
# PROJECT MANAGEMENT PRACTICES OF ETHIOPIAN ELECTRIC POWER CORPORATION IN THE CASE OF UNIVERSAL ELECTRICITY ACCESS PROGRAM (UEAP)

**BY**

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# CERTIFICATE

This is to certify that the thesis entitle "PROJECT MANAGEMENT PRACTICES OF ETHIOPIAN ELECTRIC POWER CORPORATION IN THE CASE OF UNIVERSAL ELECTRICITY ACCESS PROGRAM", submitted to Addis Ababa University, School of Commerce to undertake a research in partial fulfillment of the requirements for the award of the degree of Master of Arts (MA), has been prepared by Mr. Gebregziabher Hailu Gebregiorgiss under my guidance and supervision.

Therefore, I hereby declare that no part of this thesis has been submitted to any other University or Institution for the award of any Degree or Diploma and all the matters embodied in the thesis have been duly acknowledged.

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# DECLARATION

**"**I declare that PROJECT MANAGEMENT PRACTICES OF ETHIOPIAN ELECTRIC POWER CORPORATION IN THE CASE OF UNIVERSAL ELECTRICITY ACCESS PROGRAM is my original work, that all the source I have used or quoted have been indicated and acknowledged as complete references, and that it has not been submitted for degree purposes previously"

| **Researcher Name** | **Date** | **Signature** |
|---|---|---|
| **Gebregziabher Hailu** | **June, 2019** | _____ |

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## ABSTRACT

*Since 2005/06, many rural electrification projects in Ethiopia have been undertaken under the administration of the Universal Electricity Access Program (UEAP) by involving local contractors on the projects. However, the program has not succeeded in meeting its electrification targets as projects were facing critical problems with respect to time and cost performance. There are several factors that are contributing to these time and cost performance problems among which project management problems originating from the project owner or administrator (UEAP) was the major one.*

*This research attempts to assess the project management (PM) practices of UEAP and identify the practice gaps in comparison to conventional as well as best PM practices; in order to clearly indicate the specific intervention areas as an input for the program's future project success.*

*The research was undertaken through an intensive literature review, a survey on the PM practices of the project administrator (UEAP) and a case study of one ongoing rural electric distribution project which was investigated with the aim of validating the survey findings. UEAP's PM practices were identified based on the opinions of its senior-management, project managers and technical experts involved in project management works. The survey was carried out through a questionnaire which contained questions on project management practices, techniques and tools revealed by the literature review. It contained 43 questions which were categorized into six groups. A total of 354 questionnaires from UEAP management and project staff were collected for analysis. The identified PM practices obtained from both the survey and the case investigation were descriptively analyzed.*

*Findings of the survey as well as the case investigation indicated that UEAP's PM practices are far from the standards and best practices. Its project management processes (often grouped into a project management methodology) are poorly-defined, the operating framework and hence the organizational structure is unstable, and people management skills which are fundamental to a high project management maturity level are poorly developed. Apart from this, PM systems and tools as well as capacity building of project staff which help to automate and support its project management processes are rarely purchased and created.*



**Key Words: Universal Electricity Access Program (UEAP), PM Practices, PM systems and tools**

## Table of Contents Page No.

## LIST OF TABLES



## LIST OF FIGURES

## ACRONYMS

| | |
|---|---|
| AfDB | African Development Bank |
| ANSI | American National Standards Institute |
| BADEA | Bank of Arab for Economic Development in Africa |
| EEP | Ethiopian Electric Power |
| EEPCO | Ethiopian Electric Power Corporation |
| EEU | Ethiopian Electric Utility |
| ETB | Ethiopian Birr |
| EVM | Earned Value Management |
| FDRE | Federal Democratic Republic of Ethiopia |
| IPD | Integrated Project Delivery |
| MoWIE | Ministry of Water, Irrigation and Electricity |
| PfM | Portfolio Management |
| PM | Project Management |
| PMBOK | Project Management Body of Knowledge |
| PMI | Project Management Institute |
| PPM | Project Production Management |
| PwC | PricewaterhouseCoopers International Limited |
| REF | Rural Electrification Fund |
| SNNP | Southern Nations Nationalities and Peoples Region of Ethiopia |
| UEAP | Universal Electricity Access Program |

# CHAPTER ONE – INTRODUCTION

## 1.1 Introduction

Project contract management practices are becoming a core competency critical to an organization's competitive advantage. Recent studies have shown that organizations with established and mature contract management process are able to generate millions of dollars in additional saving and have a distinct competitive advantage over their competitors. On the other hand, weak project contract management practices leads to higher cost overrun, high schedule variance, sources of distress, dispute, loss, and so on (Goodrich, 2013). A major portion of every organization's operating cost is spent on outside goods and services. Based on this fact, executive management everywhere is determining that Procurement and Contracts must emerge as a core competency of all those involved in the acquisition of equipment, materials, and services if organizations are to lower operating cost and improve productivity. On this regard, scholars recommend strictly to follow the three major phases of the contract life cycle: Pre-Contract, Contract Execution, and Post Award (Sriram et al., 2015). According to Goodrich (2013), project management (PM) is the process of managing contract creation, execution and analysis to maximize operational and financial performance at an organization, all while reducing financial risk. On top of that, the application of the body of knowledge concerned with principles, techniques, and tools used in planning, control, monitoring, and review of project is to ensure the achievement of the project objective (PMI, 2013).

This academic thesis tries to analyze the project management practices of the Universal Electric Access Program (UEAP) in Ethiopia under the Ethiopian Electric Utility (EEU). The Ethiopian Electric Utility was established in December, 2013 when the Ethiopian Electric Power Corporation (EEPCO) was split in two companies as Ethiopian Electric Utility (EEU) and Ethiopian Electric Power (EEP). The mission of the enterprise, as indicated in the Council of Minister Regulation No.303/2013, is to construct and maintain electric distribution networks, to purchase bulk electric power and sell electric energy to customers (FDRE, 2013). The case organization in this study is the Universal Electricity Access Program (UEAP) which was established in 2005 under the administration of the former Ethiopian Electric Power Corporation (EEPCO). In order to further validate the PM practices of the case company, an investigation of

one of the ongoing projects is also made. The case project is being handled by one private contractor which signed contractual agreement with UEAP.

### 1.2 Statement of the Problem

The Government of Ethiopia has embraced increasing electricity access as a pillar of its strategy for promoting income-generating activities and social services outside major urban centers in order to improve living standards and reduce poverty. Promoting access to electricity is also part of its strategy to decentralize the delivery of services throughout the country. Accordingly, the UEAP is designed to electrify most rural towns and villages over a ten-year horizon through extension of the grid. These rural towns/villages range in size from about 300 to 15,000 inhabitants. The initial objective of the UEAP is to electrify approximately 50% of rural towns over five years, with a long term view to connecting virtually all towns and villages to the grid in a ten-year horizon. Unlike this, however, many projects under the control of UEAP have suffered in delay, cost overrun and schedule variances.

A study conducted in 2015 showed that 28% of the delays are due to factors related to the employer, followed by 23% to factors associated to contractors. Delay in material supply and redesigning of plans (which the owner is supposed to avail to the contracting private contractors) accounted 17% and 12%, respectively (Meaza, 2017). In addition to this, the researcher conducted a preliminary investigation in to the project management practices of UEAP being applied on one of the ongoing projects handled by a private contractor (called KBC). The agreement for this live project was made on December 24, 2010. In the contractual agreement, both parties agreed on the "contract commencement and completion'' of the project and the contract commencement date was set as fifteen days after the contract signing date and the date for completion was agreed to be eight month from the contract commencement date. What triggered the writer and attracted his attention was that this contract agreement is active until now; it has been active for almost the past nine years while it was signed to be completed within eight months' period. From the above two facts, it can be concluded that UEAP projects are facing poor project management (PM) practices which needs further investigation.

This study tries to assess the PM practices on distribution line construction projects under UEAP administration which aimed at providing electricity to rural towns and villages throughout Ethiopia. The findings from the assessment and the expected PM practice recommendations can

help the project owner/administrator as well as other stakeholders to improve project deliveries, and hence meet electrification targets as planned.

## 1.3 Research Question

This study tries to address the following research question:-

- What are the PM practices UEAP failed to adopt in the three phases of project delivery – concept and design, contracting and procurement, and execution?

## 1.4 Objective of the Research

### *1.4.1 General Objective*

The general objective of the study is to assess the project management practices of UEAP and identify the gaps in comparison to conventional as well as best PM practices from the literature.

### *1.4.2 Specific Objectives*

The study has the following specific objectives

1. To assess the enterprise's PM practices followed towards the effective delivery of projects
2. To identify PM practice gaps and challenges faced by the enterprise which contribute towards project delay, cost overruns or scope changes
3. To identify the potential PM practices which shall be adopted by UAEP for successful delivery of projects at hand and in the future

## 1.5 Scope and Limitations of the Study

The scope of this study is limited to assess the project management practices of the case organization i.e. UEAP which is involved in the electric power distribution line construction projects in Ethiopia for more than ten years in the past. Because of time and budget constraints, the study focused only universal electric access project offices which has been launched across the country and the researcher assumes to survey the enterprise for which one of the active projects will be deeply assessed to support the survey on UEAP. Conceptually, it focused on construction project management practices of the company which align with conventional project management practices in the literature.

## 1.6 Significance of the Study

Electricity is one of the prominent inputs of socio-economic development of a country. However, electricity access in Ethiopia is still very low and the challenge is being further intensified with growing population and rapid urbanization in the country. The main objective of this study is to identify the challenges and issues contributing to low level of electricity access in the country regarding the project contract management practices under UEAP. Therefore, the study is important in assessing the PM practices of UEAP and in identifying the practice gaps that hinder the successful completion of projects. Even though this study is carried out with a limited scope, it could be helpful to have an insight on the complexity of the challenges and issues on contract management in the electricity access program. Moreover, it can contribute as inputs for further research in this area and used as reference for the academia, professional and researcher and those who are interested in the area of contract administration and project management practices.

## 1.7 Organization and Contents of the Research

The study is organized into five chapters. Chapter one provides a brief background to the study, discusses statement of the problem, the research question, objective of the study, scope and limitation and significance of the study. Chapter two presents review of related literature followed by Chapter three which presents the research methodology in which the research methods, data collection, the sources of data and the methods of data analysis. The fourth chapter focuses on the presentation, analysis and interpretation of the research findings. Finally, chapter five provides recommendations of the study.

# CHAPTER TWO – LITERATURE REVIEW

## 2.1 Theoretical Literature

### *2.1.1 Definitions and Standards for Project and Project Management*

In order to understand project management, one must begin with the definition of a project. According to Harold (2009), a project can be considered to be any series of activities and tasks that:

- Have a specific objective to be completed within certain specifications
- Have defined start and end dates
- Have funding limits (if applicable)
- Consume human and nonhuman resources (i.e., money, people, equipment)
- Are multifunctional (i.e., cut across several functional lines)

Project management on the other hand involves five process groups of project initiation, planning, executing, monitoring & evaluation and project closing. The current edition of the Project Management Book of Knowledge (PMBOK 5th edition), issued by the Project Management Institute (PMI) states that project management is the application of knowledge, skills, tools, and techniques to project activities to meet the project requirements. It further explains project management is accomplished through the appropriate application and integration of the 47 logically grouped project management processes, which are categorized into five Process Groups. These five Process Groups are:

- Initiating,
- Planning,
- Executing,
- Monitoring and Controlling, and
- Closing.

In practice, managing a project typically includes, but is not limited to:

- Identifying requirements;

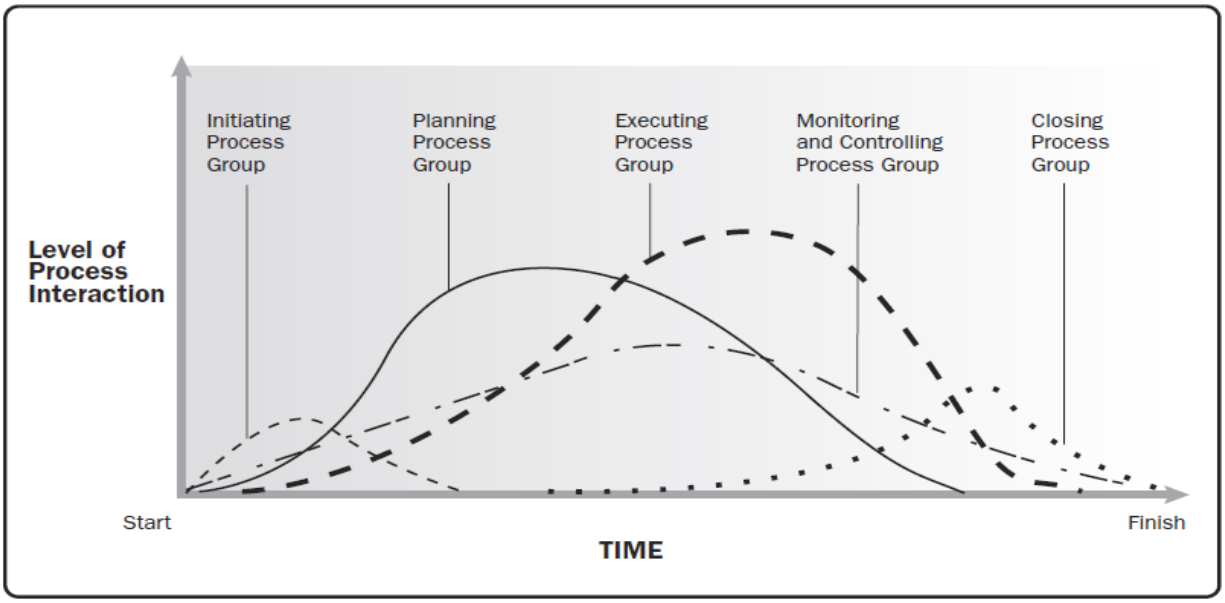
- Addressing the various needs, concerns, and expectations of the stakeholders in planning and executing the project;
- Setting up, maintaining, and carrying out communications among stakeholders that are active, effective, and collaborative in nature;
- Managing stakeholders towards meeting project requirements and creating project deliverables;
- Balancing the competing project constraints, which include, but are not limited to:
    - Scope,
    - Quality,
    - Schedule,
    - Budget,
    - Resources, and
    - Risks.

The specific project circumstances will influence the constraints on which the project manager needs to focus and require effective application and management of appropriate project management processes (PMBOK, 2013).

### *2.1.2 Project Management Standards*

According to Ram et al. (2016), professionals in the project management field agree that conventional project management is codified by the Project Management Institute (PMI). Hence, PMI has developed the standards for project management of a project. In October 1998, PMI was accredited as a standards developer by the American National Standards Institute (ANSI) which provided the processes outlined above and are described in the PMBOK® Guide – Fifth Edition (Ram et al., 2016). As per the standard, Project Management Process Groups are linked by the outputs they produce. The Process Groups are seldom either discrete or one-time events; they are overlapping activities that occur throughout the project. As indicated in figure 1 below, the output of one process generally becomes an input to another process or is a deliverable of the project, subproject, or project phase (PMBOK, 2013).

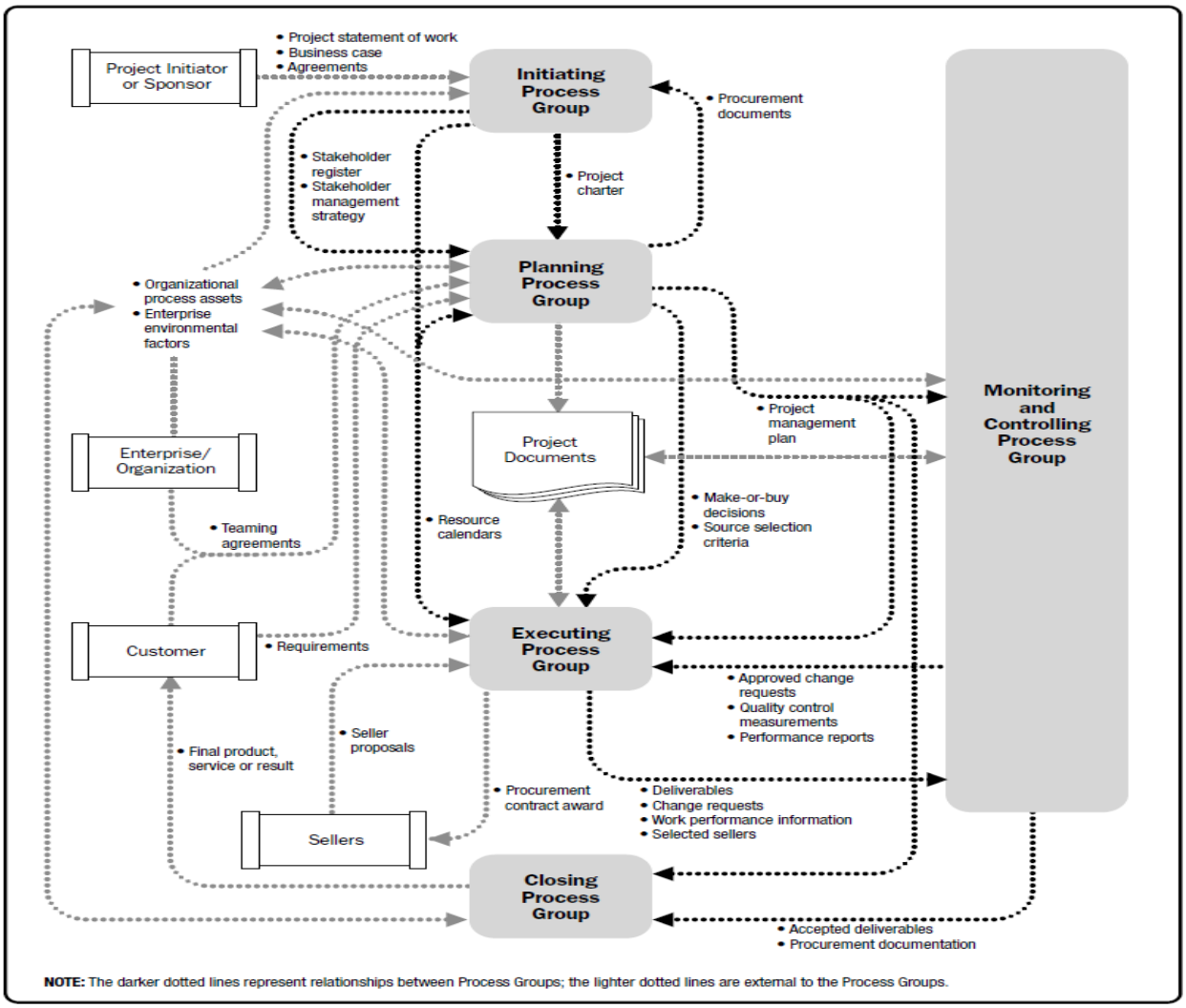
**Figure 1 Process Group Interactions in a Project**




*Source: Project Management Book of Knowledge (5th edition), issued by PMI, 2013*

These five Process Groups have clear dependencies and are typically performed in each project and highly interact with one another. These five Process Groups are independent of application areas or industry focus. Individual Process Groups and individual processes are often iterated prior to completing the project and can have interactions within a Process Group and among Process Groups. The nature of these interactions varies from project to project and may or may not be performed in a particular order. The process flow diagram, Figure 2, provides an overall summary of the basic flow and interactions among Process Groups and specific stakeholders. The project management processes are linked by inputs and outputs where the result or outcome of one process becomes the input to another process but not necessarily in the same Process Group. The Process Groups are not project phases. In fact, it is possible that all Process Groups could be conducted within a phase. As projects are separated into distinct phases or subcomponents, such as concept development, feasibility study, design, prototype, build, or test, etc., all of the Process Groups would normally be repeated for each phase or subcomponent along the lines explained above and illustrated in Figure 3 (PMBOK, 2013).

**Figure 2 Project Management Process Interactions**




Source: *Source: Project Management Book of Knowledge (5th edition), issued by PMI, 2013*

Figure 3 reflects the mapping of the 47 project management processes into the 5 Project Management Process Groups and the 10 Project Management Knowledge Areas. The project management processes are shown in the Process Group in which most of the activity takes place. For example, when a process that normally takes place in the Planning Process Group is updated in the Executing Process Group, it is not considered a new process. The iterative nature of project management means that processes from any group may be used throughout the project life cycle. For example, executing a risk response may trigger the Perform Quantitative Risk Analysis process to evaluate the impact (PMBOK, 2013).

**Figure 3: Project Management Process Group and Knowledge Area Mapping**

| Knowledge Areas | Project Management Process Groups | | | | |
|---|---|---|---|---|---|
| | Initiating Process Group | Planning Process Group | Executing Process Group | Monitoring and Controlling Process Group | Closing Process Group |
| 4. Project Integration Management | 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<br>4.5 Perform Integrated Change Control | 4.6 Close Project or Phase |
| 5. Project Scope Management | | 5.1 Plan Scope Management<br>5.2 Collect Requirements<br>5.3 Define Scope<br>5.4 Create WBS | | 5.5 Validate Scope<br>5.6 Control Scope | |
| 6. Project Time Management | | 6.1 Plan Schedule Management<br>6.2 Define Activities<br>6.3 Sequence Activities<br>6.4 Estimate Activity Resources<br>6.5 Estimate Activity Durations<br>6.6 Develop Schedule | | 6.7 Control Schedule | |
| 7. Project Cost Management | | 7.1 Plan Cost Management<br>7.2 Estimate Costs<br>7.3 Determine Budget | | 7.4 Control Costs | |
| 8. Project Quality Management | | 8.1 Plan Quality Management | 8.2 Perform Quality Assurance | 8.3 Control Quality | |
| 9. Project Human Resource Management | | 9.1 Plan Human Resource Management | 9.2 Acquire Project Team<br>9.3 Develop Project Team<br>9.4 Manage Project Team | | |
| 10. Project Communications Management | | 10.1 Plan Communications Management | 10.2 Manage Communications | 10.3 Control Communications | |
| 11. Project Risk Management | | 11.1 Plan Risk Management<br>11.2 Identify Risks<br>11.3 Perform Qualitative Risk Analysis<br>11.4 Perform Quantitative Risk Analysis<br>11.5 Plan Risk Responses | | 11.6 Control Risks | |
| 12. Project Procurement Management | | 12.1 Plan Procurement Management | 12.2 Conduct Procurements | 12.3 Control Procurements | 12.4 Close Procurements |
| 13. Project Stakeholder Management | 13.1 Identify Stakeholders | 13.2 Plan Stakeholder Management | 13.3 Manage Stakeholder Engagement | 13.4 Control Stakeholder Engagement | |

*Source: Adopted from PMBOK 5th Edition, PMI 2013*

### *2.1.3 Project Life Cycle*

A project life cycle is the series of phases that a project passes through from its initiation to its closure. The phases are generally sequential, and their names and numbers are determined by the management and control needs of the organization or organizations involved in the project, the nature of the project itself, and its area of application. The phases can be broken down by functional or partial objectives, intermediate results or deliverables, specific milestones within the overall scope of work, or financial availability. Phases are generally time bounded, with a start and ending or control point. A life cycle can be documented within a methodology. The project life cycle can be determined or shaped by the unique aspects of the organization, industry, or technology employed. While every project has a definite start and a definite end, the specific deliverables and activities that take place in between will vary widely with the project. The life cycle provides the basic framework for managing the project, regardless of the specific work involved (PMI, 2013).

### *2.1.4 Project Delivery Phases*

Again as per the conventions set by the PMI, a project may be divided into any number of phases. A project phase is a collection of logically related project activities that culminates in the completion of one or more deliverables. Project phases are used when the nature of the work to be performed is unique to a portion of the project, and are typically linked to the development of a specific major deliverable. A phase may emphasize processes from a particular Project Management Process Group, but it is likely that most or all processes will be executed in some form in each phase. Project phases typically are completed sequentially, but can overlap in some project situations. Different phases typically have a different duration or effort. The high-level nature of project phases makes them an element of the project life cycle.

The phase structure allows the project to be segmented into logical subsets for ease of management, planning, and control. The number of phases, the need for phases, and the degree of control applied depend on the size, complexity, and potential impact of the project. Regardless of the number of phases comprising a project, all phases have similar characteristics:

- The work has a distinct focus that differs from any other phase. This often involves different organizations, locations, and skill sets.
- Achieving the primary deliverable or objective of the phase requires controls or processes unique to the phase or its activities. The repetition of processes across all five Process Groups, as described above, provides an additional degree of control and defines the boundaries of the phase.
- The closure of a phase ends with some form of transfer or hand-off of the work product produced as the phase deliverable. This phase end represents a natural point to reassess the

activities underway and to change or terminate the project if necessary. This point may be referred to as a stage gate, milestone, phase review, phase gate or kill point. In many cases, the closure of a phase is required to be approved in some form before it can be considered closed (PMI, 2013).

## 2.2 Empirical Literature - Best Project Management Practices & Tools

To be competitive in today's world, in any industry, organizations are dealing with unprecedented change driven by factors such as the pace of change, the shifts in global economic power, generational changes, the digital economy and the emergence of global players disrupting traditional sectors. Speed, quality, prioritization, discipline and adaptability are all key qualities that will engage customers and other stakeholders to use products or services and build lasting relationships (PwC, 2018).

In the backdrop of these changes, traditional project management methodologies are often no longer considered effective in being responsive to a customer's changing needs. To succeed in an environment with shifting demands, a business needs to be adaptive and agile – even more considering the changing environment we are working in and which has increased the risk of projects not producing expected benefits, teams failing to deliver on time, within budget or to expected quality standards, or outcomes not meeting stakeholder objectives.

In 2007, PwC invited senior executives and practitioners to participate in their first Global project management survey. The survey's main objective was to identify current trends in PM, and pinpoint the characteristics of PM that are applied on higher-performing projects. Accordingly, the key PM practices from their survey were the following (PwC, 2007);

- ***Many of the project failures are due to an imbalanced organization***

  *This means that Top and senior management frequently blame project managers for bad project management and poor project results. And yet, we can see from the survey, in which all levels of management were fairly equally represented, that many of the reasons for project failure are organizationally related and are outside the direct range of influence of project managers.*

- ***Organizational structure has a big influence in overall project performance***

*Organizational structure influences the performance and outcome of projects. The higher the alignment between structure and business requirements, the higher the overall project performance of the organization. Finding the right balance is not a simple task, especially for those companies operating in highly dynamic and competitive sectors.*

- ***Industry, location and business objectives are key to determining the optimal organizational structure***

  *The optimal organizational structure is determined by the business objectives of an organisation and influenced by the industry and the geographical region in which it operates.*

- ***Investing in staff development increases project performance***

  *Having a staff development programme has a positive effect on the overall performance of the organisation. The current situation does not look very promising, however, as more than 60% of the companies do not regularly offer a development programme to their staff.*

- ***Project management certification of staff pays off***

  *Certification does actually matter. Organisations should not be afraid of investing in their people via certification. The benefits organisations can receive from this are significantly higher than the risks they take.*

- ***Organizations that apply change management outperform the rest***

  *The survey reveals an undeniable correlation between project performance, maturity level and change management. The majority of the best performing and most mature organizations always or frequently apply change management to their projects.*

- ***External resources add value when employed in smaller scales***

  *External resources used, if employed with moderation, will add value and increase the performance of your project activities. In addition, the proportion of external resources employed varies depending on the organization's maturity level.*

- ***Implementing project management software successfully is significantly influenced by the organization's maturity level***

*Specialised project management software can create or destroy value, depending on when you decide to buy and implement it. We observed that the lower the maturity level, the more difficulties an organisation will have to implement the software.*

After four years, in 2012, PwC conducted its third survey to identify leading PM practices and trends, and to determine the correlation between PM, business performance, and organizational success. The focus of this third survey (which included three surveys with in) was to continue analyzing the use and impact of PM activities in successful organizations. One among the three parallel surveys has focused on the management of a specific project and included the following areas: Project Background, Factors Impacting Project Success, Governance, Scope Management, Risk Management, Benefits Realization Management, Human Resource Management, Cost Management, Quality Management, and Change Control Management (PwC, 2012). From December 2011 through January 2012, 1,524 participants (majority of which were Project Managers, Programme Managers, or Executive Managers) responded to their survey from 34 industries, across 38 countries. The data was gathered via a web-based quantitative survey, which consisted of 146 close-end questions. The survey indicated insights into the collective opinions of these groups of people on a wide range of topics (project types, success factors, tools, and people aspects) and 'best practices' (organizational structure, maturity level, and project performance). The findings in four key areas are summarized as in the following (PwC, 2012);

**Table 1: Process Based Best PM Practices**

| ***Area of Evaluation*** | ***Best Project Management Practices*** |
|---|---|
| ***Process*** | Standardization and institutionalization of PM processes; prioritization of projects and application of a standard project life cycle; utilization of project portfolio techniques; utilization of PM methodologies; and leveraging communication management best practices. |
| ***Organizational Structure*** | Resource ownership, definition of roles and responsibilities; support and involvement of senior and top management; and usage of a PMO. |
| ***People*** | Project staff skills and experience; development and training programme; and an emphasis on PM certification |
| Systems and tools | The use and benefits of leveraging software (PM, PfM, and Agile); and the Use and benefit of earned EVM. |

Source: Adopted from PwC, 2012

Bent et al. (2014) argued that psychological biases and misplaced incentives often lead to inaccurate forecasts of project costs and completion times. Based on their experience, managers who are aware of the problem can help address it by using outside-view forecasts and structuring incentives in a way that keeps everyone focused on company-wide goals (Bent et al, 2014).

Unlike this, Nicklas et al (2015) argue that building big infrastructure projects is always risky, but there are ways to improve the odds of a smooth landing. Initially they pointed out three reasons for project failure i.e. *Overoptimism and overcomplexity, Poor execution and Weakness in organizational design and capabilities.* The proceeded with the argument that improving project performance requires better planning and preparation in three areas namely: *Do the engineering and risk analysis before starting construction, Streamline permitting and land acquisition and Build a project team with the right mix of abilities* (Nicklas et al, 2015).

Considering Poor organization, Inadequate communication, Flawed performance management, Contractual misunderstandings, Missed connections, Poor short-term planning, Insufficient risk management, and Limited talent management as factors which account for poor productivity and cost outcomes, Sriram et al (2015) recommended 15 best practices that can help to improve productivity in the three phases of project delivery—concept and design, contracting and procurement, and execution. Their recommendation was based on analysis of more than $1 trillion worth of capital projects over the past five years which led them to the finding that improving "basic" project-management skills offers the most potential to improving site performance. The 15 recommended practices are (Sriram et al, 2015);

- **Under concept and design phase** - Build only what is needed, Maintain a life-cycle perspective, Strengthen scenario planning, Optimize around site constraints, Think modular design and standardization, Consult construction and procurement teams beginning in the design phase, and Optimize engineering processes and choices.
- **Under Contracting and procurement** - Integrate risk allocation into the contract, Set up an efficient process for claims and change-order management, Align the interests of owners and contractors, and Develop the owner's perspective on costs.

- **Under Project Execution phase** - Overinvest in planning, Use prefabrication and preassembly methods, Build structures to cooperate on project performance, and Minimize waste

Relatively recent studies argue that conventional project management practices as outlined by the PMI have two fundamental gaps preventing the satisfactory management and execution of today's complex and dynamic capital projects (Ram et al, 2016). Understanding these gaps explains why some traditional responses to recover from cost and schedule overruns in projects do not work. They proposed that Project Production Management (PPM) provides the two missing elements of conventional project management (Ram et al, 2016).

Similarly, Jim et al (2017) argue that major capital projects are habitually beset by overruns and delays, but three solutions offer a path out of entrenched dysfunction and to increased profitability. The three solutions are relational contracting, creative use of insurance, and project production management system. They concluded that these solutions provide a route toward a new environment in which owners and construction businesses are willing to and financially capable of investing in innovative ideas that stop the insanity and transform major project delivery (Jim et al, 2017). This idea was further strengthened by Lukasz et al (2018). They argued full implementation of integrated project delivery (IPD) or other forms of alliance contracting isn't for everyone. But everyone can and should implement collaborative contracting practices today to improve project outcomes. From their experience and based on four principles of incentives for collaboration, they proposed the following practices that project owners can initiate to spur a more collaborative approach (Lukasz et al, 2018). These are;

- Get contractor input early
- Co-create the scope and schedule
- Choose the right contractors
- Design win-win incentives
- Define processes that help capture value

For Lukasz et al (2018), the four key principles on which the incentives to collaborate are based on are:

- Everyone involved in a project—from the owner to the primary contractor to the subcontractors— should work to articulate a common vision, which involves agreement on target cost and schedule and defining what constitutes success for the project and for the individual companies involved.
- Contractors must have the expertise to steer a project toward efficient delivery and positive outcomes; owners must use this expertise to help encourage specific behaviors that lead to better project outcomes. This takes the form of early contractor involvement in site selection, design constructability reviews, locking a scope at the appropriate time, and long-lead procurement support.
- Contractors must be allowed to earn a reasonable return on the work, and both risk and reward should be shared.
- Performance management and production planning must be done collaboratively and at a systemic level.

## CHAPTER THREE – METHODOLOGY

### 3.1 Research Approach and Design

This research used a qualitative research approach which is suitable to study complex research problems that cannot be explored in isolation from their human and social context (Creswell, 2013). It is the preferred method for an in-depth exploration of a complex phenomenon such as PM practices where the boundaries between the phenomenon and its context are not always clear (Yin, 2014).

Case study is a commonly used research method in qualitative research approaches (Stake, 1995) as it facilitates the investigation of a contemporary phenomenon (e.g. a programme, an event, individuals, actions) within its social context, in its natural setting (Eisenhardt, 1989; Yin, 2014). It employs multiple methods of data collection to gather information from one or a few entities like people, group, or organizations (Benbasat et al, 1987, p.370). Single or multiple case studies can be used depending on the requirements of the research problem (Stake, 1995; Yin, 2014).
A single case study is suitable for a revelatory/extreme/unique case (Eisenhardt & Graebner, 2007; Yin, 2014) and is appropriate in the situation where very little theoretical insight is available into the phenomenon under study (Dyer & Wilkins, 1991). In contrast, a multiple case study approach supports the comparison between different cases for theory building, testing and generalization (Eisenhardt, 1989).

This study used the single case study approach and collected survey data from one public enterprise (UEAP). One of the most delayed projects administered by UEAP was also investigated with the aim of validating the survey findings conducted on the enterprise. Thus, the findings may also be applicable to other projects currently administered by the enterprise or other public institutions in Ethiopia which manage various construction projects.

### 3.2 Sources of Data and Research Instruments

The researcher used both primary and secondary data sources. The primary data were collected through structured questionnaire and interview. The structured questionnaire was developed in order to capture the PM practices of the case company based on opinions of senior management, project managers, project supervisors and technical experts. While developing the questionnaire

sufficient reference was made to empirical researches in the literature for benchmarking. The questionnaire survey method is adopted because it is usually cheap, easy to administer to a large number of respondents, and normally gets more consistent and reliable results. Apart from this, interviews were conducted with concerned management bodies of the employer, various government organs and a few contractors in order to gather additional primary data.

The secondary data were collected from policy documents, internal procedures, annual reports, newspapers and magazines of the enterprise that were related to the study.

### 3.3 Target Population

UEAP has 550 internal permanent staff which handles distribution projects dispersed regionally. Out of the total staff size, 84% of the staff is in the position of technical expert and above, having direct involvement in construction projects of the enterprise. The remaining 16% are support staff largely dominated by low positioned non-clerical staff involved in works not directly related to project works of the enterprise like janitorial services. Accordingly, the study considered the whole staff of the case enterprise (with positions related to electric distribution construction works) as a target population for the study. That is, all of UEAP's 84% staff in the position of technical expert and above was considered for the survey for which the structured questionnaire was designed, distributed and filled by these respondents to collect the primary data.

### 3.4 Data Analysis

Because of the exploratory nature of the research, we used an interpretive approach in order to clarify and understand the case and capture the ‘‘world views’’ of the subjects as well as the issues at play within a specific project's context (Walsham, 2006).

More specifically, analysis of qualitative data followed the following procedures recommended by Cress well (2003),

1. The data were read a number of times to identify points that are significant for the study
2. Thematic contents were formulated based on the major research questions

3. Emerging theme titles were listed out on a separate sheet in to find connection between them.
4. A master list of themes was produced and ordered coherently
5. Sub-themes, which go with each master theme, were identified
6. The relevant information was organized under each theme and analyzed.

Then quantitative data were analyzed using advanced excel and presented in the form of figures, graphs, bar and pie charts etc. Analysis and interpretation of data results was conducted using percentage comparisons, calculation of averages, frequencies and related mathematical matrices.

### 3.5 Ethical issues

In doing any research, there is an ethical responsibility to do the work honestly and with integrity. The basic principle of ethical research is to preserve and protect the human dignity and rights of all subjects involved in a research project (Leedy and Ormrod, 2010). In this regard, the researcher assured that the respondents' information is confidential and used only for the study purpose. The researcher also committed to report the research findings in a complete and honest manner, without confusing others about the nature of the results. As a general rule, therefore, the study did not raise any ethical anxiety. Moreover, the researcher was dreadfully careful about professional theft (plagiarism).

## CHAPTER FOUR – ANALYSIS AND DISCUSSION OF RESULTS

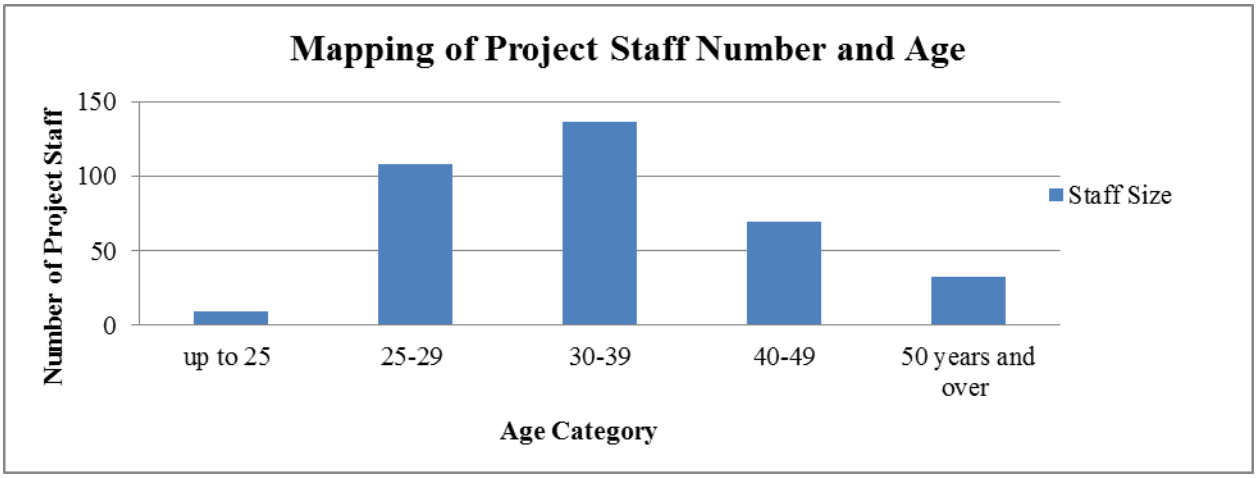
### 4.1 Questionnaire Distribution and Response Statistics

A total of 460 questionnaires were distributed among the respondents of program/project directors, project managers, supervisors and expert level regional staff working on UEAP distribution construction projects. Out of the 460 questionnaires distributed, 354 (77%) were returned indicating a significant size of response rate.

### 4.2 Respondents' Age, Gender, and Educational Qualifications

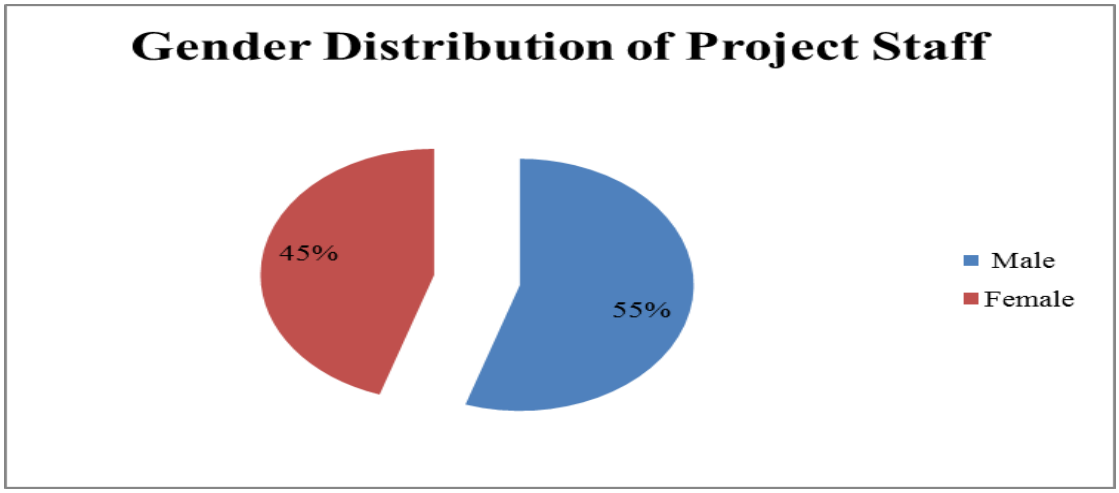
As indicated in the figure below, majority of the respondents are in the active working age range i.e. 25-49 which is an ideal age for challenging projects like electric distribution construction works.

**Figure 4 Respondents' Age Mapping**




Regaring the gender distribution, majority of the repondents are male, though the size of female project works are significant enough i.e. 45% share of the total size as indicated in figure 5.

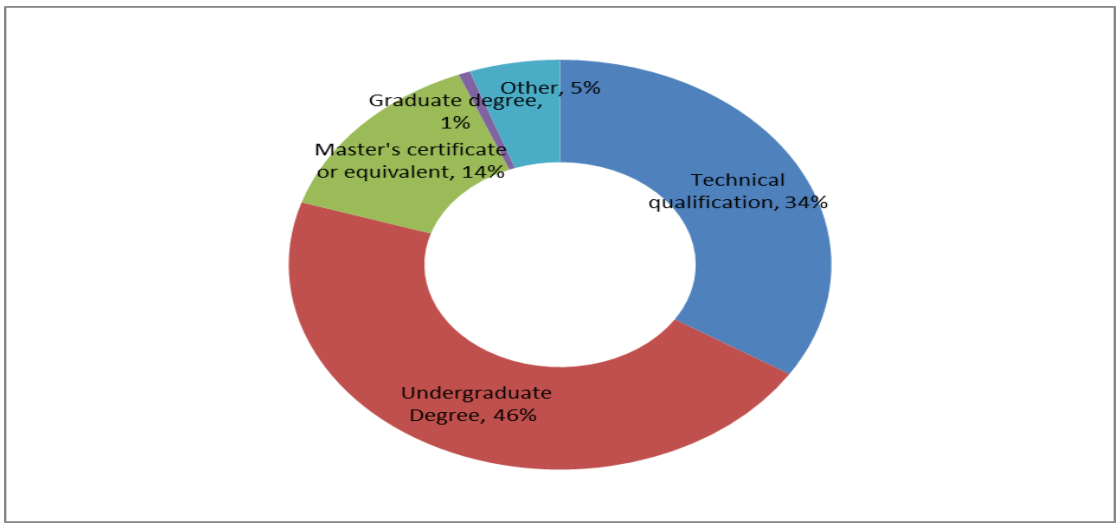
**Figure 5 Respondents' Gender**




### 4.3 Respondents Academic Background, Primary Role and Experience

As indicated in figure 6, 46% of the respondents are qualified in undergraduate degree, while 34% have technical qualifications and 14% are master's degree holders. Only 1% of the respondents are graduate degree holders.

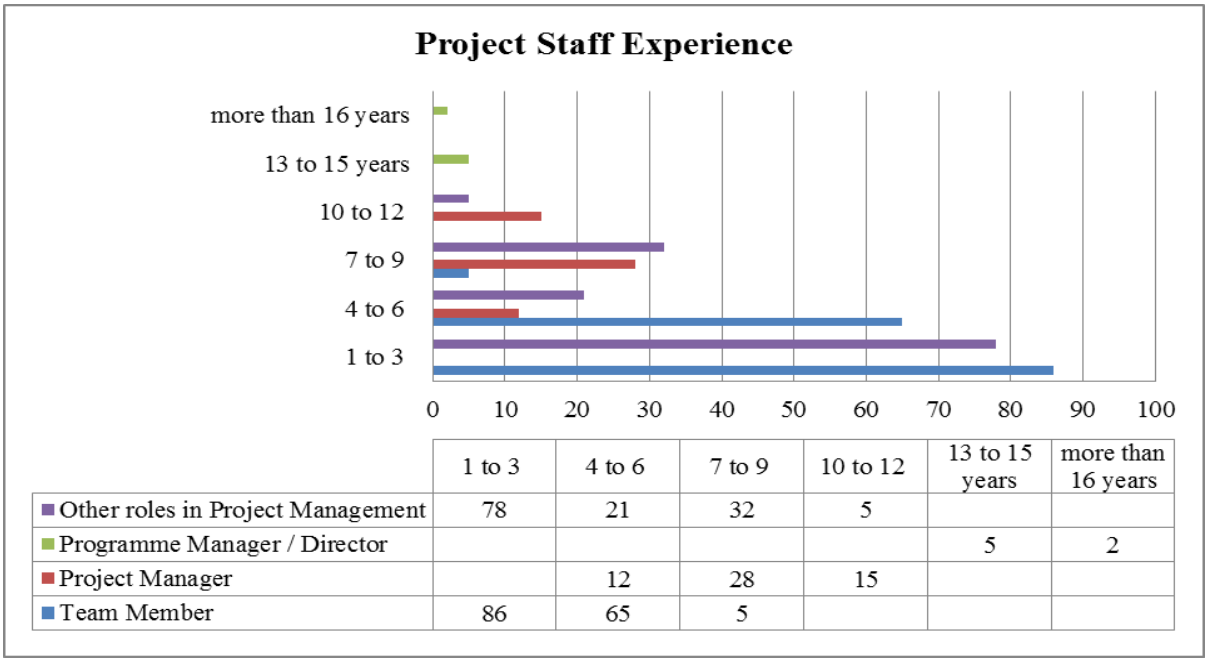
**Figure 6 Respondents Academic background**




Regarding specific roles and years of experience, majority of the respondents are team members of a project team or they are engaged in other project management roles, 86 and 78 respectively.

These job categories are held by individuals with work experience in the range of 1 to 3 and 4 to 6 years of experience. Most of the respondents having senor managerial roles have richer work experiences in the range of 7 to 9 and 10 to 12 years of experience (refer figure 7 below).

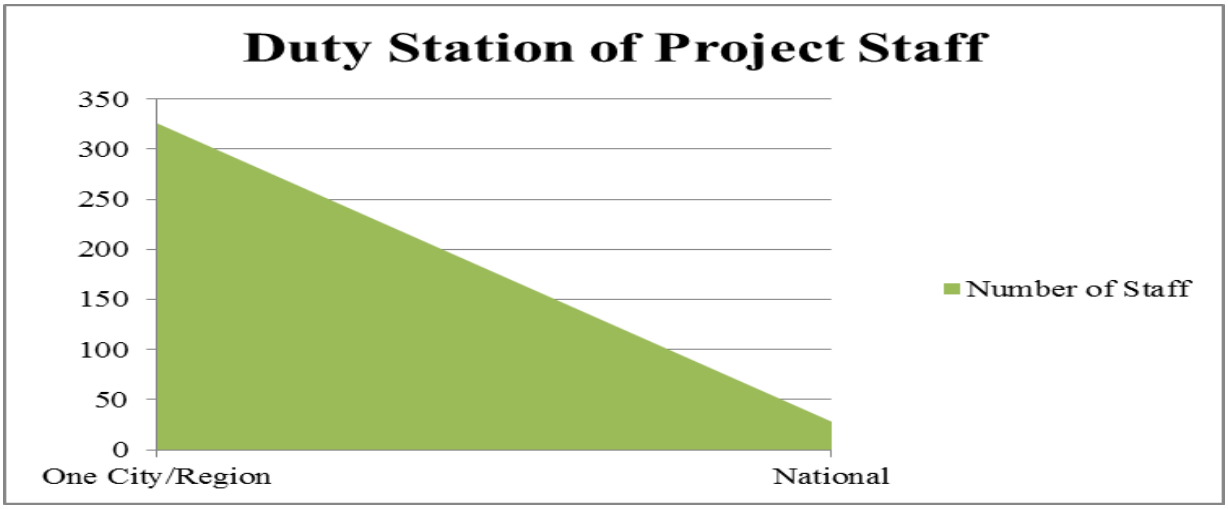
**Figure 7: Respondents' Role and Wrok Experience**




| | 1 to 3 | 4 to 6 | 7 to 9 | 10 to 12 | 13 to 15 years | more than 16 years |
|---|---|---|---|---|---|---|
| Other roles in Project Management | 78 | 21 | 32 | 5 | | |
| Programme Manager / Director | | | | | 5 | 2 |
| Project Manager | | 12 | 28 | 15 | | |
| Team Member | 86 | 65 | 5 | | | |

In terms of duty locations, the lion share of the respondents (more than 300) are located in the regions or towns while the balancing share are locate centerally in the head quarter, Addis Ababa having a national coordinating role.

**Figure 8 Respondents' Duty Station**



## 4.4 Analysis of Results

### *4.4.1 Findings on Major Project Management Practices*

In this section, analysis of project management practices based on the opinion of respondents to various project management questions is presented.

Respondents were asked to choose the level of project maturity that best describes the level of maturity of the project management systems in their operational areas in projects owned by UEAP. Accordingly, 89% of the respondents responded that their project management system in their operational area is at an initial level. This means that the PM practice is ad hoc and chaotic which relies on the competence of individuals not the organization's. 10% of the respondents replied that it is at the repeatable Level i.e. there is a project management system and plans are based on previous experience. As indicated in figure 9 below, only 1% of the respondents replied that their project management practice is at the defined Level meaning common, organization wide understanding of project management activities, roles and responsibilities are available. Hence, there are no respondents whose PM practice is in the categories of managed and optimizing levels.

**Figure 9: Project Management system in project operation areas of UEAP**

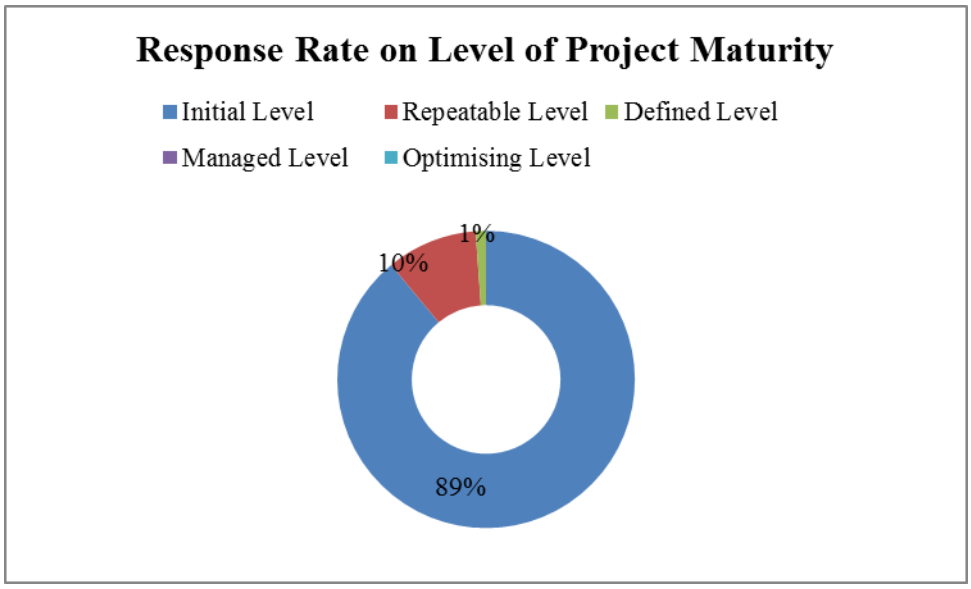
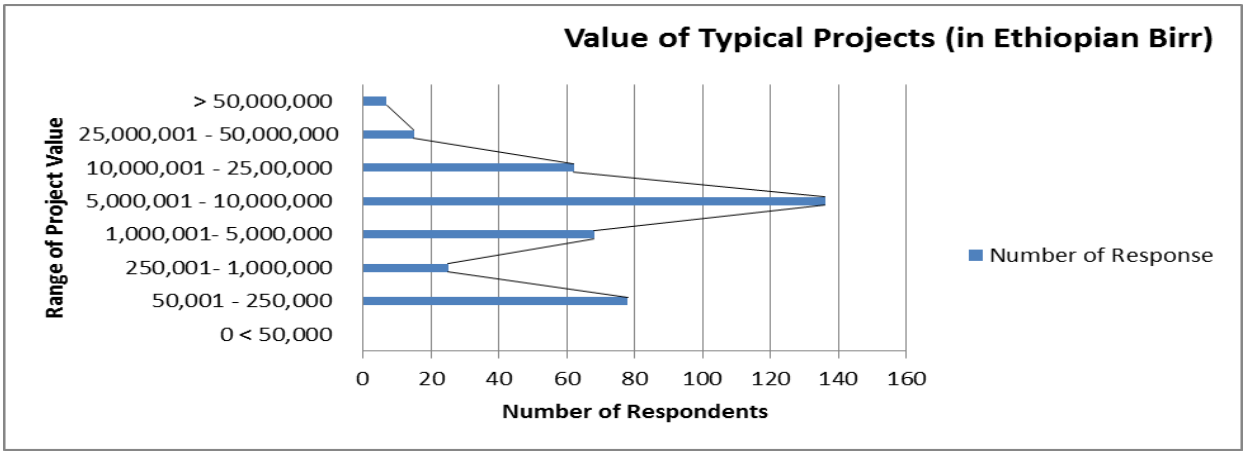


**Figure 10: Typical Project Size at UEAP**

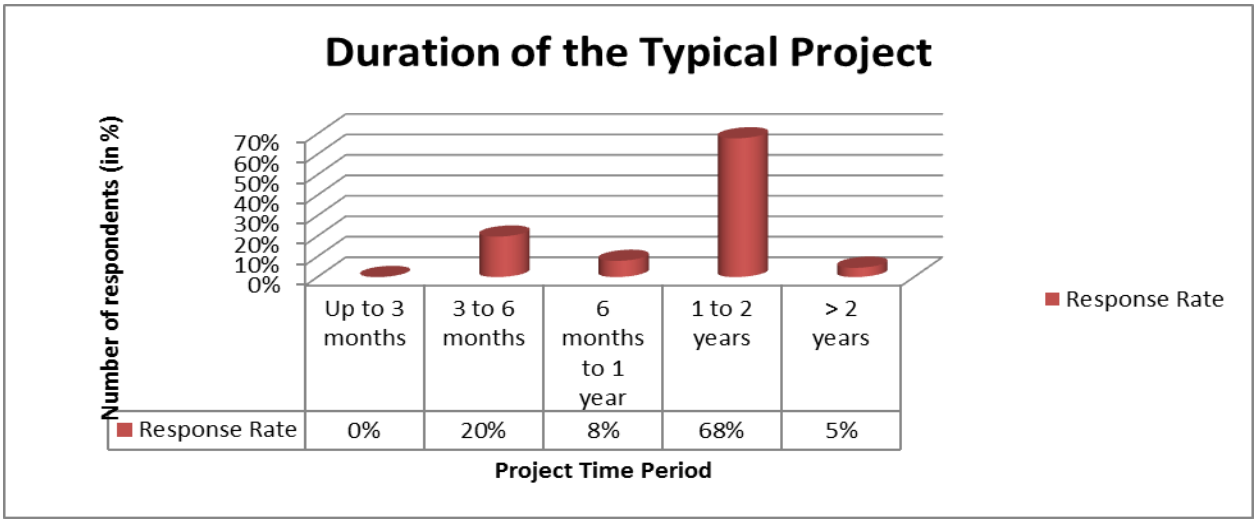



Source: Researcher's Own Calculation of Survey Data, 2019

Repondents were also asked to indicate typical value (in Ethiopian Birr, ETB) of the projects they work on or manage in their primary role at UEAP. More than 130 of the repondents indicated that they are engaged in projects worth between ETB %million and 10Million followed by projects in the range of 50,000 to 250,000 which are projects assigned to regional offices for their management right from the beginning (figure 10).

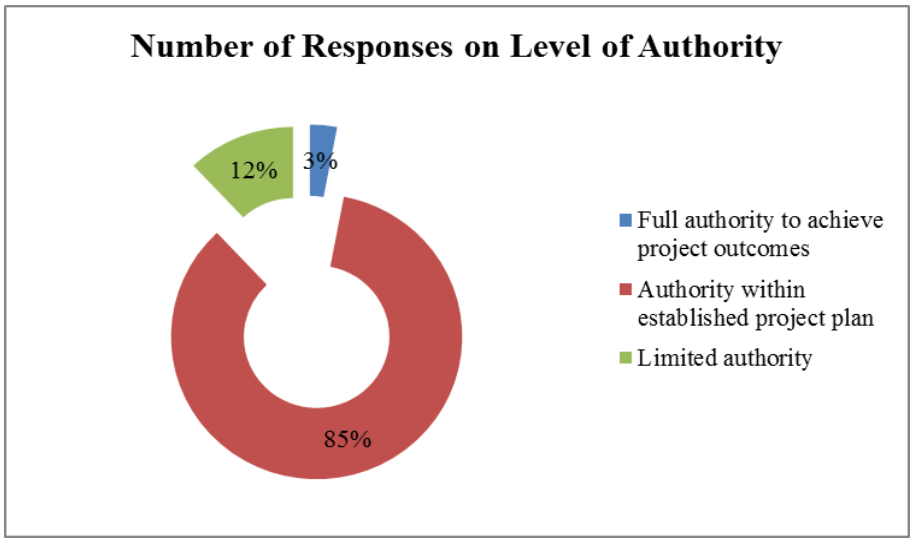
In response to the question regarding the typical duration for a project (figure 11) at UEAP, 68% of the respondents replied it is in the range of 1 to 2 years followed by 20% in the range of 3 to 6 months.

**Figure 11: Duration of a Typical Project at UEAP**



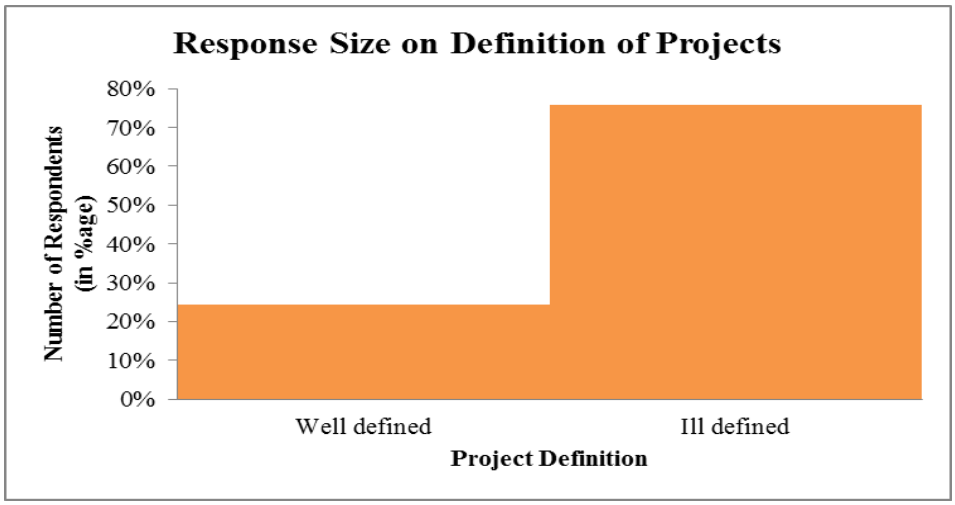
Responses regarding the level of authority, 85% responded that their authority is with in the established project plan, while 12% have limited authority ad the remaining 3% of the respondents answered that they have full authority to achive project outcomes (figure 12).

**Figure 12: Level of Authority at UEAP Projects**



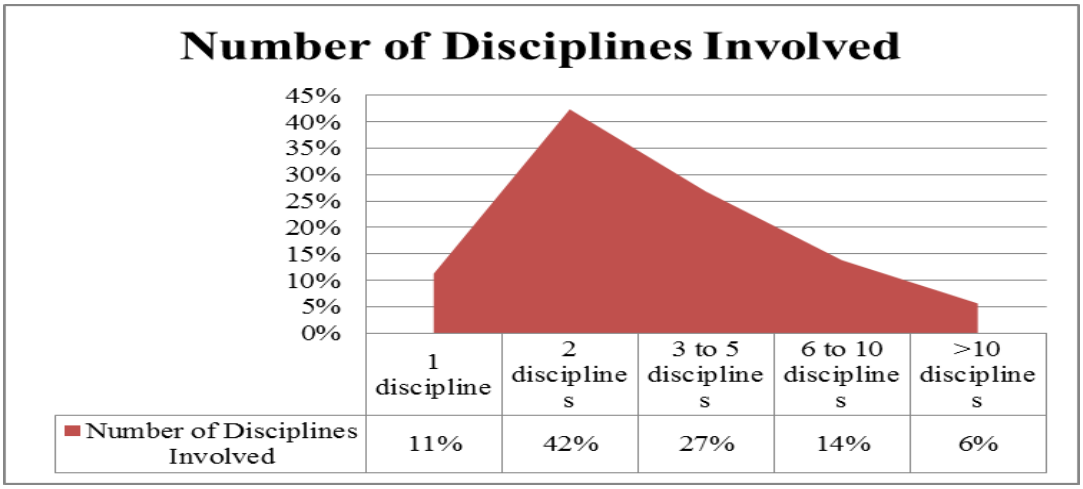

Regarding project definition, 76% repondents answered that projects were ill definied at the point where they joined and the remianing 24% answered that projects were well defined at they point where they joined it (figure 13).

**Figure 13: Definition of Projects at UEAP**



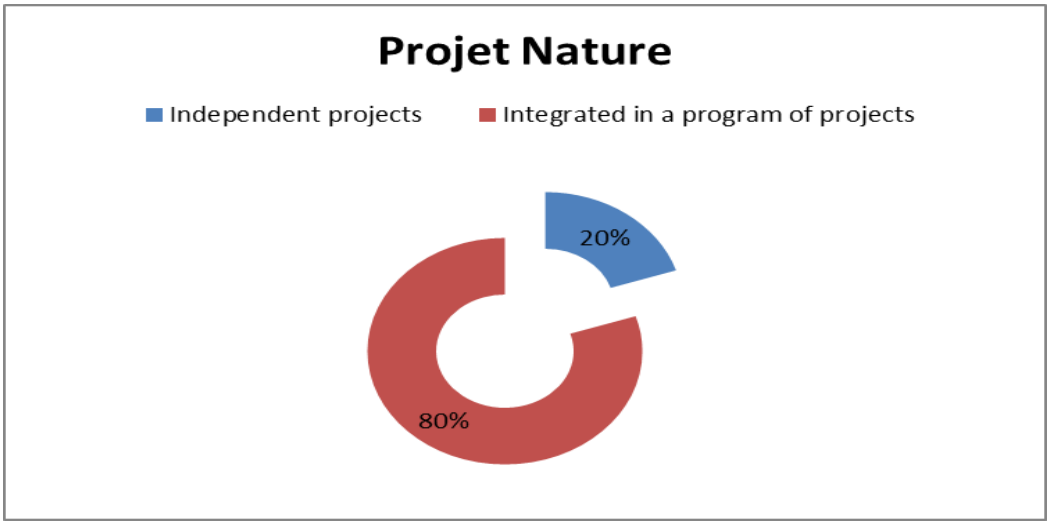
When respondents were asked as to the number of disciplines involved in their repective projects, majority of them(42%) answered that two disciplines are involved while 27% said 3 to 5 disciplines are involved follwed by 14% respondents who answered that 6 to 10 disciplines are involved (figure 14).

**Figure 14: Number of disciplines involved at UEAP Projects**



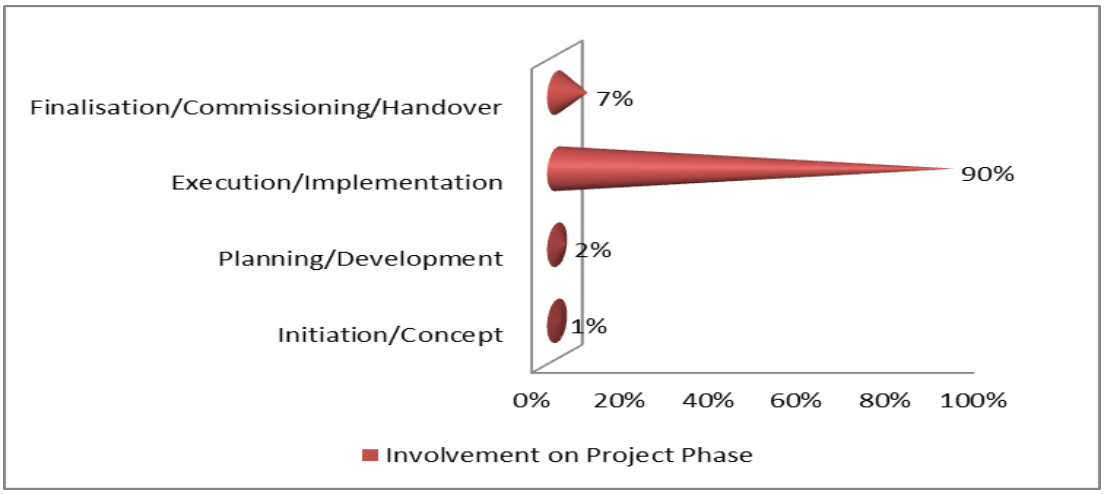

When asked regarding the nature of projects in which they are involved, 80% answred projects are integrated in aprogram of projects while 20% said projects are independent to each other (figure 15).

**Figure 15: Number of disciplines involved at UEAP Projects**



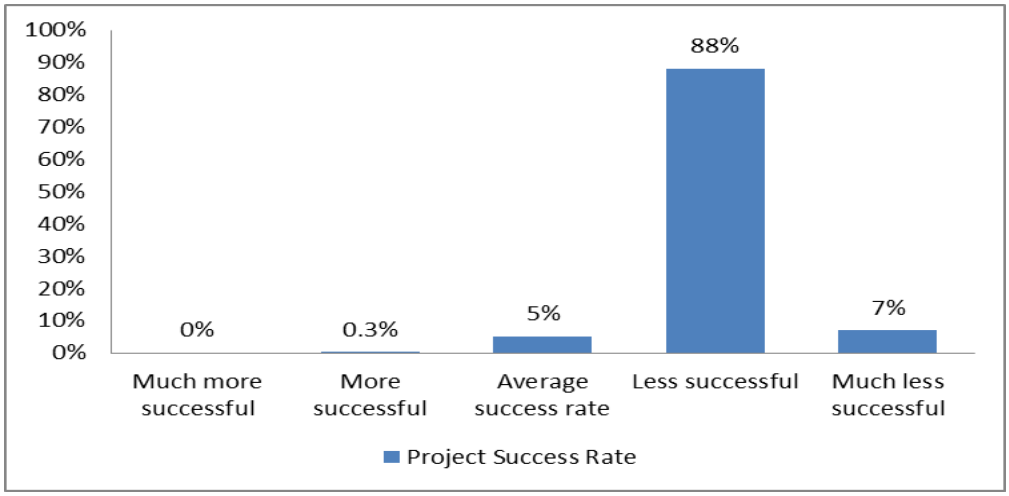
When respondents reply to the question ‘at which level of the project were you involved?’ 90% of the repondent answered they are involved at the execution or implementation phase while 7% said they are involved at the finalization/commissioning/handover phase(figure 16).

**Figure 16: Involvement on Project Phase at UEAP Projects**



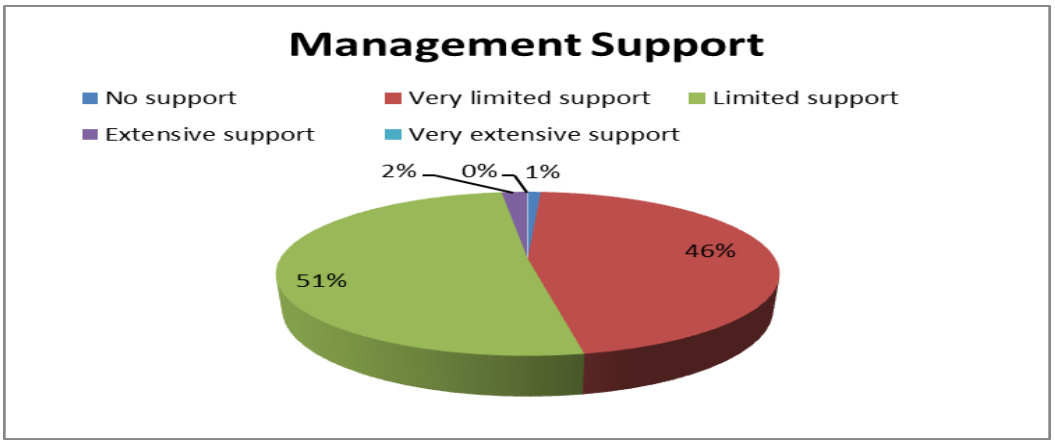

Respondents were also asked to rate the success rate of projects in which they are engaged. 88% of th respondents answered that UEAP projects are less successful followed by 7% of projects much less successful. Only 5% of the respondents answered that the projects are perceived to be having an averge success rate and 0.3% of them said the projects are more successful (figure 17).

**Figure 17: Success rate of UEAP projects**



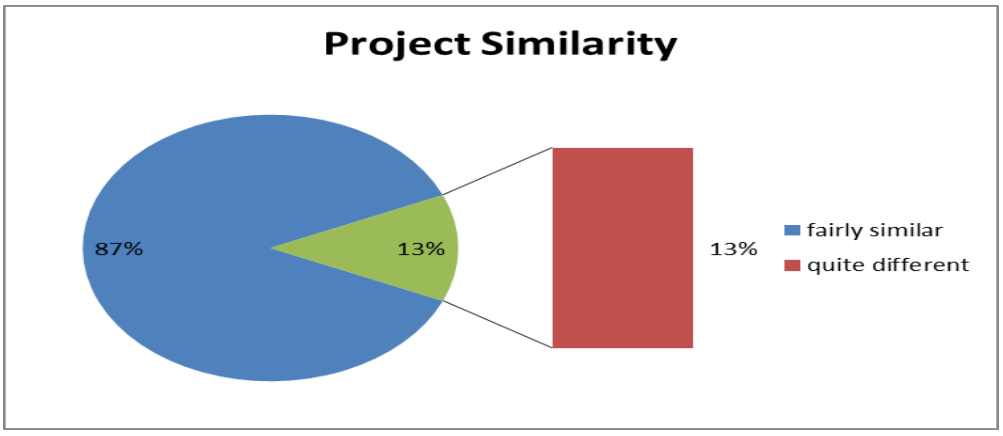
When asked about the level of management support on UEAP projects, 51% of the respondents answered that they got limited support while 46% of them answered they have a very limited support. Only 2% and 1% of the participants said they received extensive and very extensive support from the management (figure 18).

**Figure 18: Management support towards projects at UEAP**



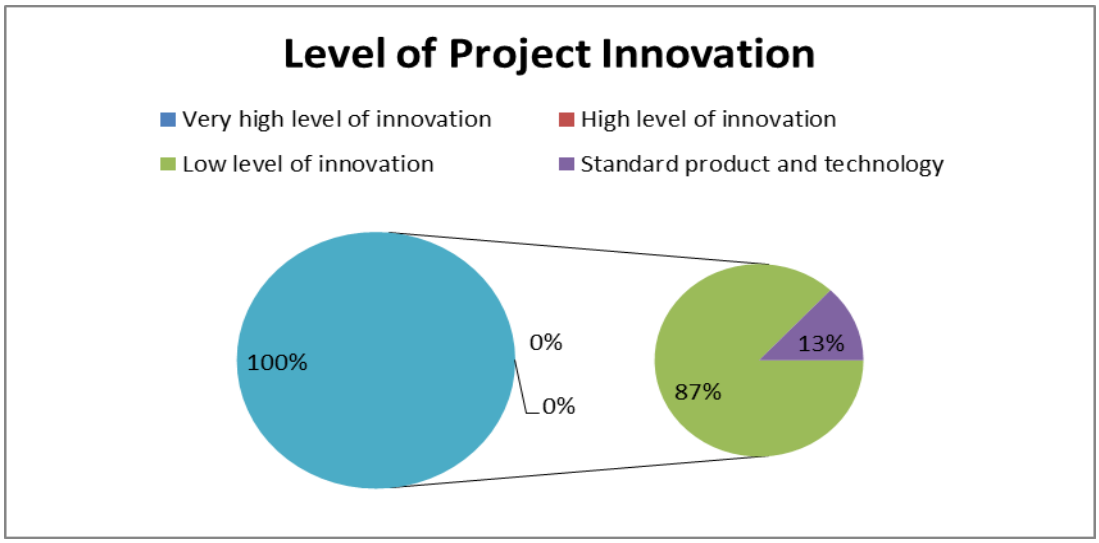

Regarding a question on the similarity of UEAP projects, 87% of the respondents answered that UEAP projects are fairly similar while 13% of them said the projects are quite different to each other (figure 19).

**Figure 19: Similarity of Projects at UEAP**



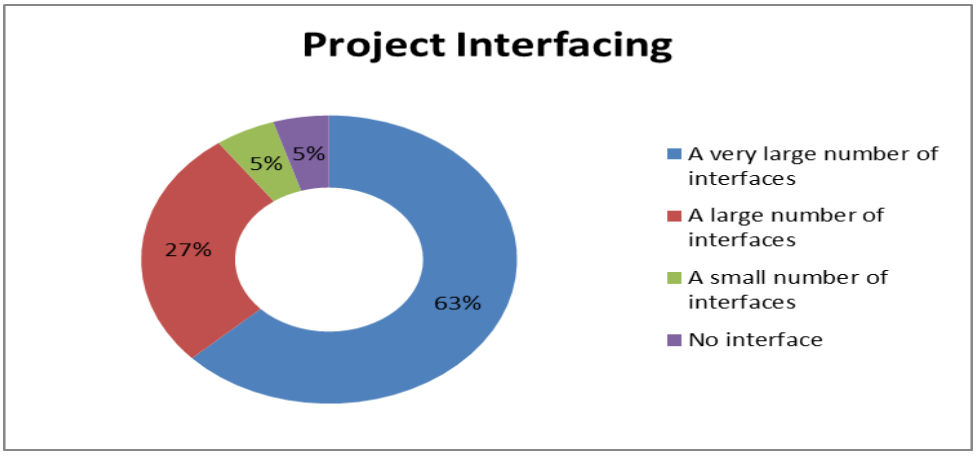

Contrary to this, when asked regarding level of innovation in UEAP projects, 87% of the respondents answered that there is a low level of innovation and 13% of them said there is a standard application of products and technology (figure 20).

**Figure 20: Level of Project Innovation at UEAP**




Regarding projects' extent interfacing among eachother, 63% of the respondents replied there is a very large number of interfaces while 27% of the respondents replied there is a large number of interfaces and only 10% of the respondents replied either there is a small number of interfaces or there is no interfaces among projects (figure 21).

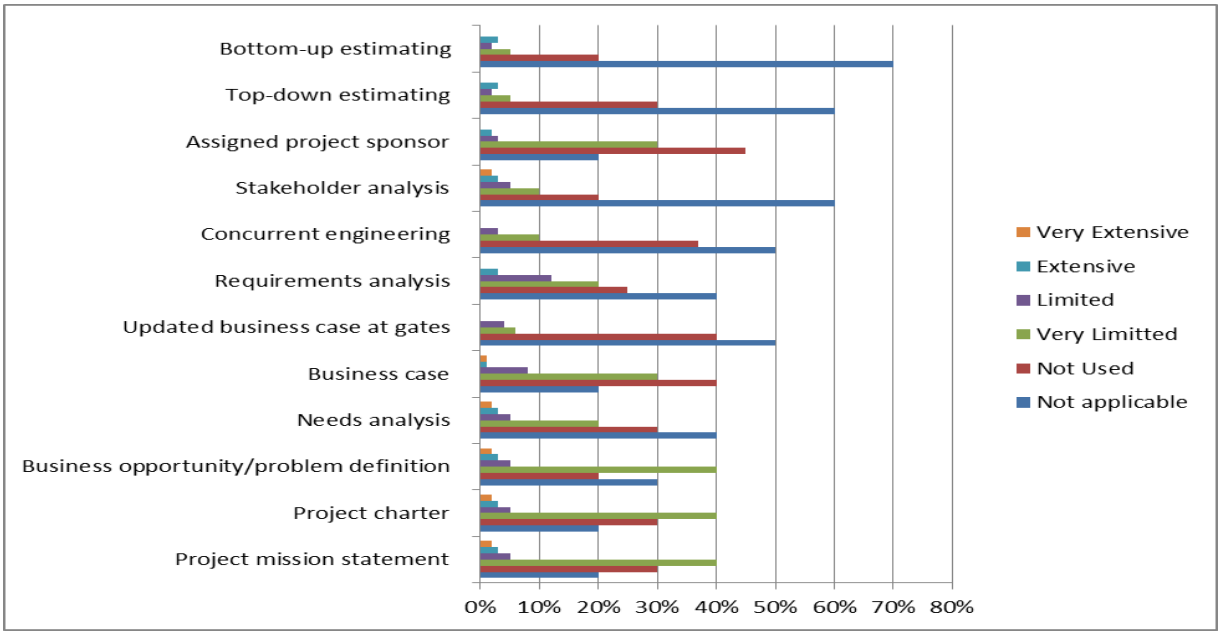
**Figure 21: Project Interfacing at UEAP**



### *4.4.2 Findings on Project Management Systems, Techniques and Tools*

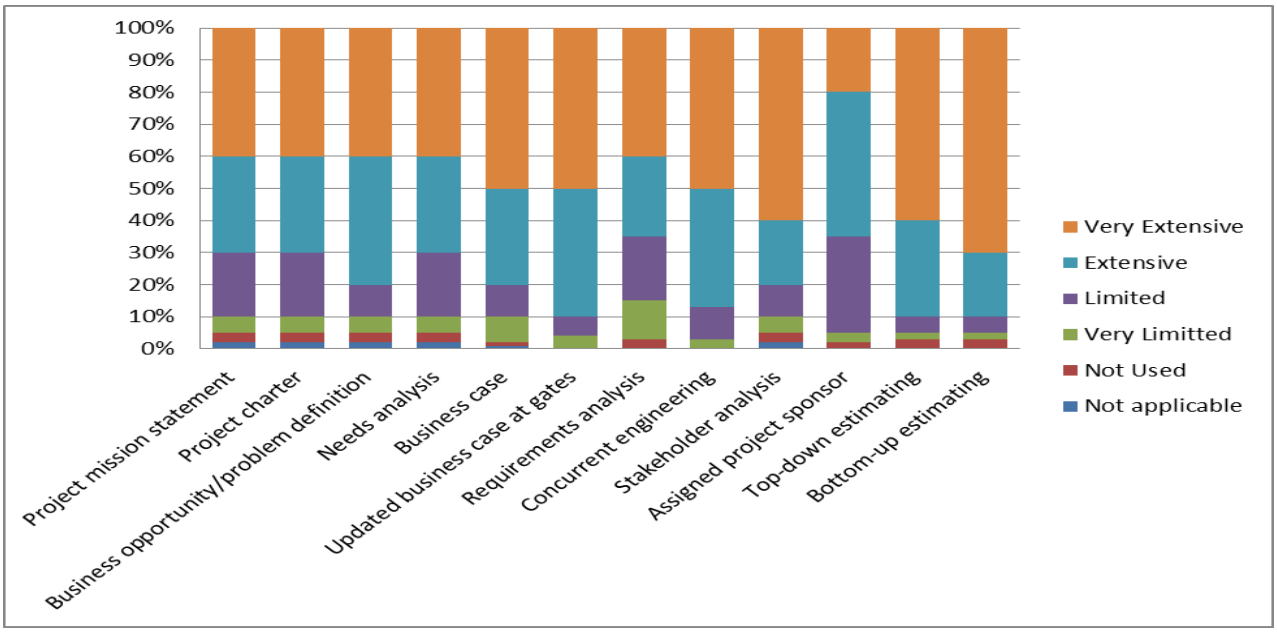
Respondents were asked to indicate the level of use of key project management techniques up on planning in the area of project initiation. As indicated in figure 22, the findings indicate that most of the techniques are either not applicable, not used or their application is very limited (refer figure 22 below).

**Figure 22: Level of use of Project Initiation tools or techniques at UEAP**



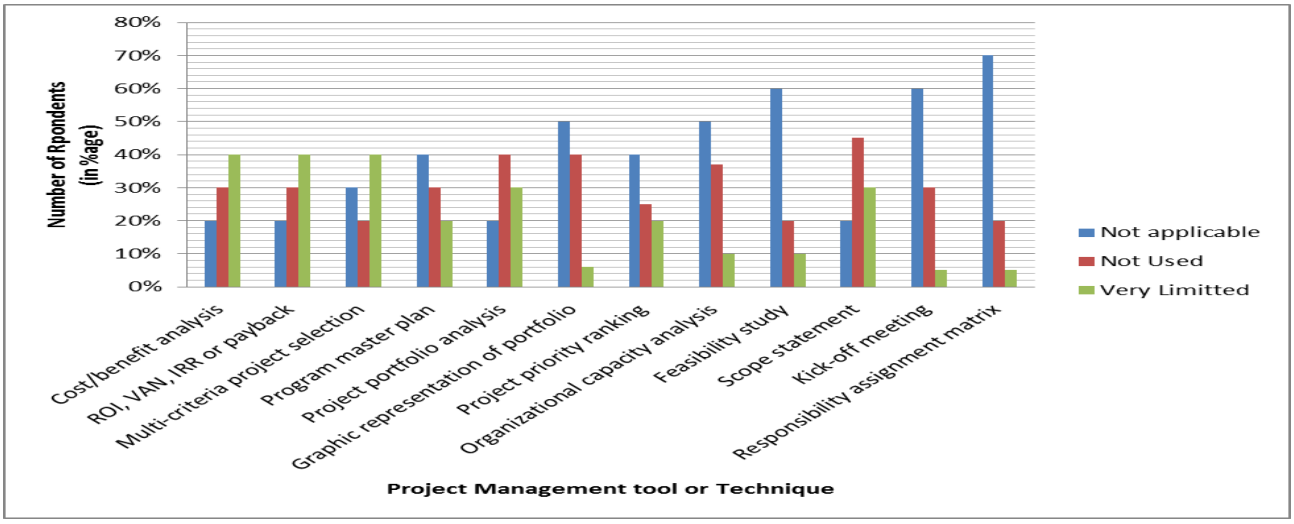

On the other hand, when the respondents were asked whether more extensive or better use of this tool or technique would improve project performance, more than 90% of the respondents replied that they anticipate a very extensive or extensive improvement of projects (figure 23).

**Figure 23: Improvement from use of Project Initiation tools or techniques at UEAP**



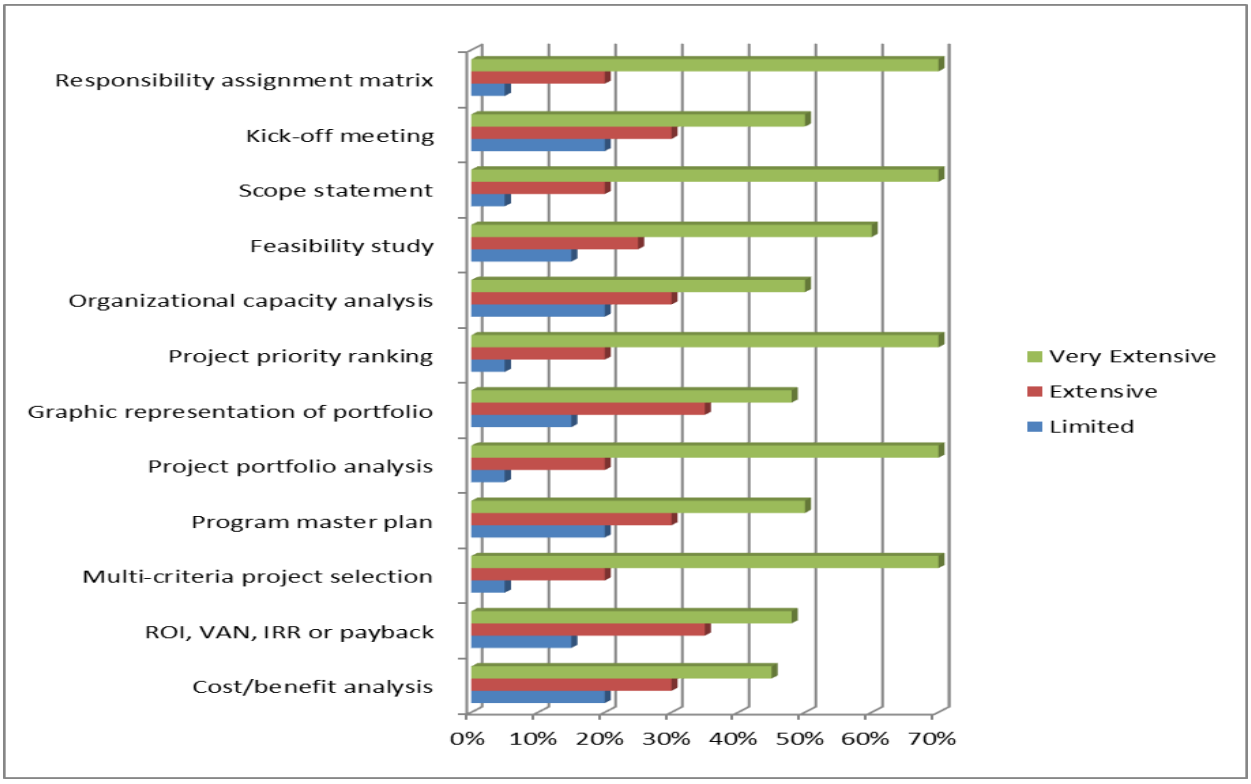

Respondents were asked to indicate the level of use of key project planning tools or techniques up on. As indicated in figure 24, about 90% of the respondents answered that most of the techniques are either not applicable, not used or their application is very limited mainly in terms of use of responsibility assignment matrix, kick-off meeting, feasibility study, and organizational capacity analysis (figure 24).

**Figure 24: Level of use of Project Planning tools or techniques at UEAP**



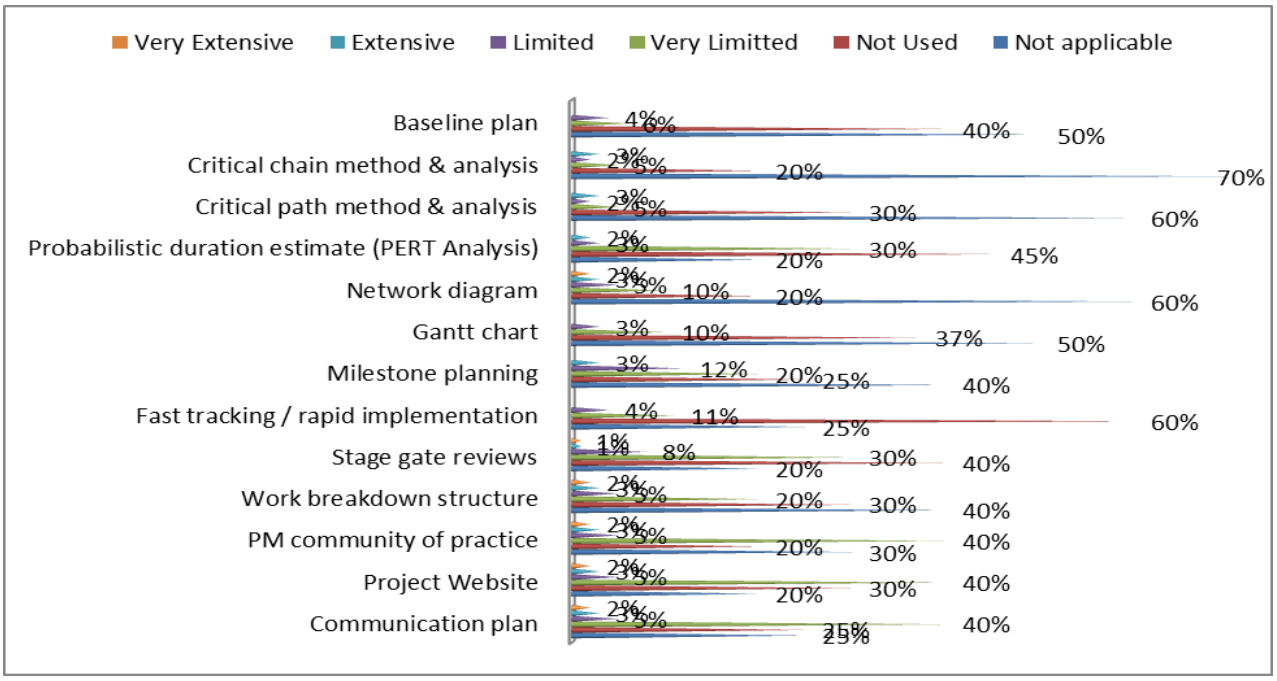
To the reverse, when respondents are asked to indicate the level of improvement they anticipate from use of key project planning tools or techniques, more than 95% of the respondents expect a very extensive or an extensive improvement mainly in utilizing tools or technics like responsibility assignment Metrix, scope statement, project priority ranking, project portfolio analysis and multi-criteria project analysis (figure 25).

**Figure 25: Level of Improvement from use of Project Planning tools or techniques at UEAP**



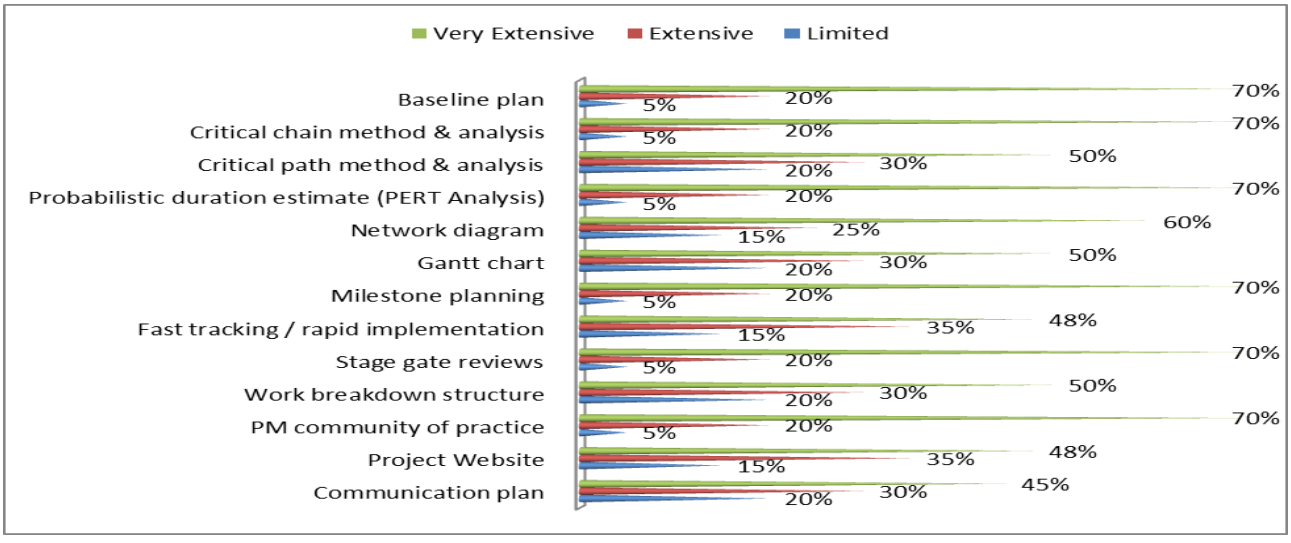

When asked to indicate the level of use of key project implementation tools or techniques, about 90% of the respondents on average answered that most of the techniques are either not applicable, not used or their application is very limited mainly in terms of use of critical chain method and analysis, critical path method and analysis, network diagram, fast tracking/ rapid implementation, and Gantt chart (refer figure 26).

**Figure 26: Level of use of Project Implementation tools or techniques at UEAP**



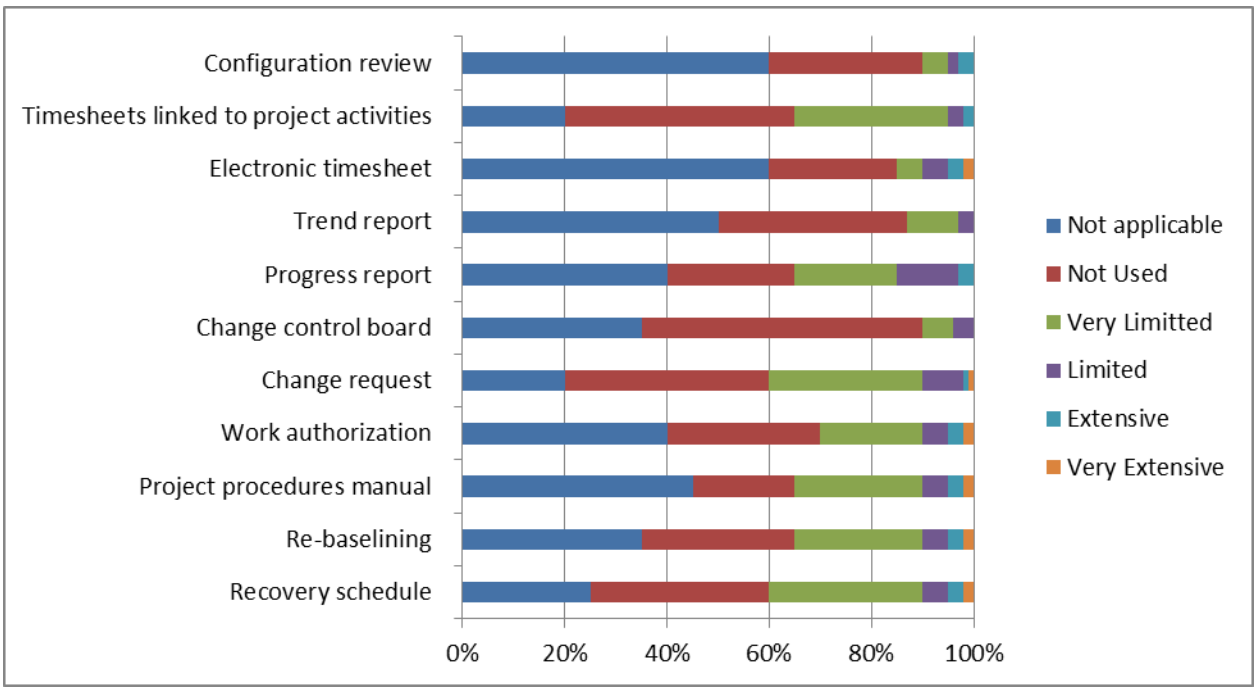

When asked if adoption of the project implementation tools or techniques can make improvement, close to 90% on average answered that adoption of these implementation tools can bring in very extensive or extensive improvement (refer figure 27 below).

**Figure 27: Level of Improvement from use of Project Implementation tools or techniques at UEAP**



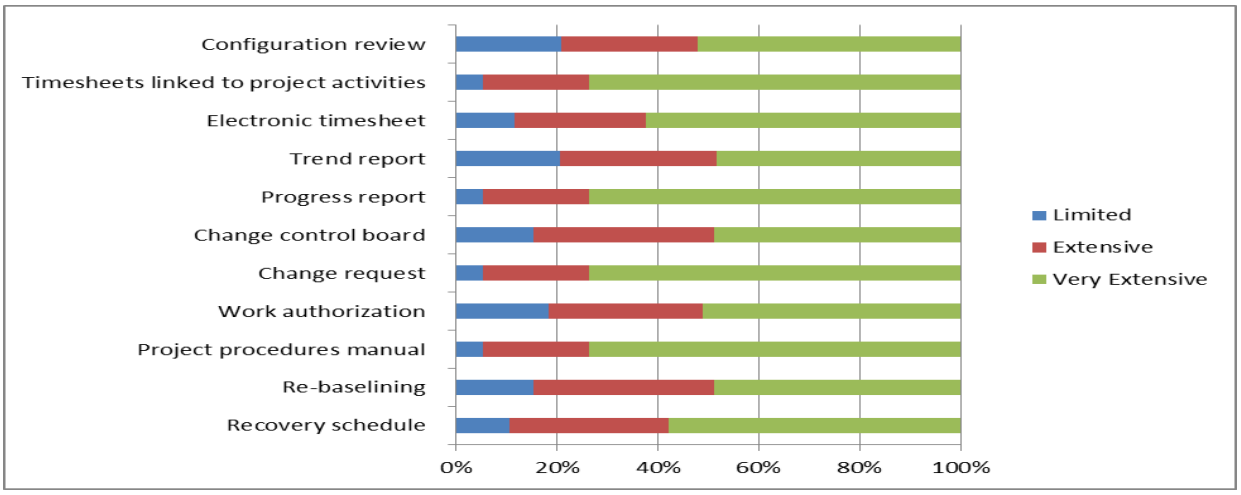
Respondents were asked to indicate the level of use of project follow-up techniques or tools. As can be seen from figure 28 below, on average 90% of the respondents answered that the level of use of most of the project follow-up tools is either not applicable or not used or very limited (figure 28).

**Figure 28: Level of use of Project Follow-up tools or techniques at UEAP**



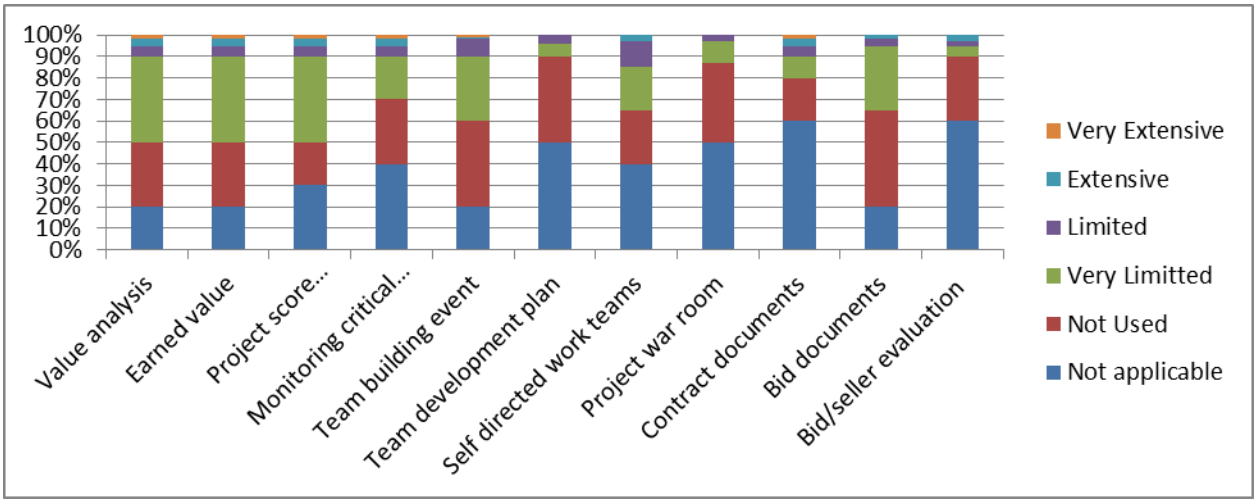

In terms of the expected improvement level figure 29 below indicate that more than 90% of the respondents believe that their adoption will bring in either very extensive improvement or an extensive improvement (figure 29).

**Figure 29: Level of Improvement from use of Project Follow-up tools or techniques at UEAP**



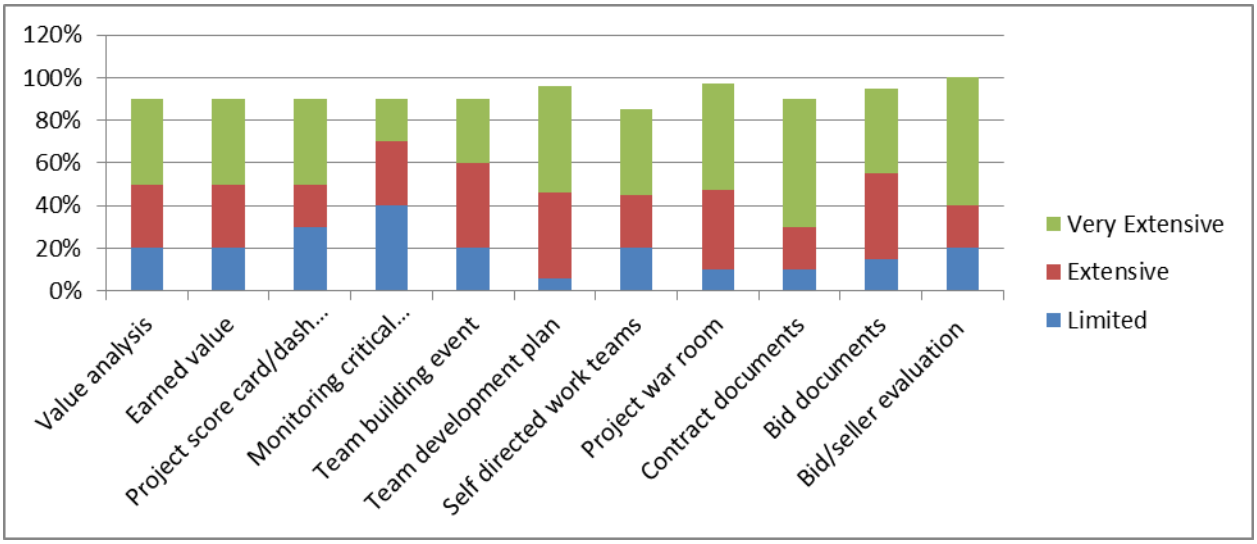
In response to the question regarding the level of use of project monitoring tools or techniques, majority of the respondents(88%) answered that these tools are either not applicable, not used or very limitted (figure 30).

**Figure 30: Level of use of Project Monitoring tools or techniques at UEAP**



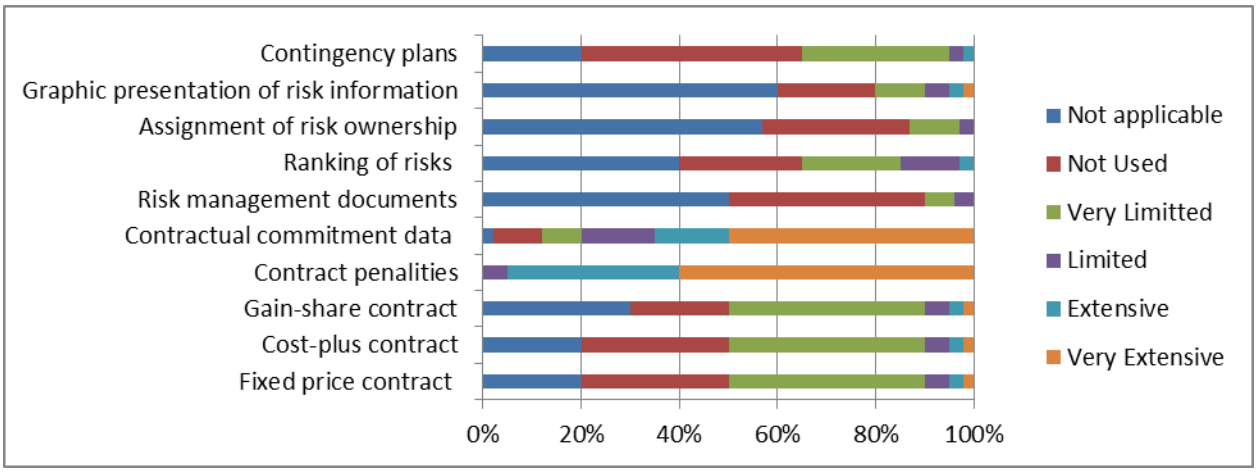

In terms of expected improvement from application of these monitoring tools, close to 95% of the respondents answered that they expect very extensive or extensive improvement (figure 31).

**Figure 31: Level of Improvement from use of Project Monitoring tools or techniques at UEAP**



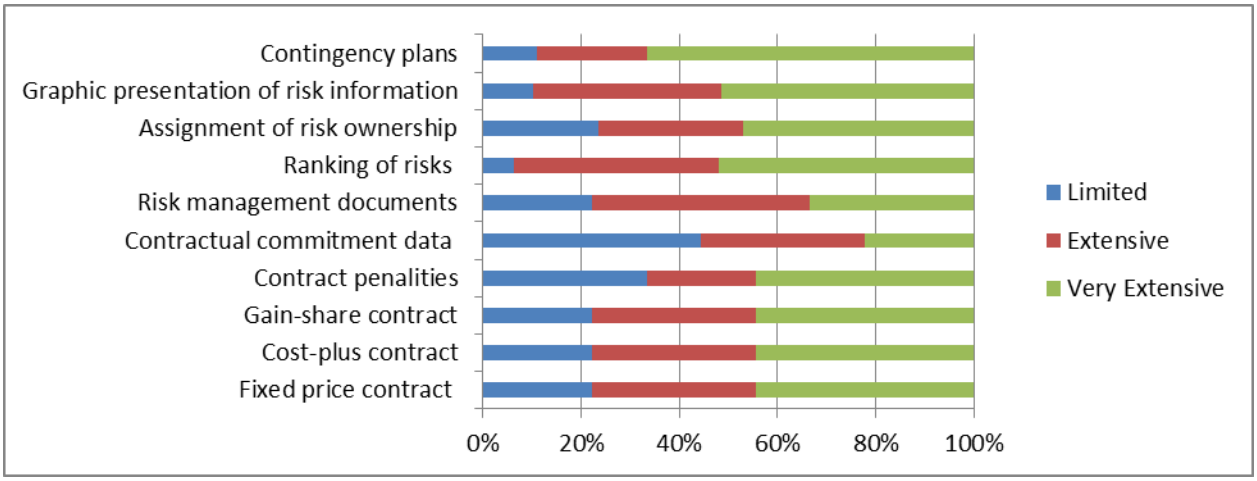
Respondents were asked regarding the level of use of project risk management tools or techniques and close to 90% of the respondents replied these tools either not applicable or not used or very limitted in their use (figure 32).

**Figure 32: Level of use of Project Risk Management tools or techniques at UEAP**



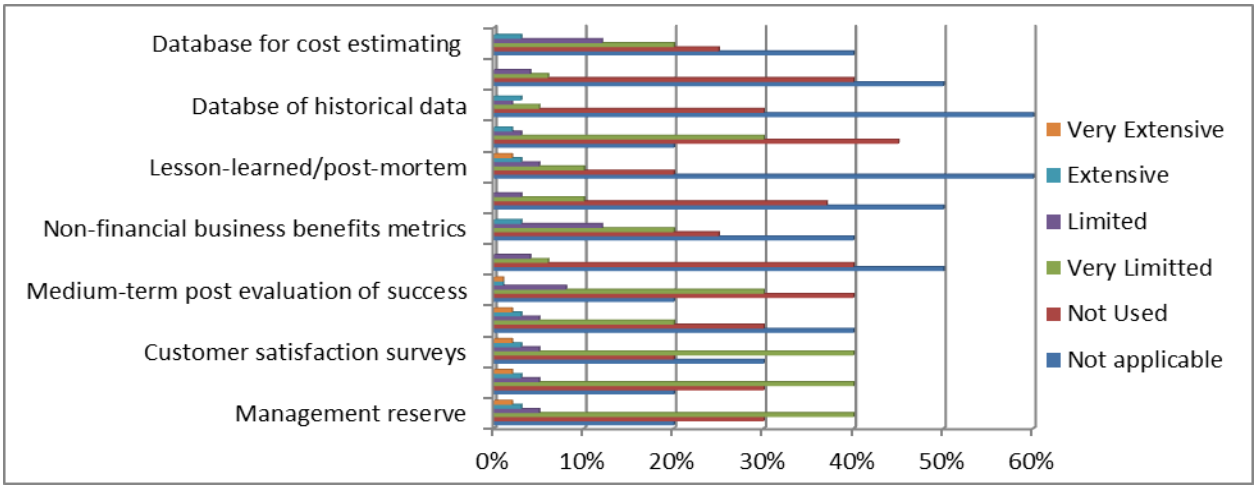

In terms of the expected improvement from the application of these project risk management tools or techniques, again majority of the respondents replied they expect very extensive or extensive as can be observed from figure 33 below.

**Figure 33: Level of Improvement from Use of Project Risk Management tools or techniques at UEAP**



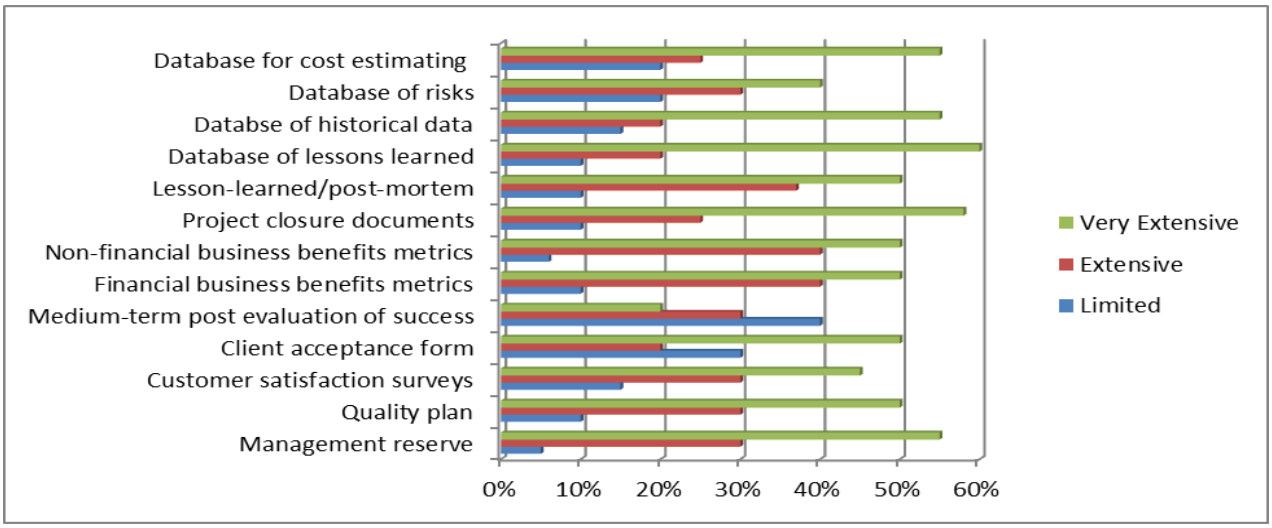
Respondents were asked on the level of use of project evaluation tools or techniques and close to 98% of the respondents replied that their use or application is very limitted or not used or not applicable at all (figure 34).

**Figure 34: Level of use of Project Evaluation tools or techniques at UEAP**



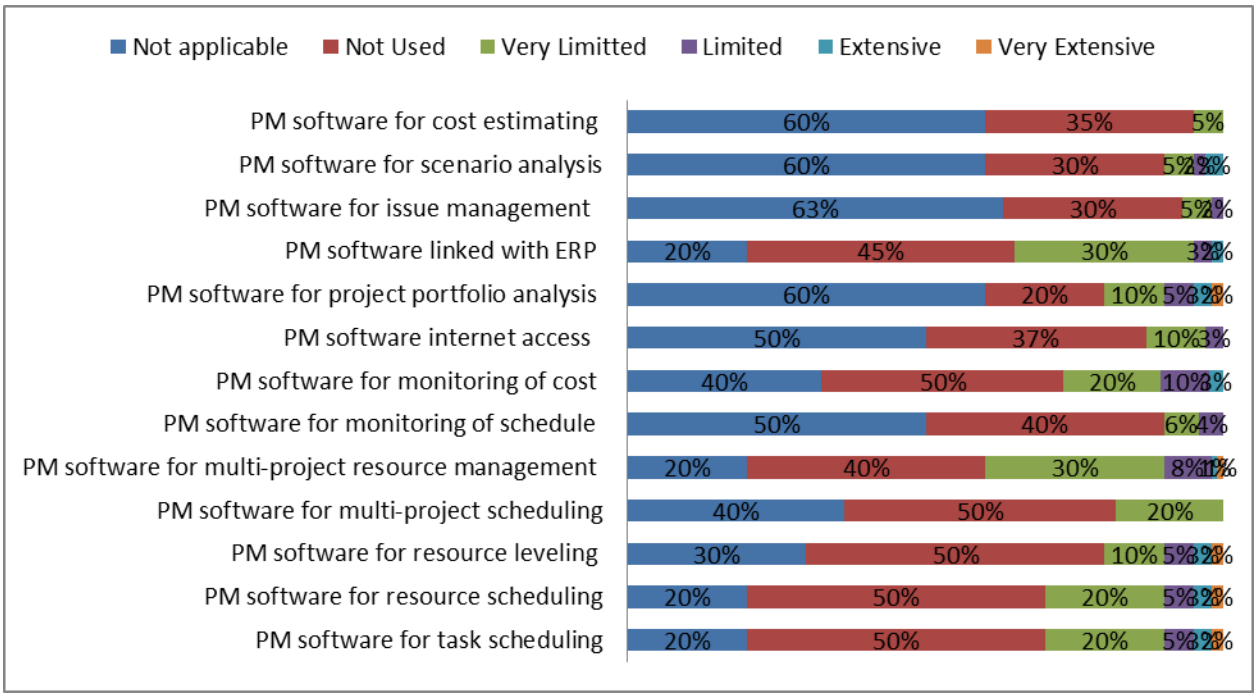

Close to 95% of the respondents expect that adoption of these project evaluation tools will bring very extensive or extensive improvements (figure 35).

**Figure 35: Level of use of Project Evaluation tools or techniques at UEAP**



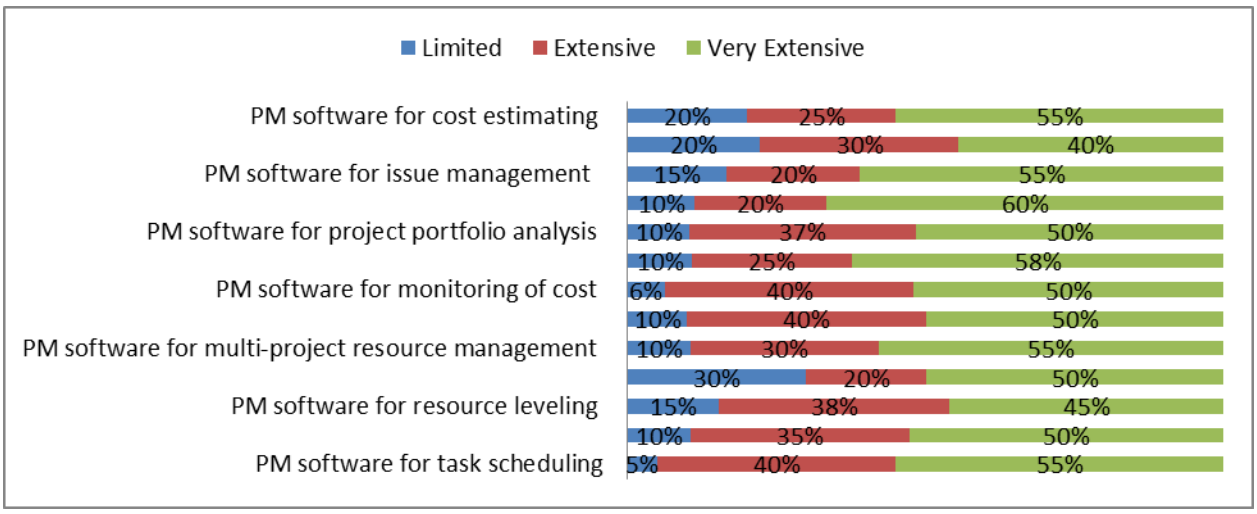

Finally, repondents were asked the level of use of project management tools and softwares and more than 98% said that the level of use of these PM tools and softwares is either inapplicable, not used or vey limitted (figure 36).

**Figure 36: Level of use of Project Management Software and tools at UEAP**




In terms of the expected improvement from adoption of these tools, about 90% of the respondents replied that they expect very extensive or extensive improvements from the adoption of these tools or techniques (figure 37).

**Figure 37: Level of use of Project Management Software and tools at UEAP**



## 4.5 Case narratives and analyses

### *4.5.1 Background on UEAP*

According the interview with UEAP planning department and the documents reviewed, the country has been implementing different programs and initiatives to enhance the electricity access. The first major rural electrification initiative was started in 1999/2000, when the government undertook the implementation of the Rural Electrification Project. This Project focused essentially on extending the electricity network to Woreda towns and major towns located close to sub-station or existing distribution lines. In total, 164 towns were electrified over the 1999/2000 to 2004/05 period. In 2005 the government has introduced the Universal Electrification Program (UEAP) to enhance the grid electricity coverage to rural towns and villages of the country. The UEAP is a more ambitious project than its predecessor the Rural Electrification Project. Launched in 2005/2006 for a five year period, it mainly includes the expansion transmission and distribution networks. In terms of generation, the UEAP includes the construction of nine small-localized off-grid electric power generating stations. The main objective of UEAP is to promote the socio-economic development of rural areas in the country by expanding the electricity network coverage to 90%.The scope of the program has been to extend the transmission line, build substations, low voltage distribution networks and installation of transformers. The task of connecting to individual customers by installing meters has not been included in the scope of the UEAP. It has been the mandate of the distribution department in the EEU (UEAP, 2016).

According to the interview with the UEAP's planning department, the Program is funded by several stakeholders, including the government which allocates 2.5 billion ETB per year. Some of the other partners include the World Bank, Bank of Arab for Economic Development in Africa (BADEA), the Kuwait Fund, African Development Bank (AfDB) and bilateral cooperation from development partner countries like Indian Government (UEAP, 2016). According to the interviews with UEAP's planning department, the UEAP has been in a continuous restructuring in the last few years. The program was established under the former EEPCo but after the unbundling of the EEPCO in 2013 into two separate entities Ethiopian Electric Power (EEP) and Ethiopian Electric Utility (EEU), there have been changes in the Program's institutional arrangements. At

the first stage of the unbundling, the UEAP has been under EEP but since the beginning of 2016 the program has been under the EEU. The UEAP has a federal level program office and 8 regional offices in Afar, Tigray, Ormiya, Amahara, Gambella, SNNP, Benishangul Gumuz and Somali regions. The Harari region and Dire Dawa city administrations are under Oromiya regional office. In addition to the grid based electrification program, the government has also established Rural Electrification Agency to promote and deploy alternative energy technologies such as solar, efficient cook stove and biogas technologies for rural households. Accordingly, a Rural Electrification Fund (REF) was established in 2003 to provide electricity access for the rural communities which are not electrified by the national grid. According to the interviews with REF department and Documents reviewed, the program was started by installing 21 diesel generators in rural areas and also has installed more than 25000solar home systems so far. Moreover, more than 600 institutional solar systems have been installed by the program. However it is indicated that the off-grid program has not been given much attention and it has been facing challenges because of lack of operating budget and absence of a dedicated offices in the regional states.

Generally, the government's main focus has been extending the national grid to rural towns and villages in the country through the UEAP even though the connectivity rate so far has been insignificant. This is because the success or performance of various projects under UEAP was very low due to a number of reasons including delays due UEAP's poor project management, design problems, contractors' low performance, material/logistics shortage, feasibility, and supervision problems etc. (Meaza, 2017).

### *4.5.2 Background on Case Project*

In this section, a specific case of a project handled by a contractor named KBC (name changed for the sake of confidentiality). The project is a distribution construction project in Somali region of Ethiopia. The project name assigned for KBC by the employer or project owner UEAP is **UEAP-B-1/2003** (again project name is changed for the sake of confidentiality). This project is considered as a case for analysis due to the fact that it is the most delayed with a huge amount of cost overrun showing a wide range of scope change. Apart from this, the project is located remotely with harsh environmental conditions.

### *4.5.3 Case Findings and Analysis*

Based on internal documents from KBC as well as different correspondences among the project owner and the contractor, the following findings were identified which are also briefly analyzed in line with conventional PM practices;

1) ***The project period was initially granted for a period of two years but it has been seven year since the contract period has elapsed and yet the project is still active.***

   The contract was signed among UEAP and KBC in December, 2010 having a completion period of two years. However, the project period has been extended repeatedly and it is still active after seven years from the initial closing period. This indicates a significant amount of schedule overrun implying that proper project planning was not conducted initially.

2) ***The project has faced at least five project management challenges on which both UEAP and KBC have agreed on.***

   - As per their contract, the employer – UEAP has frequently failed to avail critical inventory at the right time and with the right quantity,
   - Payments for completed works has been delayed repeatedly and numerous unethical corrupt practices were observed by project supervising staff of the project owner – UEAP,
   - UEAP has frequently changed project sites forcing the contractors to relocate resources and to abandon works in progress. Worse than this, newly assigned sites were bringing in new challenges to the contractor,
   - Because of missing technical works which should have been set prior to project commencement, it was difficult to link towns and cities which were dependent on diesel generators, and
   - UEAP management has shown lengthy decision making processes on various issues which further fueled the schedule and cost overruns.

3) ***Many factors which are external to the project but internal to the project owner (UEAP) have influenced delivery of the project.***

In 2015, UEAP was restructured which made it to report to a new organization under the ministry (**MoWIE**). The rearrangement has taken an extended period for stabilization and focus towards construction projects in the pipeline also took long.

4) ***An expected security and related issues have hindered the contractors' PM activities***

The project location i.e. Somali region of Ethiopia was vulnerable to numerous security threats before and after which forced employees of the contractor to flee. In addition, regional coordinators were also frequently absent for supervision and hence payment processing needs.

5) ***The contractor has made enormous and continuous efforts to amicably resolve various issues***

As evidenced by the correspondences written from KBC to UEAP office, the contractor has exerted significant efforts to solve problems like delays in resource mobilization, design errors, delays in raw material delivery, delays in commissioning of various interim works which shall be conducted by regional and head quarter staff, miscommunications like misplaced/wrongly sent payments of other contractors and double payments etc. Various UEAP offices have also confirmed such errors and delays via written letters, some of which are recognizing the contractor's integrity.

6) ***There were surprising responses from the employer/owner (UEAP) which are not consistent with the terms and conditions in the contract. Additionally, some of the actions were unprofessional from PM point of view***

In some of the correspondences reviewed, some UEAP management and supervision staff has written warning letters to the contractor for cases and errors committed at their end. Responses were also observed to be unprofessional even when it was confirmed that the gaps are at UEAP side for example, forced site relocations which were meant for other projects and contractors.

# CHAPTER FIVE – CONCLUSIONS AND RECOMMENDATIONS

## 5.1 Recommendations

Based on the PM practice findings from the survey conducted on UEAP which are also further validated by the case study on one of the most delayed projects which has huge cost overrun and scope changes, the poor level of project management practices are seriously affecting the power distribution construction projects owned and administered by UEAP. Accordingly, the following strategic recommendation are forwarded for action by UEAP senior management and for appropriate intervention by concerned organs like the government, donor/financiers and other stakeholders;

### 1. Recommendations on overall Project Management Processes

The existence of well-defined project management processes — often grouped into a project management methodology — differentiates companies that are able to consistently deliver superior project results. Accordingly, UEAP shall adopt the following components of project management processes for application in to administering its current and future projects;

- *Standardization and institutionalization of project management processes,*
- *Integration with other corporate processes (e.g., procurement, strategic planning),*
- *Prioritization of projects and application of a standard project lifecycle,*
- *Utilization of project portfolio techniques, and continuous improvement.*

### 2. Recommendations on organizational structure related project management issues

An organization's operating framework is fundamental to its project management performance. Accordingly, the enterprise shall consider the following aspects of organizational structure for adoption in to its project management;

- *Resource ownership (mainly staff and budgets),*
- *Definition of clear roles and responsibilities,*
- *Support and involvement of senior and top management, and*
- *The availability of a Project/Programme Management Office.*

**3. Recommendations on the people aspect of project management practices**

Teamwork is an integral component of project management; therefore, the ability to manage people is an essential skill for project managers. When it comes to project success, project or programme managers carry a great deal of the responsibility, but success is also dependent on the performance of others who are in key project roles (e.g., project team members, project sponsors, customers and stakeholders). Therefore, well developed people management skills are fundamental to a high project management maturity level. Accordingly, UEAP shall work on;

- *Enhancing project managers' skills,*
- *Provision of development and training programs for its project supervision staff,*
- *Developing positive organizational culture, motivation and incentives, and*
- *Instituting career opportunities for project managers.*

**4. Recommendations on systems and tools related project management practices**

Organizations like UEAP purchase and create systems and tools to automate and support their project management processes. Thus, the enterprise shall seriously consider the following issues;

- *Availability of company-wide software,*
- *Trainings and capacity building programs on software use and application, and*
- *Systems for capacity management, cost tracking, benefit realization and etc.*

## 5.2 Recommendation for Future Research

Due to time constraints, this study considers selected few case. Thus, future studies are recommended to expand the horizon and investigate the project management practices and related issues in similar as well as other areas of power construction projects. This will provide a clear picture of the national level PM practices in the Ethiopian power sector. Accordingly, a comprehensive framework for best project management practices can be recommended for the industry.

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## APPENDIX – QUESTIONNAIRE

# A SURVEY ON PROJECT MANAGEMENT PRACTICES, TOOLS & TECHNIQUES

SECTION I – DEMOGRAPHIC QUESTIONS

**1. AGE IN YEARS**

1) up to 25
2) 25-29
3) 30-39
4) 40-49
5) 50 years and over

**2. GENDER**

1) Male
2) Female

**3. EDUCATION Please indicate the highest level of education obtained**

1) Technical qualification ☐
2) Undergraduate Degree ☐
3) Master's certificate or equivalent ☐
4) Graduate degree ☐
5) Other (please specify)_____

**SECTION II – PROJECT MANAGEMENT EXPERIENCE**

**Direction – Answer the following questions (4 to 27) by circling the answer of your choice.**

**4. Please indicate the level of project management experience you have by recording the total number of years you have been engaged at each level.**

| Level | Year of Experience | | | | | |
|---|---|---|---|---|---|---|
| | 1 to 3 years | 4 to 6 years | 7 to 9 years | 10 to 12 years | 13 to 15 years | more than 16 years |

| | | | | | | |
|---|---|---|---|---|---|---|
| Team Member | | | | | | |
| Project Manager | | | | | | |
| Programme Manager / Director | | | | | | |
| Other roles in Project Management | | | | | | |

**5. What is your current primary role? (select one only)**

1) Team Member
2) Project Manager
3) Program Manager / Director
4) Other (please specify)_____

**6. Do the projects you usually work on involve more than one geographic region? Base your selection on one of the following categories.**

1) One city/region
2) National

**7. How would you describe the organizational structure in your operational area ?**

1) Functional
2) Weak matrix
3) Balanced matrix
4) Strong matrix
5) Project based

**8. How many employees work in your organization?**

1) 1 to 10
2) 11 to 50
3) 51-200
4) 201-500
5) 501-1000
6) >1,000

**9. How many employees of your organization are project managers?**

1) 1 to 5
2) 6 to 20
3) 21-50
4) 51-100
5) 100-250
6) >251

**10. Which category best describes the project management activities/environment in which you work?**

1) Procurement
2) Supply Chain Management

3) Engineering
4) Project Site Supervision
5) Other (please specify)_____

**11. What is your organization's primary business activity? (select one only)**

1) Engineering & Construction
2) Business services
3) Information Technology and Telecommunications
4) Computers/Software/DP
5) Industrial Processes
6) Other (please specify)_____

**12. The deliverable of your current primary project is of which of the following types? (select one only)**

1) Engineering & Construction
2) Business services
3) Information Technology and Telecommunications
4) Computers/Software/DP
5) Industrial Processes
6) Other (please specify)_____

**13. Which of the categories listed below best describes the level of maturity of the project management systems in your operational area? (select one only)**

1) Initial Level - ad hoc and chaotic; relies on the competence of individuals not the organization's
2) Repeatable Level - there is a project management system and plans are based on previous experience.
3) Defined Level - common, organization wide understanding of project management activities, roles and responsibilities.
4) Managed Level - stable and measured processes against organizational goals; variations are identified and addressed

5) Optimising Level - the entire organization is focused on continuous improvement.

**14. What is the typical value (in Ethiopian Birr, ETB) of the projects you work on or manage, in your primary project role?**

1) 0 < 50,000
2) 50,001 - 250,000
3) 250.001- 1,000,000
4) 1,000,001- 5,000,000
5) 5,000,001 - 10,000,000
6) 10,000,001 - 25,00,000
7) 25,000,001 - 50,000,000
8) > 50,000,000

**15. How many projects do you typically work on, or manage, at one time?**

1) 1
2) 2
3) 3
4) 4 -6
5) more than 7

**16. What is the typical duration of the primary project(s) that you work on?**

1) Up to 3 months
2) 3 to 6 months
3) 6 months to 1 year
4) 1 to 2 years
5) > 2 years

**17. What level of authority do you have in your current primary project role? (select one only)**

1) Full authority to achieve project outcomes.
2) Authority within established project plan
3) Limited authority - parameters set by others with key decisions referred to higher levels of management

**18. Are the projects you usually work on well defined or ill defined? Base your response on the level of project definition at the point when you would typically become involved.**

1) Well defined
2) Ill defined

**19. Do the projects you usually work on involve a diverse range of disciplines or a narrow range of disciplines? Discipline means specialisation of skills or area of formal training.**

1) 1 discipline
2) 2 disciplines
3) 3 to 5 disciplines
4) 6 to 10 disciplines
5) >10 disciplines

**20. Are the projects you usually work on part of a program with larger objectives or independent projects ?**

1) Independent projects
2) Integrated in a program of projects

**21. Indicate the phase(s) of a project during which you are most often involved.**

1) Initiation/Concept
2) Planning/Development
3) Execution/Implementation
4) Finalisation/Commissioning/Handover

**22. Compared to other organizations of the same sector, how would you qualify the rate of project success in your organization?**

1) Much more successful
2) More successful
3) Average success rate
4) Less successful
5) Much less successful

**23. Does your organization support your use of tools or techniques with: templates, training, detailed instructions and procedures?**

1) No support
2) Very limited support
3) Limited support
4) Extensive support
5) Very extensive support

**24. Are the projects you usually work on similar to one another or different?**

1) Fairly similar
2) Quite different

**25. What is the level of product or technical innovation in your projects?**

1) Very high level of innovation
2) High level of innovation
3) Low level of innovation
4) Standard product and technology

**26. Do the projects you usually work on have many interfaces with other systems/services/products/projects?**

1) A very large number of interfaces
2) A large number of interfaces
3) A small number of interfaces
4) No interface

**27. Is competent project personnel available for the projects you usually work on?**

1) Project needs are fully satisfied
2) Project needs are mostly satisfied
3) Project needs are partially satisfied
4) Project needs are not satisfied

**SECTION III - FOR EACH TOOL PRESENTED BELOW (QUESTIONS 28 to 29), ANSWER THE FOLLOWING QUESTIONS**

A – Use: Extent of use of this tool or technique.

B – Improvement: In your opinion, more extensive or better use of this tool or technique would improve project performance.

**28. A - Extent of Use(0: Not used 1: Very limited 2: Limited 3: Extensive 4:Very extensive)**

| Tool or technique | Not applicable | 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|
| Project mission statement | | | | | | |
| Project charter | | | | | | |
| Business opportunity/problem definition | | | | | | |
| Needs analysis | | | | | | |
| Business case | | | | | | |
| Updated business case at gates | | | | | | |
| Requirements analysis | | | | | | |
| Concurrent engineering | | | | | | |
| Stakeholder analysis | | | | | | |
| Assigned project sponsor | | | | | | |
| Top-down estimating | | | | | | |
| Bottom-up estimating | | | | | | |

**29. B – Improvement from more or better use (0: No improvement 1: Very limited 2: Limited 3: Extensive 4:Very extensive)**

| Tool or Technique | No opinion | 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|
| Project mission statement | | | | | | |
| Project charter | | | | | | |
| Business opportunity/problem definition | | | | | | |
| Needs analysis | | | | | | |
| Business case | | | | | | |
| Updated business case at gates | | | | | | |
| Requirements analysis | | | | | | |
| Concurrent engineering | | | | | | |
| Stakeholder analysis | | | | | | |
| Assigned project sponsor | | | | | | |
| Top-down estimating | | | | | | |
| Bottom-up estimating | | | | | | |

**SECTION IV – FOR EACH TOOL PRESENTED BELOW(QUESTIONS 30 TO 35), ANSWER THE FOLLOWING QUESTIONS**

A- Use: Extent of use of this tool or technique.

B- Improvement : In your opinion, more extensive or better use of this tool or technique would improve project performance.

**30. A - Extent of Use (0: Not used 1: Very limited 2: Limited 3: Extensive 4:Very extensive)**

| Tool or Technique | Not applicable | 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|
| Cost/benefit analysis | | | | | | |
| ROI, VAN, IRR or payback | | | | | | |
| Multi-criteria project selection | | | | | | |
| Program master plan | | | | | | |
| Project portfolio analysis | | | | | | |
| Graphic representation of portfolio | | | | | | |
| Project priority ranking | | | | | | |
| Organizational capacity analysis | | | | | | |
| Feasibility study | | | | | | |
| Scope statement | | | | | | |
| Kick-off meeting | | | | | | |
| Responsibility assignment matrix | | | | | | |

**31. B- Improvement from more or better use (0: No improvement 1: Very limited 2: Limited 3: Extensive 4:Very extensive)**

| Tool or Technique | No opinion | 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|
| Cost/benefit analysis | | | | | | |
| ROI, VAN, IRR or payback | | | | | | |
| Multi-criteria project selection | | | | | | |
| Program master plan | | | | | | |
| Project portfolio analysis | | | | | | |
| Graphic representation of portfolio | | | | | | |
| Project priority ranking | | | | | | |
| Organizational capacity analysis | | | | | | |
| Feasibility study | | | | | | |
| Scope statement | | | | | | |
| Kick-off meeting | | | | | | |
| Responsibility assignment matrix | | | | | | |

**32. A - Extent of Use (0: Not used 1: Very limited 2: Limited 3: Extensive 4:Very extensive)**

| Tool or technique | Not applicable | 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|
| Communication plan | | | | | | |
| Project Website | | | | | | |
| PM community of practice | | | | | | |
| Work breakdown structure | | | | | | |
| Stage gate reviews | | | | | | |
| Fast tracking / rapid implementation | | | | | | |
| Milestone planning | | | | | | |
| Gantt chart | | | | | | |
| Network diagram | | | | | | |
| Probabilistic duration estimate (PERT Analysis) | | | | | | |
| Critical path method & analysis | | | | | | |
| Critical chain method & analysis | | | | | | |
| Baseline plan | | | | | | |

**33. B- Improvement from more or better use (0: No improvement 1: Very limited 2: Limited 3: Extensive 4:Very extensive)**

| **Tool or Technique** | **No opinion** | **0** | **1** | **2** | **3** | **4** |
|---|---|---|---|---|---|---|
| Communication plan | | | | | | |
| Project Website | | | | | | |
| PM community of practice | | | | | | |
| Work breakdown structure | | | | | | |
| Stage gate reviews | | | | | | |
| Fast tracking / rapid implementation | | | | | | |
| Milestone planning | | | | | | |
| Gantt chart | | | | | | |
| Network diagram | | | | | | |
| Probabilistic duration estimate (PERT Analysis) | | | | | | |
| Critical path method & analysis | | | | | | |
| Critical chain method & analysis | | | | | | |
| Baseline plan | | | | | | |

**34. A - Extent of Use (0: Not used 1: Very limited 2: Limited 3: Extensive 4:Very extensive**

| Tool or Technique | Not applicable | 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|
| Recovery schedule | | | | | | |
| Re-baselining | | | | | | |
| Project procedures manual | | | | | | |
| Work authorization | | | | | | |
| Change request | | | | | | |
| Change control board | | | | | | |
| Progress report | | | | | | |
| Trend report | | | | | | |
| Electronic timesheet | | | | | | |
| Timesheets linked to project activities | | | | | | |
| Configuration review | | | | | | |

**35. B- Improvement from more or better use (0: No improvement 1: Very limited 2: Limited 3: Extensive 4:Very extensive)**

| Tool or Technique | No opinion | 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|
| Recovery schedule | | | | | | |
| Re-baselining | | | | | | |
| Project procedures manual | | | | | | |
| Work authorization | | | | | | |
| Change request | | | | | | |
| Change control board | | | | | | |
| Progress report | | | | | | |
| Trend report | | | | | | |
| Electronic timesheet | | | | | | |
| Timesheets linked to project activities | | | | | | |
| Configuration review | | | | | | |

**SECTION V: FOR EACH TOOL PRESENTED BELOW(QUESTIONS 36 TO 43), ANSWER THE FOLLOWING QUESTIONS**

A- Use: Extent of use of this tool or technique.

B- Improvement : In your opinion, more extensive or better use of this tool or technique would improve project performance.

**36. A - Extent of Use(0: Not used 1: Very limited 2: Limited 3: Extensive 4:Very extensive)**

| Tool | No opinion | 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|
| Value analysis | | | | | | |
| Earned value | | | | | | |
| Project score card/dash board | | | | | | |
| Monitoring critical success factors | | | | | | |
| Team building event | | | | | | |
| Team development plan | | | | | | |
| Self-directed work teams | | | | | | |
| Project war room | | | | | | |
| Contract documents | | | | | | |
| Bid documents | | | | | | |
| Bid/seller evaluation | | | | | | |

**37. B- Improvement from more or better use (0: No improvement 1: Very limited 2: Limited 3: Extensive 4:Very extensive)**

| Tool | No opinion | 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|
| Value analysis | | | | | | |
| Earned value | | | | | | |
| Project score card/dash board | | | | | | |
| Monitoring critical success factors | | | | | | |
| Team building event | | | | | | |
| Team development plan | | | | | | |
| Self directed work teams | | | | | | |
| Project war room | | | | | | |
| Contract documents | | | | | | |
| Bid documents | | | | | | |
| Bid/seller evaluation | | | | | | |

**38. A - Extent of Use(0: Not used 1: Very limited 2: Limited 3: Extensive 4:Very extensive)**

| Tool | No opinion | 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|
| Fixed price contract | | | | | | |
| Cost-plus contract | | | | | | |
| Gain-share contract | | | | | | |
| Contract penalities | | | | | | |
| Contractual commitment data | | | | | | |
| Risk management documents | | | | | | |
| Ranking of risks | | | | | | |
| Assignment of risk ownership | | | | | | |
| Graphic presentation of risk information | | | | | | |
| Contingency plans | | | | | | |

**39. B- Improvement from more or better use (0: No improvement 1: Very limited 2: Limited 3: Extensive 4:Very extensive)**

| Tool | No opinion | 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|
| Fixed price contract | | | | | | |
| Cost-plus contract | | | | | | |
| Gain-share contract | | | | | | |
| Contract penalities | | | | | | |
| Contractual commitment data | | | | | | |
| Risk management documents | | | | | | |
| Ranking of risks | | | | | | |
| Assignment of risk ownership | | | | | | |
| Graphic presentation of risk information | | | | | | |
| Contingency plans | | | | | | |

**40. A - Extent of Use(0: Not used 1: Very limited 2: Limited 3: Extensive 4:Very extensive)**

| Tool | No opinion | 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|
| Management reserve | | | | | | |
| Quality plan | | | | | | |
| Customer satisfaction surveys | | | | | | |
| Client acceptance form | | | | | | |
| Medium-term post evaluation of success | | | | | | |
| Financial business benefits metrics | | | | | | |
| Non-financial business benefits metrics | | | | | | |
| Project closure documents | | | | | | |
| Lesson-learned/post-mortem | | | | | | |
| Database of lessons learned | | | | | | |
| Databse of historical data | | | | | | |
| Database of risks | | | | | | |
| Database for cost estimating | | | | | | |

**41. B- Improvement from more or better use (0: No improvement 1: Very limited 2: Limited 3: Extensive 4:Very extensive)**

| Tool | No opinion | 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|
| Management reserve | | | | | | |
| Quality plan | | | | | | |
| Customer satisfaction surveys | | | | | | |
| Client acceptance form | | | | | | |
| Medium-term post evaluation of success | | | | | | |
| Financial business benefits metrics | | | | | | |
| Non-financial business benefits metrics | | | | | | |
| Project closure documents | | | | | | |
| Lesson-learned/post-mortem | | | | | | |
| Database of lessons learned | | | | | | |
| Databse of historical data | | | | | | |
| Database of risks | | | | | | |
| Database for cost estimating | | | | | | |

**42. A - Extent of Use(0: Not used 1: Very limited 2: Limited 3: Extensive 4:Very extensive)**

| Tool | No opinion | 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|
| PM software for task scheduling | | | | | | |
| PM software for resource scheduling | | | | | | |
| PM software for resource leveling | | | | | | |
| PM software for multi-project scheduling | | | | | | |
| PM software for multi-project resource management | | | | | | |
| PM software for monitoring of schedule | | | | | | |
| PM software for monitoring of cost | | | | | | |
| PM software internet access | | | | | | |
| PM software for project portfolio analysis | | | | | | |
| PM software linked with ERP | | | | | | |
| PM software for issue management | | | | | | |
| PM software for scenario analysis | | | | | | |
| PM software for cost estimating | | | | | | |

**43. B- Improvement from more or better use (0: No improvement 1: Very limited 2: Limited 3: Extensive 4:Very extensive)**

| Tool | No opinion | 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|
| PM software for task scheduling | | | | | | |
| PM software for resource scheduling | | | | | | |
| PM software for resource leveling | | | | | | |
| PM software for multi-project scheduling | | | | | | |
| PM software for multi-project resource management | | | | | | |
| PM software for monitoring of schedule | | | | | | |
| PM software for monitoring of cost | | | | | | |
| PM software internet access | | | | | | |
| PM software for project portfolio analysis | | | | | | |
| PM software linked with ERP | | | | | | |
| PM software for issue management | | | | | | |
| PM software for scenario analysis | | | | | | |
| PM software for cost estimating | | | | | | |