table 9a, the schedule management average maturity level of the corporation is 2.35. Activities are more or less well defined, sequenced and their duration is well estimated. Schedule management is relatively the best areas the corporation performs. Schedule development (2.44), activity sequencing (2.42), and activity definition (2.36) scores highest maturity level.

**Table 4.6(a): Maturity Level of Project Schedule Management of ECDSWC**

		Plan schedule management	Activity definition	Activity sequencing	Estimate activity resource	Estimate activity duration	Schedule development	Schedule Control
N	Valid	142	142	142	142	142	142	142
	Missing	0	0	0	0	0	0	0
Mean		2.34	2.36	2.42	2.27	2.30	2.44	2.35
Std. Deviation		.882	.886	.948	.876	.915	.949	.969

Source Own: Survey Result (2022)

As shown in table 4.6(b), 40 % of respondents have claimed that they use standard software for tracking and controlling schedules. Respondents were also asked how they defined schedules and all respondents have reported that the overall project schedules are defined by the corporate clients and project managers prepared the detailed work-break down structures to suit the client's requirement.

**Table 4.6(b): Response to Project Schedule Management**

Schedule management	N	Yes	No
Does your organization utilize some form of standard software for defining, tracking and controlling schedule?	20	40%	60%

Source Own: Survey Result (2022)

#### 4.3.4 Project Cost Management

Project cost management includes the processes involved in planning, budgeting, financing, funding, managing, and controlling costs so that the project can be completed

within the approved budget (PMI, 2017). Table 10a shows that the company scored average maturity of 2.34. Cost control (2.27) and cost management planning (2.28) scores are the lowest maturity level. Budget determination with a score of 2.49 is where the company performed highest compared to other processes.

**Table 4.7(a): Maturity Level of Project Cost Management of ECDSWC**

		<b>Plan Cost Management</b>	<b>Estimate Cost</b>	<b>Determine Budget</b>	<b>Control Cost</b>
N	Valid	142	142	142	141
	Missing	0	0	0	1
	Mean	2.28	2.30	2.49	2.27
	Std. Deviation	.978	.905	.966	.948

Source: Own Survey Result (2022)

Table 4.7(b), depicts the response regarding the project cost management plan. 55% of respondents have responded that there is a standard procedure and software in estimating project costs and 45% of respondents have claimed that they do not use standard procedures in project cost estimating.

**Table 4.7(b): Response to Project Cost Management Plan**

<b>Cost management</b>	<b>N</b>	<b>Yes</b>	<b>No</b>
Does your organization use standard procedures and software to conduct project cost estimates?	20	55%	45%
Does your organization tracks costs against the base line and project performance?	20	70%	30%
Does your organization apply methods such as earned value against planned value? Cost at completion and other cost & benefit tracking methods?	20	25%	75%

Source: Own Survey Result (2022)



70% of respondents have claimed that the organization regularly tracks costs against the baseline and. 30% of respondents claimed that there is no tracking of costs against the baseline. 25% of respondent have reported that the organization uses cost benefit analysis in all projects. 75% of the respondents have responded that there is no cost & benefit tracking methods that is applied in the project they are undertaking.

#### 4.3.5 Project Quality Management

Project quality management is ensuring quality planning, quality assurance, and control. Table 11a below depicts that the average quality management maturity of the corporation is 2.33. This is one of the highest score compared to other knowledge areas.

The corporation has a quality management manual and is certified for ISO 2015. The Quality Management Plan (QMS) has standardized work flow for every knowledge area called Generic Project Management Operation Procedure that shows the process flow, inputs, and outputs.

**Table 4.8(a): Maturity Level of Project Quality Management of ECDSWC**

		<b>Plan quality management</b>	<b>Perform quality assurance</b>	<b>Control quality</b>	<b>Management Insight</b>
N	Valid	142	142	142	141
	Missing	0	0	0	1
Mean		2.15	2.37	2.43	2.38
Std. Deviation		.930	.912	.970	.969

Source: Own Survey Result (2022)

The response regarding project quality management is depicted in the table 4.8(b). 95% of respondents have claimed that there is standard quality management procedures and metrics in the organization. 5% of the respondents claimed that there is no quality management procedure in the corporation. 15 out of the 20 respondents have claimed that they did not take enough time to internalize this standard processes.

As a result the process and procedures outlined in the project quality management isn't widely and fully used in the projects the corporation is undertaking.

**Table 48(b): Response to Project Quality Management**

<b>Quality Management</b>	<b>N</b>	<b>Yes</b>	<b>No</b>
Do you have standard quality management procedures and metrics?	20	95%	5%

Source: Own Survey Result (2022)

#### **4.3.6 Project Resource Management**

Project Resource Management includes the processes to identify, acquire, and manage the resources needed for the successful completion of the project. Resources management ensures the acquisition of resources, teams' planning, estimating, acquiring, developing, managing and controlling. ECDSWC showed an average of 2.31 maturity level in managing its resources.

The corporation performs high in developing (2.39) and managing team (2.42) relative to other processes. The corporation resources management practice is at basic level, where management understands the need to improvement and has committed to develop enterprise wide resources planning software (ERP) to plan and manage its resources but its utilization and its effect is not yet visible.

**Table 4.9(a): Maturity Level of Project Resource Management of ECDSWC**

		Estimate	Acquire	Develop	Manage	Control
	Plan Resource	activity	Resources	Project team	Project team	Resources
	Management	Resources				
N Valid	142	139	142	142	142	138
Missing	0	3	0	0	0	4
Mean	2.20	2.27	2.28	2.39	2.42	2.30
Std. Deviation	.855	.873	.886	.882	.869	.955

Source: Own Survey Result (2022)

Response regarding project resources management is presented in the table 4.9(b). Accordingly, 60% of the respondents have reported that there is formal resources planning procedure at the corporate level. On the other hand 40% of respondents have claimed that there is no formal and standardized resources planning procedure.

**Table 4.9(b): Response on Resources Management Planning**

Resources Plan Management	N	Yes	No
Do you have a standard form for resources planning?	20	40%	60%

Source Own: Survey Result (2022)

#### 4.3.7 Project Communication Management

Project Communications Management includes the processes necessary to ensure that the information needs of the project and its stakeholders are met through the development of artifacts and the implementation of activities designed to achieve effective information exchange.

As can be seen from Table 10(a), the average maturity of communication management ECDSWCO is 2.12. Communication management is one of the PM areas where the corporation performs relatively poor compared with other knowledge areas.

**Table 4.10(a): Maturity Level of Project Communication Management of ECDSWC**

		<b>Plan communications management</b>	<b>Manage communications</b>	<b>Control communications</b>
N	Valid	142	142	142
	Missing	0	0	0
Mean		2.08	2.18	2.12
Std. Deviation		.946	.894	.993

Source: Own Survey Result (2022)

According to table 13b. 35% of interviewees have reported that there is formal and standardized procedure for project communication management plan. On the other hand 65% of the respondents have reported that there is no formal procedure for communicating planning.

**Table 10(b): Response on Project Communication Plan**

<b>Project Communication Plan</b>	<b>N</b>	<b>Yes</b>	<b>No</b>
Do you have a standard form for communication planning?	20	35%	65%

Source: Own Survey Result (2022)

#### **4.3.8 Project Risk Management**

Project Risk Management includes the processes of conducting risk management planning, identification, analysis, response planning, response implementation, and monitoring risk on a project. Table 4.11(a) depicts that corporation scored the lowest of during the assessment of risk management. This means the average maturity level of risk management is approximately 1.88. Furthermore, the comparative score of plan risk management (1.80) and perform quantitative risk analysis (1.82) is the lowest when compared with other process groups.

**Table 4.11(a): Maturity Level of Project Risk Management of ECDSWC**

	Plan risk Management	Identify Risks	Perform Qualitative Risk Analysis	Perform Quantitative Risk Analysis	Plan Risk Responses	Implement Risk Response	Monitor Risks
N Valid	142	142	142	142	142	142	142
Missing	0	0	0	0	0	0	0
Mean	1.80	1.96	1.92	1.82	1.84	1.89	1.90
Std. Deviation	.893	.937	.879	.872	.920	.973	.955

Source: Own Survey Result (2022)

Respondents were asked whether there is a risk response plan in the organization. 55% respondents have claimed that there is no formal procedure in defining project risks and preparing a risk response. 45% of respondents have claimed that there is some form of risk planning during project kick off meeting on large and visible projects. Respondents were asked whether the risk register is updated regularly. 90% of the respondents have reported that risk registers are not updated regularly. 10% of the respondents have claimed that the risk register is updated. Respondents were also asked whether risk owner is assigned for large and complex projects. 90% of respondents have claimed that there is no assignment of risk owner for large and complex projects. 10% of respondents have claimed that it is the duty of the project manager to track issues, and manage risks.

**Table 4.11(b): Response on Project Risk Management**

Risk management	N	Yes	No
Does your organization have risk response plan?	20	45%	55%
Does the organization regularly update the risk register?	20	10%	90%
Does your organization assign risk owner for large & complex projects?	20	10%	90%

Source: Own Survey Result (2022)

### 4.3.9 Project Procurement Management

Project procurement management is planning and controlling procurement & contract management and closing procurement process formally. As can be seen on the Table 4.12(a), the company scored an average of 2.09 in the area of procurement management. According to the assessment, ECDSWCO performs poor in managing its project procurement compared to other knowledge areas.

**Table 4.12(a): Maturity Level of Project Procurement Management of ECDSWC**

		<b>Plan Procurement Management</b>	<b>Conduct Procurements</b>	<b>Control Procurements</b>
N	Valid	142	142	142
	Missing	0	0	0
Mean		2.06	2.14	2.07
Std. Deviation		.881	.864	.904

Source: Own Survey Result (2022)

Respondents' response regarding project procurement management plan is depicted in the table 15b. Almost all respondents (95%) reported that there is no standardized procedure for procurement planning. Interviewee has indicated that the corporation needs to improve its procurement planning; many activities are delayed due to poor procurement management. They also confirmed that procurement procedure is highly centralized and many projects are delayed due to availability of basic resources/services that has to be procure for project operations.

**Table 4.12(b): Response on Procurement Management Plan**

<b>Procurement Management</b>	<b>N</b>	<b>Yes</b>	<b>No</b>
Does your organization have standard procurement management plan	20	5%	95%

Source: Own Survey Result (2022)

#### 4.3.10 Project Stakeholder Management

Project Stakeholder Management includes the processes required to identify the people, groups, or organizations that could impact or be impacted by the project, to analyze stakeholder expectations and their impact on the project, and develop appropriate management strategies for effectively engaging stakeholders in project decisions and execution (PMI 2017). As can be seen in the table 4.13(a), the corporation stakeholders management maturity level is 2.15 which is the lowest level compared to other knowledge areas. Stakeholder identification scored the highest (2.2) as compared to other processes in this knowledge area.

**Table 4.13(a): Maturity Level of Project Stakeholder Management of ECDSWC**

		Identify Stakeholders	Plan Stakeholder Management	Manage Stakeholder Engagement	Control Stakeholder Engagement
N	Valid	142	142	142	142
	Missing	0	0	0	0
Mean		2.20	2.15	2.15	2.08
Std. Deviation		1.007	.914	.984	.986

Source: Own Survey Result (2022)

Table 16b presents the response of interviewees on stakeholder's management plan. 75% of interviewees responded that there is a practice of stakeholder identification during project initiations. On the other hand 25% of respondents have reported that there is no practice of stakeholder identification during project initiation. Respondents were also asked whether they use standard template for stakeholder identification. 30% of respondents said that they use standard template and procedure for stakeholder's identification. On the other hand 70% of respondents claimed that there no standard procedure for stakeholders identification. On the other hand 20% of respondents have reported that they use standard procedure for stakeholder

management plan development. The rest 80% have said that they don't use standard stakeholder management plan development.

**Table 4.13(b): Response on Stakeholders Management Plan**

<b>Stakeholders Management</b>	<b>N</b>	<b>Yes</b>	<b>No</b>
Do you identify stakeholders during project initiation?	20	75%	25%
Do you have standard template for stakeholders' identification and registration?	20	30%	70%
Is there a standard procedure to develop stakeholder management plan?	20	20%	80%

Source: Own Survey Result (2022)

#### **4.4 Project Management Maturity of the Major Sectors of the Corporation**

In addition to the project management maturity of the corporation, analysis is done on the four sectors of the corporation individually. Accordingly, the project management maturity of the Water & Energy Works Design and Supervision Sector (WEDSWS), Building and Urban Design & Supervision Works Sector (BUDSWS), Transport Design & Supervision Works Sector (TDSWS) and Geotechnical Investigation, Geotechnical Engineering and Under Ground Design and Supervision Works Sector (GGUDSWS).

##### **4.4.2 Project Management Maturity of Water & Energy Works Design and Supervision Sector**

As seen from table 4.14 the WEDSWS average project management maturity level is 2.36. This sector has the highest maturity level among the four sectors of the corporation. The study reveals the sector exhibit the highest score in schedule management (2.58), cost management (2.57) and quality management (2.46). On the



other hand risk management (1.98), and communication management (2.2) scores are the lowest. Even if the schedule management score is 2.58 there is still a very serious problem in completing projects on schedule as indicated during the interview with executive process heads.

**Table 4.14: Project Management Maturity of WEDSWS**

<b>Knowledge Areas</b>	<b>N</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Mean</b>	<b>Std. Deviation</b>
Project Integration Management	32	1.00	3.25	2.28	0.58
Project Scope Management	32	1.00	4.00	2.40	0.76
Project Schedule Management	32	1.00	4.00	2.58	0.80
Project Cost Management	32	1.00	5.00	2.57	0.97
Project Quality Management	32	1.00	4.00	2.46	0.75
Project Resources Management	32	1.00	4.00	2.43	0.79
Project Communication Management	32	1.00	4.00	2.20	0.95
Project Risk Management	32	1.00	4.00	1.98	0.92
Project Procurement Management	32	1.00	4.00	2.28	0.87
Project Stakeholder Management	32	1.00	4.00	2.38	1.08
<b>Mean</b>	<b>32</b>			<b>2.36</b>	<b>0.85</b>

Source: Own Survey Result (2022)

#### **4.4.3 Building and Urban Design and Supervision Sector (BUDSWS)**

The building & urban design & supervisor sector average maturity is the lowest among out of the major four sector of the organization (table 4.15). The average maturity level of BUDSWS is 2.07. Quality management (2.31) and schedule management (2.24) show relatively the highest score. On the other hand risk management (1.72), procurement management (1.93) integration management (2.04), cost management (2.04), and communication management (2.05) are the lowest score. The study reveals that all knowledge areas maturity score of BUDSWS is the lowest among all sectors of the corporation.

**Table 4.15: Project Management Maturity of BUDSWS**

<b>Knowledge Areas</b>	<b>N</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Mean</b>	<b>Std. Deviation</b>
Project Integration Management	36	1.00	4.13	2.04	0.75
Project Scope Management	36	1.00	4.67	2.07	0.67
Project Schedule Management	36	1.00	4.57	2.24	0.73
Project Cost Management	36	1.00	3.71	2.04	0.63
Project Quality Management	36	1.00	4.50	2.31	0.95
Project Resources Management	36	1.00	4.17	2.17	0.71
Project Communication Management	36	1.00	4.33	2.05	0.86
Project Risk Management	36	1.00	4.00	1.72	0.84
Project Procurement Management	36	1.00	3.67	1.93	0.74
Project Stakeholder Management	36	1.00	4.75	2.17	0.82
<b>Mean</b>				<b>2.07</b>	<b>0.77</b>

Source: Own Survey Result (2022)

#### 4.4.4 Transport Design & Supervision Sector (TDSWS)

According to table 4.16 TDSWS score of the average maturity level is 2.31. The sector scores the second highest score among the major sectors of the corporation. The study also reveals that schedule management (2.5), scope management (2.44), cost management (2.44), and resources management (2.42) scores are the highest. On the other hand risk management (2.02), communication management (2.06) and stakeholder management (2.18) show the lowest level of maturity. The Transport Design and Supervision Sector is the only sector that score above 2 in risk management maturity.

**Table 4.16: Maturity Status TDSWS**

<b>Knowledge Areas</b>	<b>N</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Mean</b>	<b>Std. Deviation</b>
Project Integration Management	26	1.00	3.50	2.32	0.64
Project Scope Management	26	1.00	4.00	2.44	0.76
Project Schedule Management	26	1.00	4.14	2.50	0.85
Project Cost Management	26	1.00	3.34	2.44	0.61
Project Quality Management	26	1.00	3.75	2.35	0.67
Project Resources Management	26	1.00	3.50	2.42	0.63
Project Communication Management	26	1.00	3.33	2.06	0.75
Project Risk Management	26	1.00	3.29	2.02	0.65
Project Procurement Management	26	1.00	3.67	2.37	0.77
Project Stakeholder Management	26	1.00	4.00	2.18	0.80
<b>Mean</b>				<b>2.31</b>	<b>0.71</b>

Source: Own Survey Result (2022)

#### 4.4.5 Geotechnical Investigation Geotechnical Engineering and Under Ground Design and Supervision Works Sector (GGUDSWS)

Geotechnical Investigation Geotechnical Engineering and Under Ground Design and Supervision Works Sector is the last sector the study analyzes. As depicted in table 20 the average maturity of the sector is 2.14. This sector ranks 3<sup>rd</sup> in the overall maturity among the four sectors of the corporation. As per the findings of this study GGUDSWS performs highest in the areas of cost management (2.36) quality management (2.26), resources management (2.26), and schedule management (2.21). On the other hand risk management (1.85), procurement management (1.93) and stakeholder management (1.96) scores are the lowest. This is the only sector that scores very low in stakeholder management and procurement management.

**Table 4.17: Maturity Status of GGUDSWS**

Knowledge Areas	N	Minimum	Maximum	Mean	Std. Deviation
Project Integration Management	48	1.00	4.38	2.18	0.76
Project Scope Management	48	1.00	3.67	2.17	0.72
Project Schedule Management	48	1.00	4.00	2.21	0.67
Project Cost Management	48	1.00	4.00	2.36	0.73
Project Quality Management	48	1.00	4.25	2.26	0.82
Project Resources Management	48	1.00	3.67	2.26	0.67
Project Communication Management	48	1.00	4.00	2.17	0.87
Project Risk Management	48	1.00	3.71	1.85	0.76
Project Procurement Management	48	1.00	4.00	1.93	0.76
Project Stakeholder Management	48	1.00	3.50	1.96	0.72
<b>Mean</b>				<b>2.14</b>	<b>0.75</b>

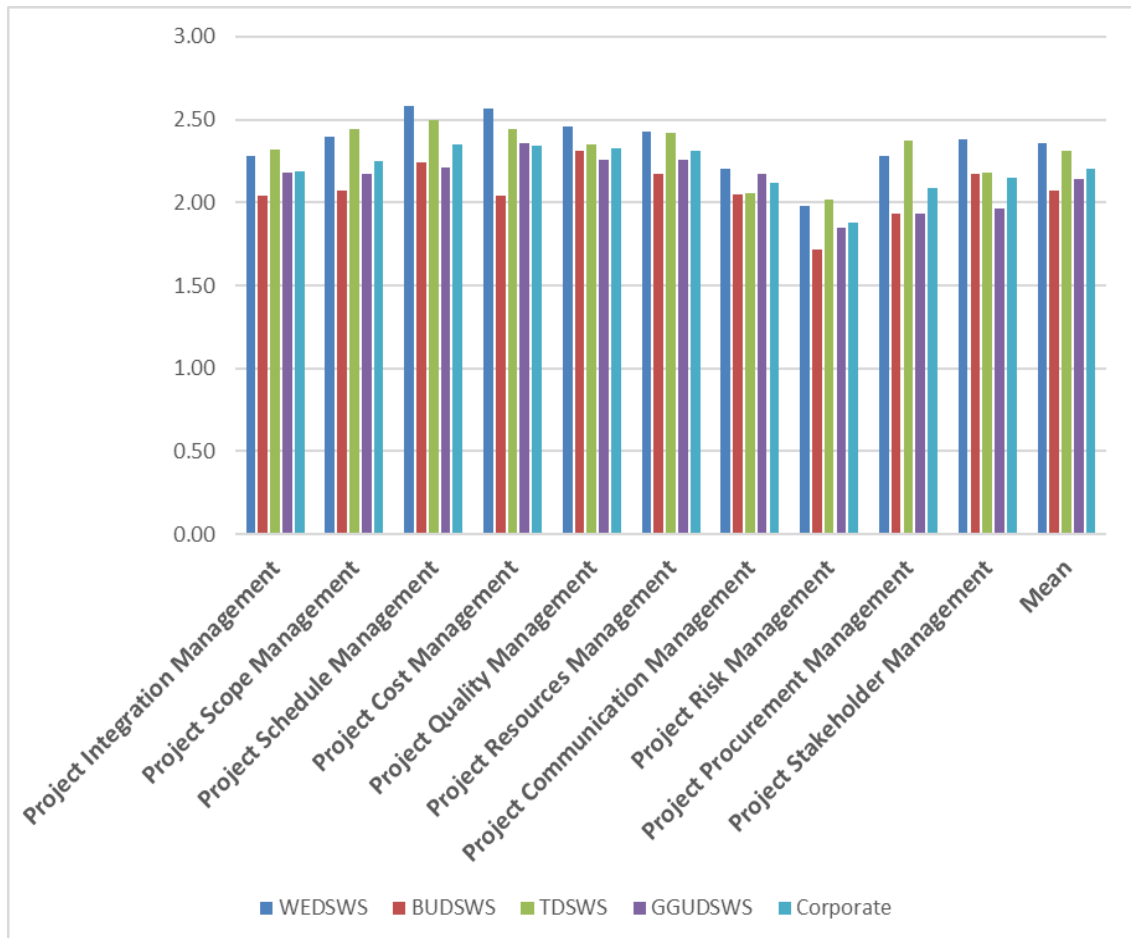
Source: Own Survey Result (2022)

#### 4.5 Discussion of the Findings

This section discusses several important observations based on the results of this study.

This research provides the project management maturity level of the corporation and its

four sectors. This research is conducted based on the model provided by PM solution maturity. The discussion provides the result of the study made using responses from 142 respondents using structured questionnaires and semi structured interview of two senior executive management officials and eighteen process executive managers.



**Figure 4.2: Project Management Maturity Level of the ECWDSC**

As can be seen in the figure 4.2, the corporation has an aggregate maturity level of 2.2, which is at the level of basic. In addition to the project management maturity of the corporation, analysis is done on the four sectors of the corporation. Accordingly, Water & Energy Works Design and Supervision Sector (WEDSWS) scored 2.36, Building and Urban Design & Supervision Works Sector (BUDSWS) scored 2.07, Transport Design & Supervision Works Sector (TDSWS) scored 2.31 and.

Geotechnical Investigation, Geotechnical Engineering and Under Ground Design and Supervision Works Sector (GGUDSWS) scored 2.14 in their project management maturity. It can be generalized that the corporation project management maturity level is at level 2.

Generally, the knowledge areas of schedule management, quality management, and resource management have shown comparatively higher maturity level compared with other PM knowledge areas. Further, the respondents consider the above knowledge areas are being practiced well whereas the knowledge areas of risk management, procurement management, communication and stakeholder's management are found to be comparatively at lower level of maturity.

Mullaly and Thomas (2010) gave clear distinction to level-2 as stages where organizations experience some degree of incomplete project management practices. This practice is not consistently implemented across the organization or, however, efforts to form some level of organizational formality, not comprehensively applied. At this level of maturity the corporation had realized that common methodologies and processes are needed such that managerial success on one project can be repeated on other projects.

This is verified during in our interactions (interview sessions with respondents) and review of documents. The preparation of ERP (enterprise wide resources planning), the ongoing development of (UPMIS) unified project management information system software as well as the adopted QMS (quality management systems) with generic tools and processes are proof that the corporation has understood the need for

structured processes, tools and methods for effective and efficient project management system and hence higher maturity level and successful delivery of projects as per the estimated schedule, cost and quality.

There are various studies that supported the findings of this study. The result of the study is in line with the research made on the challenges of construction industry in Ethiopia (Ayalew, Dakhli, & Lafhaj, 2016). The study results revealed that the level of construction project management practice in terms of adapting general project management procedures, project management functions, tools & techniques to be unsatisfactory. Particularly, the level of practice in terms of safety, risk and time management was found to be very low. The amount of schedule slippage ranges between 61-80% and that of planned costs and other variables such as risk, quality, resources utilization and safety deviates in the range 21-40% from predetermined requirements or anticipated at the beginning of the project.

The result of the study is also coherent with researcher result done by Hailemarkos (2020) on 193 project managers working with contractors, consultants, and clients in Ethiopia. The study has found that the practice of effective project delivery in time, cost, and quality remains a challenge due to low level of project management maturity.

The other study that supports the result of this research is: a study on the Ethiopian construction industry titled “Project management maturity in the construction industry of developing countries: The case of Ethiopian contractors” Yimam (2011). The research showed that much of the knowledge areas of the PMBOK guide are

implemented informally. In addition the research revealed that the construction PM process maturity and practices maturity of the contractors found to be at low level with an average maturity of 1.30 in a scale of 1 to 5, but contractors/consultants with ISO certification has a higher level of maturity.

The findings of this study is also in line with the recent researches conducted by Tegegn, (2022), Bisrat (2020), Mahlet (2019), and Rahel (2017) on various project management related issues of the corporation (ECDSWC). According to Tegegn (2022) the level of project management of the ECWDSW is 2.2. Further the study revealed that project integration management maturity level of the corporation (2.22) which has a strong correlation with project success criteria's; namely compliance with cost, schedule and quality.

The study demonstrated that the level of compliance with cost, schedule and quality is 2.74. This is interpreted as the project management success of the corporation is between poor (2) and moderate (3) in a one to five ranking scale indirectly showing the low level project management maturity of the corporation. A study by Bisrat (2020) had concluded that the overall project management body of knowledge areas practice of the corporation is at basic level of maturity. This study revealed that the level of practice of activities related to risk, procurement, communication, project control, cost, time and documentations is low.

Another research was conducted by (Mahlet, 2019) on the stakeholder management practice and challenges in ECDSWC. The research concluded that the organization focuses more on managing internal stakeholders that have contractual relationships

than external. Also, the survey discovered that there is very little adaptation of stakeholder management practices in the corporation.

Rahel (2017) worked on the assessment of the quality management practice of ECDSWC. The study concluded that although the organization has adopted ISO 9001:2008 quality management system, there are problems in the implementation of the system. The study also showed that top management is more committed to the project quality planning process than quality assurance and quality control. Moreover, employee's participation in quality programs & awareness on their contribution to project quality is low. Generally the project management maturity level of the corporation is at the basic level of maturity where formalized, standardized practice of the knowledge areas is absent.



## **CHAPTER FIVE**

### **SUMMARY, CONCLUSION, AND RECOMMENDATIONS**

#### **5.1 Introduction**

This chapter presents the summary of the major findings of the data analysis. Based on the findings conclusions are drawn about the project management practice within ECDSWC. The recommendations that can help to improve the project management practice within the corporation are presented. Finally a recommendation for future course of action is presented.

#### **5.2 Summary of Major Findings**

The study has been done in order to meet the basic objectives of the study, which are assessing the maturity level of the ten project management knowledge areas and determine the maturity level of the corporation and its sectorial divisions. According to the results and discussion of the study, the following conclusions have been made. Based on the study findings the project management maturity of ECWDSWC is 2.2. When breaking down the result to see the individual result, we can see the corporation performs relatively superior in areas of schedule management (2.35), cost management (2.34), quality management (2.33) and resources management (2.31). On the contrary, the company performs the least in areas of risk management (1.88), procurement, management (2.09), communication management (2.12) and stakeholder management (2.15). The study concluded that the corporation at the earliest maturity level of 2. The study also analyses the maturity level of the four sectors, and has found the following results. The WEDSWC scores 2.36, BUDSWC scores 2.07, TDSWC scores 2.31 and GGUDSWS 2.14.

### **5.3 Implications of the Findings**

As discussed above the level of project management of the corporation as well as its sectors is at basic level with disparities within the knowledge areas. The corporation is given responsibility to design and supervisor mega projects that are needed to meet the objectives of the grand transformation of the country. Moreover, the corporation has a “vision to becoming knowledge-based, dependable, innovative and world-class consulting firm by 2025 with a mission to provide Study, Design, Supervision and Contract Administration Services in Water, Transport, Building and other related engineering works with efficient and effective certified services in accordance with national and international standards, etc.”

The result of the study had revealed that the corporation is far from its assigned responsibility by the government of Ethiopia as well as its stated vision and objectives. During this study the researcher has found that the corporation has a huge mass of highly trained experts and professionals as well as facilities and infrastructures to fulfill its vision and responsibility.

The ECDSWC is supposed to pace the project management maturity practice development of the country by setting higher standards processes and exemplary practices. However, this study reveals something that is far from the desired level of maturity. The corporation top as well as middle level management personnel has to understand where the corporation stands and where it is supposed to go. It is required that the corporation has to devise a project management maturity strategic plan, align with the existing strategic plan and act accordingly. This study also can be used to

imply the poor level of construction project management maturity and practice of the country.

#### **5.4 Conclusion**

This research has tried to assess the project management maturity level of the Ethiopian Construction Works Corporation and its four main sectors. Further, the research has provided benchmark data on the current status of PM practice of the corporation and its major sectors for use in continuous assessment of future improvement efforts. Organizations, which are initiating and implementing projects should look forward for better project management maturity as empirical studies show a strong relation between project management maturity level and meeting project goals. The corporation and its sectors have a maturity status of level two where standardization of processes are at the initial phase.

The study concluded that on average the corporation overall PM maturity and its sectorial divisions are at basic level, which needs striving for better maturity to reach organizational standards. This means on average the organization performs the knowledge areas without following a structured approach or guideline, relying solely on the knowledge and experience of the project manager or project team leaders, and on average the corporation and its sectors are performing only the basic practices under each knowledge area. The findings also revealed that the aggregate level of PM maturity of ECWDSWC is two. The study leads to the conclusion that the current research supports the need for a methodology that can bridge the existing gap in the maturity of project management to the next level of maturity (level three).

## **5.5 Recommendation**

All PMI's processes may not be required in defining and managing all activities of the corporation. Some addition, deletion and modification might be required to fit the existing and future aspiration of the corporation. However, analyzing the project management maturity of the corporation using this process is easy and straight forward. Based on the result of the study the following recommendations are forwarded.

- (i) Project Risk Management, Project Communication Management & Project Stakeholder practise has to be developed and improved.
- (ii) The corporation annual training programme should be assessed and revised to fit the existing and future requirements of project management maturity.
- (iii) The project management office of the corporation as well as the sector offices should be strengthened with trained personnel and also should be given mandate to enforce the standardization of the of project management practice.
- (iv) The existing quality management system (QMS) has to be adopted and practiced in the project management practices of all sectors and centres of the corporation.
- (v) The in house developed ERP system has to checked and its full utilization has to be assured, the same could be mandated to corporate and sector level PPMO. The ongoing development of UPMIS has to be speeded up and its utilization has to be assured.

## **5.6 Limitations of the Study**

Any research project like any other project endeavor could not be without shortcomings due to various reasons such as cost, time selection of survey models etc. For example this

research uses PM solution maturity assessment model among the various available models. This model is in line with the project management knowledge areas and readily available. The study focuses only on project management maturity alone and did not analyze the programme, portfolio and organization level of maturity.

### **5.7 Suggested areas for Further Studies**

The discipline of project management has not been studied well in our nation; its application even less so. As a result future research has a lot of ground to cover in assessing the applicability of the discipline, the benefits organizations could reap from it, how they could fall into line with the project management concepts and so on. The researcher recommends future research different areas of project management such as program and portfolio management be done in the corporation. Moreover, more extensive research can be conducted in detail by including various parties within the Ethiopian construction industry to solve the project management problem. Besides, further studies could be done to search and solve gaps within the current project management standard and practice adopted by ECDSWC.

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## APPENDICES

### Appendix I: Personal Information

1. Your service year in the Ethiopian Construction Design and Supervision Works Corporation (ECDSWC): \_\_\_\_\_ years.
2. Your experience as Project Manager \_\_\_\_\_ (**please specify the year if you have experience**).
3. Please state your current position \_\_\_\_\_
4. Please state your educational level \_\_\_\_\_
5. Do you have a formal training, outside the office, in project management?
  - a. Yes
  - b. No

If yes, please specify the type and level of training you received

\_\_\_\_\_
6. Have you taken trainings related to Project Management provided by the Program and Project Management Office?
  - a. Yes
  - b. No
7. Gender
  - a. Female
  - b. Male

**Part II: Assessment of the Maturity Level of each Knowledge Area(Please elect and thick only one of the levels that you think fits the organization level parallel to each process)**

## Part II: Assessment of the Maturity Level of each Knowledge Area

Please score/rate for each question under the heading of the main project management body of knowledge areas indicated in the table below. To guide your decision, the definition of each maturity level has been given as follows: -

No.	PMI knowledge areas	PM solutions maturity levels				
		1	2	3	4	5
		Initial process	Structured Process	Organizational Standard	Managed process	Optimized Process
4	<b>Project Integration Management</b>					
4.1	Develop Project charter					
4.2	Develop project management plan					
4.3	Direct and Manage Project Work					
4.4	Monitor and control Project Work					
4.5	Manage Project Knowledge					
4.6	Perform Integrated change control					
4.7	Close Project or Phase					
4.8	PMO					
5	<b>Project Scope Management</b>					
5.1	Plan Scope Management					
5.2	Collect requirements					
5.3	Define Scope					
5.4	Create WBS					
5.5	Validate Scope					
5.6	Control Scope					
6	<b>Project Schedule Management</b>					
6.1	Plan schedule management					
6.2	Activity definition					
6.3	Activity sequencing					
6.4	Estimate activity resource					
6.5	Estimate activity duration					

No.	PMI knowledge areas	PM solutions maturity levels				
		1	2	3	4	5
		Initial process	Structured Process	Organizational Standard	Managed process	Optimized Process
6.6	Schedule development					
6.7	Schedule Control					
7	<b>Project Cost Management</b>					
7.1	Plan Cost Management					
7.2	Estimate Cost					
7.3	Determine Budget					
7.4	Control Cost					
8	<b>Project Quality Management</b>					
8.1	Plan quality management					
8.2	Perform quality assurance					
8.3	Quality control					
9	<b>Project Resource Management</b>					
9.1	Plan Resource Management					
9.2	Estimate activity Resources					
9.3	Acquire Resources					
9.4	Develop Project team					
9.5	Manage Project team					
9.6	Control Resources					
10	<b>Project Communications Management</b>					
10.1	Plan communications management					
10.2	Manage communications					
10.3	Control communications					
11	<b>Project Risk Management</b>					
11.1	Plan risk Management					
11.2	Identify risks					
11.3	Perform Qualitative risk Analysis					
11.4	Perform Quantitative Risk Analysis					
11.5	Plan risk responses					
11.6	Implement Risk response					



No.	PMI knowledge areas	PM solutions maturity levels				
		1	2	3	4	5
		Initial process	Structured Process	Organizational Standard	Managed process	Optimized Process
11.7	Monitor risks					
12	<b>Project Procurement Management</b>					
12.1	Plan Procurement					
12.2	Conduct Procurements					
12.3	Control Procurements					
13	Project Stakeholder Management					
13.1	Identify Stakeholders					
13.2	Plan Stakeholder Management					
13.3	Manage Stakeholder Engagement					
13.4	Control Stakeholder Engagement					

### Part III: Semi Structured Interview Questions

1. Project charter development
  - 1.1. Does your organization prepare project charter for all projects? Do you use standard template for project charter development?
  - 1.2. Do you identify stakeholders during project initiation? Do you have standard template for stakeholders' identification and registration?
  - 1.3. Do you close all projects? Do you have standard procedures for closing?
  - 1.4. Do documents lesson learnt and integrate it to the organization process and procedures?
2. Does your organization prepare project management plan for all projects?
  - 2.1. Does it include all the relevant subsidiary documents?

- 2.2. Does it clearly define the business need and outcome of the project to the overall financial, strategic and other benefits to the company? Does your organization regularly update the project management plan?
3. Scope management
  - 3.1. Is there a standard form/ guideline or procedure for collecting requirements?
  - 3.2. How do you manage and control scope/scope changes?
  - 3.3. Do you use formal procedures to manage changes?
  - 3.4. Do you have change control board or other form of standard change management procedure or structure?
4. Schedule management
  - 4.1. How do you define and manage schedule?
  - 4.2. Does your organization utilize some form of standard software for defining, tracking and controlling schedule?
5. Cost management
  - 5.1. Does your organization uses standard procedures and software to conduct cost estimates?
  - 5.2. Does your organization tracks costs against the base line and project performance? How often?
  - 5.3. Does your organization apply methods such as earned value against planned value? Cost at completion and other cost & benefit tracking methods?
6. Quality management
  - 6.1. Do you have standard quality management procedures and metrics?

7. Risk management

7.1. Does your organization have risk response plan?

7.2. Does the organization regularly update the risk register?

7.3. Does your organization assign risk owner for large & complex projects?

8. Resources and procurement management

8.1. Do you have a standard form for resources & procurement planning?

9. Stakeholders and Communication management

9.1. Is there a standard procedure to develop stakeholders and communication plan?

9.2. Do you prepare such plans for all projects?

**Appendix II: Research Clearance Letter**

**THE OPEN UNIVERSITY OF TANZANIA**  
**DIRECTORATE OF POSTGRADUATE STUDIES**

P.O. Box 23409  
 Dar es Salaam, Tanzania  
<http://www.openuniversity.ac.tz>



Tel: 255-22-2668992/2668445  
 Ext.2101  
 Fax: 255-22-2668759  
 E-mail: [dpgs@out.ac.tz](mailto:dpgs@out.ac.tz)

**Our Ref: PG201902274**

**TO WHOM IT MAY CONCERN**

15<sup>th</sup> February 2022

**RE: RESEARCH CLEARANCE**

The Open University of Tanzania was established by an Act of Parliament No. 17 of 1992, which became operational on the 1<sup>st</sup> March 1993 by public notice No.55 in the Official Gazette. The Act was however replaced by the Open University of Tanzania Charter of 2005, which became operational on 1<sup>st</sup> January 2007. In line with the Charter, the Open University of Tanzania's mission is to generate and apply knowledge through research.

To facilitate and to simplify the research process, therefore, the act empowers the Vice-Chancellor of the Open University of Tanzania to issue research clearance, on behalf of the Government of Tanzania and Tanzania Commission for Science and Technology, to both its staff and students who are researching in Tanzania. With this brief background, the purpose of this letter is to introduce to you Mr. Melakeselam Dimetros Gebrehanna, Reg No: PG201902274 pursuing a Master of Project Management (MPM). We hereby grant this clearance to conduct a research titled "*Assessment of Project Management Maturity: A Case of Ethiopian Construction Design and Supervision Works Corporation* ". He will collect his data in your area from 18th May 2019 to 30th August 2019.

In case you need any further information, kindly do not hesitate to contact the Deputy Vice-Chancellor (Academic) of the Open University of Tanzania, P.O. Box 23409, Dar es Salaam. Tel: 022-2-2668820. We lastly thank you in advance for your assumed cooperation and facilitation of this research academic activity.

Yours Sincerely,

Prof. Magreth Bushesha  
**DIRECTOR OF POSTGRADUATE STUDIES**  
**THE OPEN UNIVERSITY OF TANZANIA**