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**Critical Success Factors and Success Criteria of Construction
Projects: the case of Ethiopian Electric Power.**

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**Submitted to School of Commerce in Partial Fulfillment of MA
Degree in Project Management**

August 2017

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ACKNOWLEDGEMENTS

It has been an exciting and instructive study period in Addis Ababa University, School of Commerce and I feel privileged to have had the opportunity to carry out this study as demonstration of knowledge gained during the period of studying for my master's degree.

First and foremost, I am thankful to God for his blessings throughout my entire life. My sincere thanks to the School of Commerce for its effort to identify the knowledge gap in the practical world of project management in Ethiopia and launched such an important program which is already helping me in my professional career. I also thank my advisor Dr. Mengistu Bogale for the guidance and encouragement throughout this process.

Finally to my family, my father and my mother for your uninterrupted prayer that gave me energy and my wife Mekdes Melese, I thank you for your support and patience, that helped me to focus and concentrate my strength throughout my study period.

ABSTRACT

The study was conducted on Power Transmission, Substation and Power Generation projects undertaken by Ethiopian Electric Power. The objectives of the study were to describe the critical factors that affect success of construction projects and describe criteria for success of EEP's construction projects; and further to formulate focus areas needed to improve performance of construction projects. Both quantitative and qualitative data were used for the study; and the data for the study were collected using self-administered questionnaires having both close-ended and open-ended questions from 128 respondents from parties involved in the project implementation (project stakeholders) viz.; Client/Owner's, Consultant's, Contractor's and Sub-Contractor's project managers, construction managers, supervisors/engineers and workers. And analysis of the data was made using SPSS version 20. The study described the top ten critical success factors of EEP's construction projects: (1) Selecting inappropriate contractors, (2) Right of Way Problems, (3) Lack of top management support, (4) Absence of Sufficient or well allocated resources, (5) Poor site management and supervision, (6) Ineffective project planning and scheduling, (7) Organizational culture (decision making), (8) Commitment to project goals and objectives, (9) Delay in design approval and (10) Delay in progress payments; and further the study described criteria for success of construction projects: (i) Meeting Predetermined standards (quality), (ii) Functionality of Project outputs, (iii) On Budget Completion, (iv) Timely Completion (v) Stakeholders' acceptance and (vi) Benefits to the implementing organization. The study recommended that all project stakeholders have to pay greater attention and make their focus on factors related to them out of those described as the top ten critical success factors by prioritizing in their order of importance to bring projects to a success; that means Clients to pay higher attention on: Selecting inappropriate contractors, Right of Way Problems, Having top management support, Poor site management and supervision, Organizational culture (decision making), Commitment to project goals and objectives, and Delay in progress payments. Consultants to pay higher attention on: Selecting inappropriate contractors, Poor site management and supervision, Commitment to project goals and objectives, Delay in design approval and sub-contractor's capacity as an additional critical success factor. And Contractor have to pay higher attention on: Having top management support, Absence of Sufficient or well allocated resources, Ineffective project planning and scheduling, Commitment to project goals and objectives, and in addition the sub-contractor's capacity to as one of the main critical success factors. And further the study recommended that project stakeholders to give high attention to the order in which the six success criteria are described to determine EEP's construction projects' success.

Key words: Project Success, Critical Success Factors and Success Criteria

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ACRONYMS AND ABBREVIATIONS

ADB	African Development Bank
CRGE	Climate-Resilient Green Economy
CSFs	Critical Success Factors
EDRP	Ethiopia – Djibouti Railway Transport
EEP	Ethiopian Electric Power
EEPCO	Ethiopian Electric Power Corporation
EEU	Ethiopian Electric Utility
EHS	Environment, Health and Safety
EKPSIP	Ethiopia – Kenya Power System Interconnection Project
ETSIP	Electric Transmission System Improvement Project
GDP	Gross Domestic Product
GTP	Growth and Transformation Plan
HPP	Hydro Power Plant
HVDC	High Voltage Direct Current
ICS	Interconnected System
INDC	Intended Nationally Determined Contribution
KV	Kilo Volt
LRT	Light Railway Transport
MDG	Millennium Development Goal
MW	Mega Watt
PMBOK	Project Management Body of Knowledge
SDG	Sustainable Development Goal
TSRUP	Transmission Substation Rehabilitation and Upgrading Project
WPP	Wind Power Plant

CHAPTER ONE: INTRODUCTION

1.1. Background of the study case organization

Ethiopia has continued to post strong and inclusive economic growth. The annual real gross domestic product (GDP) growth rate has averaged 10.8% since 2004/05. In addition, the high GDP growth has been relatively inclusive, as it has uplifted about 20 million people out of poverty and facilitated the achievement of most of the Millennium Development Goals (MDGs) targets, African Development Bank (2016).

ADB (2016) in its country strategy report further states, Building on the first growth and transformation plan (GTP I), GTP II aims to transform Ethiopia into an industrialized middle-income country by 2025. This transformation will be promoted by pursuing the following three objectives: (i) maintaining an annual average real GDP growth rate of at least 11%; (ii) pursuing aggressive measures towards rapid industrialization and structural transformation; and (iii) ensuring the sustainability of growth by fostering a stable macro-economic framework and climate resilient green economy. The country is also contextualizing and mainstreaming the sustainable development goals (SDGs) into GTP II. There is a strong link among the CRGE, SDGs and GTP II, and all are closely aligned with Ethiopia's Intended Nationally Determined Contribution (INDC). Ethiopia plans to become a middle-income country by 2025. Among other things, this will entail significant investment in agricultural transformation, **energy**, transport, and improved access to quality basic services.

In the country's ambitious plan and implementation strategy, Ethiopian Electric Power (EEP) have taken the lion's share by shouldering the demanding responsibility of availing the necessary uninterrupted and stable power supply to all the local and international industries which have been constructed and yet to be constructed as attracted by the countries policy. EEP is a company born following restructuring over EEPCO since December 2013, which has come out with two distinct companies EEP and EEU. EEP which was established in 2013 by the Council of Ministers Regulation No. 302/2013 is responsible for generating, transmitting and wholesale of electricity to be utilized nationwide as well as neighboring countries. Whereas EEU is responsible of distributing and retail sale of electricity nationwide.

According to the company's yearly magazine 2016, EEP has one generation system which is Interconnected System (ICS) which consists of 13 hydropower plants, Six Diesel Standbys, One Geothermal and three wind farm power plants with installed capacity of 3,807.60 MW, 99.17 MW, 7.30 MW and 324 MW respectively which brought a total of 4,238.07 MW and expected to reach to 17,208 MW by the end of GTP II. To meet with this country's expectation, EEP is implementing more than 20 projects in both Power Generation and Power Transmission Substations construction.

1.2. Background of the study

Project is a complex, non-routine, one-time effort limited by time, budget and resource and performance specifications designed to meet customer needs. Attempts to understand the causes of project failure or success have proven problematic, despite attempt by many practitioners and academics over the years. In Ethiopia Project demands have constantly increased over the last decade and have driven the society into a constantly changing environment.

Looking into the construction industry in general, it is dynamic in nature due to the increasing uncertainties in technology, budgets, and development processes. Nowadays, construction projects are becoming much more complex and difficult. The project team is facing unprecedented changes. Moreover success criteria, success factors or a person's definition of success as it relates to a construction often changes from project to project depending on participants, scope of services, project size, sophistication of the owner related to the design of facilities, technological implications, and a variety of other factors.

Jari, Pankaj and Bhangale (2013) argues that common threads relating to success criteria often develop not only with an individual project but across the industry as they relate success to the perceptions and expectations of the owner, designer, or contractor. And they state that project success can be defined as meeting the required expectation of the stakeholders and achieving its intended purpose.

A distinction should be made between project success and project management success. They are often confused, but they are not the same. De Wit (1988) showed many examples from his research conducted in USA on some 650 completed projects and concluded that “a project can be a success despite poor project management performance and vice versa”. The study stressed that “good project management can contribute towards project success but is unlikely to be able to prevent project failure” (de Wit, 1988). Project management plays an important role in project success, but project success may be affected by many other factors outside the direct control of project management. Project management is considered successful if it satisfies the following requirements: good planning to complete the project, careful appointment of a skilled project manager, allocating sufficient time to define the project adequately, correctly planning, ensuring correct and adequate information flow, changing activities to accommodate frequent changes in reaction to project dynamics, accommodating employees’ personal goals with performance and rewards, and making a fresh start when mistakes in implementation have been identified (Munns and Bjeirmi, 1996).

Rockart (1979) developed a three step procedure for determining which factors contribute to meeting organizational goals. His study reveals that many executives tend to link in terms of “what does it take to be successful” in their business rather than in terms of purposes, objectives, and goals. Consequently the key question in this method is, “what does it take to be successful in the business?” The three main steps in the process are:

Generate critical success factors (CSFs): The key question in this step is, “what does it take to be successful in the business?”

Refine CSFs into objectives: The key question in this step is, “What should the organization’s objectives and goals be with respect to the critical success factors?”

Identify measures of performance: The key question in this step is, “How will we know whether the organization has been successful on this factor?”

Rowe, Mason and Dickel (1982) say that “Key result areas (KRAs) and critical success factors (CSFs) provide clues that help to answer the question of whether the organization is able to effectively mobilize its resources where there are conflicting sub goals, environmental uncertainty, and internal politics and constraints”.

1.3. Statement of the problem

The construction industry is one of the largest job creators in developing countries and is highly competitive. In Ethiopia according to ministry of finance and economic development (2014) report, the construction sector became the second largest job creator next to agriculture.

The Ethiopian construction sector has shown a remarkable growth and is given high prominence (MoFED, 2014). The construction sector in Ethiopia is booming and still continuing to have a leading part in the industry. The fast growth of the construction industry resulted in increase in the number of contractors joining the industry. However, several defects are being noted in the sector that need immediate action.

While individual organizations have been measuring their performance for many years, there has been little consistency in the data, and the way it has been published. The performance can be measured by key indicators for evaluation. Performance is related to many topics and factors such as time, cost, quality, client satisfaction, productivity and safety (Ahmed, Azhar, Castillo and Kappagantulla, 2002). “The definition of project success is steel ambiguous though there are consensus on the criteria to be fulfilled to say a project is successful to the minimum level” (Arti, Pankaj and Bhangale, 2013).

Considering the direct relationship between reaching projects’ objectives and the long term development of an organization, aspects regarding projects’ success and the success factors of projects are topics of great interest in project management literature. Success factors can be perceived as main variables that contribute to projects’ success (Dvir, 1998), as levers that can be operated by project managers to increase chances of obtaining the desired outcomes (Westerveld, 2003). A combination of factors determine the success or failure of a project and influencing these factors at the right time makes success more probable (Savolainen, 2012). But different studies in different countries come up with different factors that affect project success or at least have different level of affecting the success, while in Ethiopia it is very difficult to find many studies

conducted on the subject matter. And it is not easy to see Ethiopia's context of the factors for construction projects success.

Wai (2012) stated that project success is a vague concept. There is no exception in construction project success. In fact, the project success concept in the context of construction industry may be even more complicated as it involves plenty of stakeholders, possesses higher inherent risk and vulnerable to various external factors such as political and economic. Consequently, it is difficult to precisely define success of a construction project as some of the criteria are successfully met, while others are not. The researcher further highlighted that in recent years, the context-driven research on project success factors has gradually gained interest. He presented the understandings of CSFs in project management within an organizational context. However, the implication of context-driven research is limited to the countries where the data have been collected, and hence, it is recommended in the study that it would be better to have more researches to cater the nature and structure of the local construction industry.

Research is widespread with some industries, fields and sectors receiving considerable attention, while others remain largely untouched. The construction industry is an example of an embranchments which, within a distinct field, continues to build on the prior project management literature (Gert, 2014). A review of the work of Chua, et al., 1999; Hughes, et al., 2004; Chan & Chan, 2004; Shahu, et al., 2012; Elattar, 2009, indicates that the success dimensions within the construction industry both coincide (e.g. capabilities of personnel, communication, budget) and deviate (e.g. site inspections, constructability, design meetings) from those found in the general project management literature. These findings are supported by a prior study from Pinto and Covin (1989) who researched CSFs in two distinctly different areas (construction and R&D). The study indicated that while some factors appear to be common to both polar type projects (i.e. project mission and client consultation), there also exist significant differences. The factor 'personnel' for example, was perceived to be considerably more critical to the success of R&D projects than to construction projects. Seen these results, it is expected that studies in other fields will express the same outcome, indicating a need for a more project specific approach. Consequently, researchers must identify success dimensions specific to industry instead of letting project managers relying on generic critical success factor lists.

The findings strongly support the contemporary view that success criteria and critical success factors are not universal to all projects. Different projects relate to different sets of success factors, highlighting the need for future studies to focus on the domains and contingency factors not covered by current research.

Based on the aforementioned situation, the issue of project success or failure should be the center of attention for researchers in the area, operational program office of the industries and policy makers to avail fertile ground for projects to be successfully accomplished. Hence it is these research gaps especially the shortage of the studies in Ethiopia's construction industry context that initiate this study to be conducted to answer the research's main questions:

1.4. Research Questions

RQ1: What are the critical success factors that have the highest influence on success of construction projects in Ethiopia?

RQ2: What are the main criteria that determine construction projects' success?

1.5. Objective of the study

1.5.1. General Objective

The main objective of the study is to describe Critical Success Factors and Success Criteria of Construction Projects of EEP.

1.5.2. Specific Objectives

The specific objectives of this study are:

- ✓ To categorize the CSFs of construction projects. And
- ✓ To classify success criteria that help to determine construction projects' success.

1.6. Significance of the study

According to Marczyk, et al., (2005) engaging in research can be exciting and rewarding endeavor. Through research scientist attempts to answer age old questions, acquire new knowledge, describe how things work, and ultimately improve the way we all live. Therefore, any kind of research has something to add to the accumulated body of knowledge, also uses to solve particular problem.

This research provided a clear set of project critical success factors that can help project participants (Contractors, Clients, Consultant, sponsors etc.) including EEP to channel their efforts in achieving success of projects. EEP will also be benefited from the research as it helps to understand success criteria of its construction projects, for them to identify focus areas and which criteria to prioritize in case of difficulties to meet all..

Furthermore the research will also help decision makers to reconsider policies intended to implement projects. And generally as there is a shortage of literatures related to projects' critical success factors and projects' success criteria in Ethiopia, particularly in EEP's context; this study therefore, attempted to address this gap.

1.7. Delimitation of the study

Delimitation is the issue of scope of the study. It is setting the boundary for our research investigation, usually defined by its population.

Accordingly this study was confined to determining critical factors affecting construction projects' successful completion that have to be taken into consideration in order to cope with the challenges faced by construction projects and identifying success criteria of construction projects. The study was focused on construction projects of EEP.

1.8. Limitation of the study

The research, like any other research, have faced some limitations. The encountered limitations were; some respondents did not give value to the questionnaire and became reluctant to fill properly which gave the researcher a hard time in coding the data as there were inconvenient marking on the questionnaire, some did not return it totally which put the researcher under schedule pressure waiting for their answer and since most respondents have been in a tight work, some were not as such willing to fill the questionnaires that let the researcher to contact so many people to get those who accepted his request to fill the questionnaire which extended the data collection time.

1.9. Organization of the paper

In this study the researcher chose to structure the research in three phases. The first phase was a literature search covering project success criteria and project critical success factors in construction projects. The second phase was field research within Ethiopian Electric Power construction projects using a survey research questionnaire applied to project managers, construction managers, engineers and workers from the client company, consulting firm, the lead contractor and sub-contractors. The last phase was the analysis and discussion of the study results.

CHAPTER TWO: LITERATURE REVIEW

2.1. Theoretical Review

“A project is a temporary endeavor undertaken to create a unique product, service, or result” (PMI, 2013, p. 3). Project Management Institute (2013) also states, since projects are temporary in nature, the success of the project should be measured in terms of completing the project within the constraints of scope, time, cost, quality, resources, and risk as approved between the project managers and senior management.

Projects are therefore commonly used in business to achieve predefined goals and create competitive advantage. Project success is not surprisingly among the top priorities of business leaders and project stakeholders today (Müller & Jugdev, 2012). The success of projects is however influenced by many factors, it is ambiguous and can be viewed from multiple perspectives. To provide a further backbone to this study, this chapter will review the existing literature on factors attributing to project success. The review starts-off by making a clear distinction between project success criteria and project success factors. Hereafter, both topics are individually discussed.

“There are few topics in the field of project management that are so frequently discussed and yet so rarely agreed upon as that of the notion of project success” (Pinto & Slevin, 1988, p. 67). Project success is a complex and ambiguous concept. It consists of various dimensions, it is commonly confused and oversimplified, its outcome is highly dependent on by whom and when assessed, and its criteria are furthermore dependent on the context.

In order to reduce misunderstanding, a distinction should also be made between project success factors and project success criteria. According to Oxford University (2017), criterion means “a standard or principle by which something is judged, or with the help of which a decision is made”; whereas a factor is “one or several things that cause or influence something”. So, the concepts of “project success criteria” and “project success factor” are totally different but sometimes misunderstood. From this definition, a set of criteria for project success forms the basis of judging a project’s success. It includes a set of standards or principles to judge the project. On the other hand, project success factors are a set of several things that cause or influence the project outcomes. They contribute to the success or failure of project.

In the project management literature, two main concepts of project success are commonly referred to: (1) project success criteria and (2) project success factors (Müller & Jugdev, 2012). Despite these concepts being dissimilar, some literature confusingly uses the terms interchangeably as synonymous (Lim & Mohamed, 1999). In order to avoid confusion, both items are discussed here, and will remain largely separated during the subsequent theoretical exploration:

1. Project success criteria, are the set of principles, standards or measures used to judge the success or failure of a project. These are the dependent variables that measure success. Success criteria answer the question: how do you determine if a project is a successful?

2. Project success factors, are the set of circumstances, facts, or elements which, when influenced, increase the likelihood of success (Kerzner, 1987). Success factors contribute to the success or failure of a project, but do not form the basis of the judgment. Success factors are the independent variables that make success more likely. Success factors answer the question: what are the few key things that must go right for a project to be successful?

In the past Cost, Time and Quality (C. T. Q.) have been linked with measuring a projects' success. It is reasonable to believe that, if we meet the quality, time and cost targets for a project, it will be considered successful. Unfortunately, there are projects that meet all of the three targets and are yet considered failures. For example, a product that, although meets all the criteria, still has a very low commercial success! On the other end we have those projects that do not meet any of the set targets and are still considered successful. It is obvious that there is a lack of understanding concerning other criteria that may influence project success. "The only truly successful project is the one that delivers what it is supposed to, gets results, and meets stakeholder expectations" (Lewis, 2001).

Related task to a project is project management which is a task derived from an organization that enables professional project managers to use their skills, tools and knowledge to plan, execute and control a unique project within a limited lifespan by meeting the specification requirements of the organization. Since the outcomes of the capital projects have strategic implications on the success and profitability of the business, the ability to deliver based on pre-determined objectives should be critical to the company's success.

"Project success concept has been expanded to a six-dimension constructs, where additionally to the original dimensions (time, cost and quality), other important issues have been incorporated" (Matilda and Liliana, 2013). These facets are: (i) meeting the strategic goals of the client organization, (ii) achieving satisfaction of the end users, and (iii) attaining satisfaction of all other stakeholders.

In an organizational environment, projects are the way to implement strategies. Therefore, project objectives should be directly linked to strategic objectives. The effectiveness in any project is determined by how well the project contributes to the achievement of the strategic objectives of the organization. And efficiency is determined by how well the project was conducted.

Pinto & Rouhiainen (2001) as well as Kerzner (2001) add a new criterion to the triple constraint concerning the customer's satisfaction/acceptance. This is very important because this criterion turns the eyes of the company outside the organization and towards the customer. Furthermore, it enhances the specific role of the marketplace in a successful project.

According to Kerzner (2001, pg. 6), the definition of project success has been modified to include additional factors such as: Acceptance of the project by the customer/client/user, Use of the assigned resources in an effective and sufficient manner, Good customer relations, Minimum or mutually agreed upon scope changes, Undisturbed the main work flow of the organization and Respected corporate culture.

When it comes to success factors, the term critical success factor has its origins in the field of management information systems (MIS) (Gert Korbijn, 2014). “Critical success factors are the relatively small number of truly important matters on which managers should focus their attention” (Bullen & Rockart, 1981, p. 12) and these are “the few key areas where “things must go right” for the business to flourish and for the manager’s goals to be attained” (Bullen & Rockart, 1981, p. 7). Managers are generally confronted with countless tasks, and they need to decide which have priority. Through the CSF-method, critical activities are made explicit aiding the manager in his or her decision making processes. According to Rockart (1979) critical success factors are specific to the context and must be tailored to the industry, company and individual. CSFs are not static and are subject to change as the industry changes, as the company’s position changes, or as specific problems or opportunities arise.

During the early 1980s critical success factors became popular among academics and soon found their way to other fields of research (Ram & Corkindale, 2014). Although it is unclear who adopted the use and terminology first in the project management arena, critical success factors are still a vibrant school of thought today (Müller & Jugdev, 2012). Where Bullen & Rockart (1981, p. 13) comment that “CSFs will certainly differ from manager to manager according to the individual’s place in the organizations hierarchy”, the project management field seems to be more concerned with finding a universal set of critical success factors applicable to all projects.

2.2. Project Success Criterion and Project Success Factors:

Empirical review

Atkinson (1999) explains why project management has been hesitant to adopt alternative success criteria. He does this by demonstrating that two kinds of errors can arise when making an assessment. “Type I errors are made when something is done wrong, while a Type II errors occur when something has not been done as well as it could have been or something was missed” (Atkinson, 1999, p. 341). When a project is assessed using incomplete success criteria, a type II error is made. As pointed out by many scholars (Morris & Hough, 1987; Pinto & Slevin, 1988; de Wit, 1988), cost, time and quality should be used as success criteria, but not as a single dimension. Atkinson (1999) therefore suggests three additional criteria and represents them in a model. These new criteria are: success of project outcome (i.e. reliability, validity), organization benefits (i.e. improved efficiency, profits), and benefits for the stakeholder community (i.e. satisfied users, personal development). Atkinson (1999) concludes by stating that these categories are not exhaustive and merely serve to indicate the existence of other success criteria.

Projects can have a multitude of stakeholders. The contractor and client are just two who are widely acknowledged. Projects however have many other stakeholders that can have a major interest in a project's outcome. Project success may be perceived differently by different stakeholders. It is important to take the interests of these stakeholders into account as they can negatively influence a project or in a worst case even destroy it (De Wit, 1988). Once, the Dutch bank ING initiated a project as it wanted to commercially exploit personal data from their customers. The project was found to be highly controversial and received extensive negative feedback from both customers, politics and even regulatory bodies. Within a week after announcing the plan, the ING board decided to abandon the project and apologized to its clients as it had not foreseen the controversy (Munsterman, 2014). ING clearly omitted to consult their stakeholders before initiating the project, therefore not only making the project a failure, but also losing their credibility as a bank.

It is also common in projects that stakeholders have opposing success criteria. A project's success criteria are seldom identical to all affected. According to Freeman and Beale (1992, p. 8) "Success means different things to different people. An architect may consider success in terms of aesthetic appearance, an engineer in terms of technical competence, an accountant in terms of dollars spent under budget, a human resource manager in terms of employee satisfaction. Chief executive officers rate their success in the stock market". During any project it is therefore essential to identify all stakeholders and determine success from their perspective (De Wit, 1988). Endorsing the stakeholder dependent view, Lim and Mohamed (1999) propose to classify perspectives into two categories: the macro and micro viewpoints. The macro viewpoint represents the perspectives of the owner, users, and the public. They determine project success based on completion (e.g. on time delivery) and satisfaction criteria (e.g. utility and operation). On the other hand, the micro viewpoint embodies the view of the developer and contractor. Success from their perspective can be assessed by completion criteria alone. The respective set of completion criteria and corresponding factors may differ between the macro and micro viewpoints.

Shenhar, et al., 2002; Westerveld, 2003; Westerveld & Gayá Walters, 2009; Turner & Zolin, 2012 advocate a more comprehensive approach as grouping all the stakeholders into two viewpoints could result in missing the interests of some stakeholders. Westerveld (2003) and Westerveld and Gayá Walters (2009) therefore suggest that depending on the scale, complexity and further nature of a project, success can be measured by appreciation by the: client, project team, users, contractors, and other involved parties. For each of these stakeholders, the success criteria should be established and ranked according to their relevance at the beginning of the project. Based on these criteria, the project organization can be shaped and analyzed both during and post project completion. While Westerveld (2003) and Westerveld and Gayá Walters (2009) model suggests incorporating the success criteria of all stakeholders, it does not suggest that these criteria may be subject to change over time. Turner and Zolin (2012) therefore integrate these concepts into a single model, clarifying how different stakeholders rate project success over time. Each of the potentially relevant stakeholders for this study is discussed briefly using Turner and Zolin's (2012) model.

- *The project manager and project team.* A project is executed by a team of people being led by a project manager. When a project is completed, the project manager and project team are concerned with whether the result was completed on time, budget and meets the quality criteria. A further concern involves possible future career opportunities and other personal well-being related items. Shortly after project completion, their reputation and relationship become an item of concern, including whether they will receive future business. In the long-run, job security, future projects, development of new technology and competence is something they are concerned with.
- *The lead contractor.* Projects, and especially large projects are realized under the management of a lead contractor. A lead contractor may come from within the owner's organization or they may be an external managing contractor. When a project is finished, the lead contractor is concerned with whether the project was completed within time and made a sufficient profit. Both during and post project completion, the senior supplier is also interested in the safety and risk record. In order to maintain reputation and improve investor loyalty, the lead contractor will be concerned with the projects outcome and meeting performance during the operational phase. In the years following, the lead contractor will be interested in whether the project increased their chance of future work.
- *Other suppliers.* The senior supplier oversees the work of the other suppliers. These are the people or companies who provide goods, materials, or services. Directly after the project, the interests of the other suppliers will focus on getting paid on time and making a profit. In the months and years that follow, the suppliers will be concerned with their reputation and future business.
- *The owner or investor.* A project requires resources and finance, these are generally supplied by the owner or investor with an aim of recuperating the investment with a surplus at the end. At project completion, the owner will judge success based on time, budget and performance measures. Hereafter, when the project is in place, the owner will be concerned with the continuing performance of the projects outcome and its resulting profit. In the long run, the reputation of the project outcome and loyalty of customers is of interest as they continue to generate revenue. The preceding post project completion interests will continue to remain prevailing during the remaining project life cycle.
- *Consultant.* Projects, and especially large projects are realized under the management and supervision of a consultant. A consultant may come from within the owner's organization or they may be an external consulting firm. When a project is finished, the consultant is concerned with whether the project was completed as per the owner's requirement and giving the required service. In order to maintain reputation and improve investor loyalty, the consultant will be concerned with the project's outcome and meeting performance during the operational phase. In the years following, the consultant will be interested in whether the project increased their chance of future work.

When it comes to the success factors, Van der Merwe & Hauptfleisch (2012) categorized the success factors into four main groups based on the principles of management, namely Human management, Process, Organization and an additional category of Contractual and Technical based on the implementation of a construction project. In their study, they also defines project success as, achieving the success criteria (“What to achieve”) of stakeholder’s appreciation, completion on time, within cost and quality through the success factors (“How to achieve”) of human management, process, contract and technical, and organization.

SUCCESS CRITERIA	PROJECT SUCCESS	SUCCESS FACTORS	ELEMENTS OF SUCCESS FACTORS
APPRECIATION BY STAKEHOLDERS		HUMAN MANAGEMENT	<ul style="list-style-type: none"> - Team and leadership - Project manager - Communication - Stakeholder management
TIME		PROCESS	<ul style="list-style-type: none"> - Planning - Scheduling - Monitoring and Control - Quality Management - Risk Management
QUALITY		ORGANIZATION	<ul style="list-style-type: none"> - Organization structure - Financial resources - Policy and strategy - Learning Organization - External environment
COST		CONTRACT & TECHNICAL	<ul style="list-style-type: none"> - Procurement & Contract - Contractor - Technical - Innovation

Table 2.1: Success Criteria and Success Factors

Slevin and Pinto (1986), in their first major contribution developed a project management tool, named the Project Implementation Profile (PIP) and identification of ten critical success factors. These ten factors have been commonly used and cited by other researchers (i.e. Atkinson, 1999; Belassi & Tukel, 1996; Cooke-Davies, 2002) and these are: (1) project mission, (2) top management support, (3) project planning, (4) client consultation, (5) personnel, (6) technical tasks, (7) client acceptance, (8) monitoring and feedback, (9) communication and (10) trouble-shooting. While this seminal work was a good step in the right direction, Pinto and Prescott soon realized that due to the dynamics and complexities of projects, CSFs may exhibit a temporal nature. The Project Implementation Profile tool was used in a following study (Pinto & Prescott, 1988) to investigate the variation in CSFs over different project life cycle phases. Using the framework of Adams & Barndt (1978) and King & Cleland (1983) they distinguished the following phases: conceptualization, planning, execution and termination, therewith viewing a project complete when the team is decommissioned, and study the variation. The study indicated that in the conceptual phase, project mission and client consultation are the dominant CSFs. In the planning phase, this list changes to project mission, top management support and client acceptance. During the execution phase, again project mission and client consultation are critical together with trouble-shooting, scheduling and technical tasks. In the final termination phase, technical tasks, project

mission and client consultation were viewed as essential to success. The findings furthermore suggest that project mission, the initial clarity of goals and general directions, are critical across all life cycle phases. Client consultation also has an important role during a substantial part of the project life cycle. These results indicate that the relative importance of various CSFs is subject to change at different project life cycle phases. With these findings, Pinto and Prescott (1988) direct much of the confusion regarding the assessment of CSFs to their temporal nature.

On the other hand Wai (2012) highlighted that in recent years, the context-driven research on project success factors has gradually gained interest. He presented the understandings of CSFs in project management within an organizational context. However, the implication of context-driven research is limited to the countries where the data have been collected, and hence, it is recommended in the study that it would be better to have more researches to cater the nature and structure of the local construction industry.

Juliet and Ruth (2014) in their study in Niger, indicated that the most important factors agreed by the owners, consultants, and contractors as the main factors affecting the performance of construction projects in were: availability of personnel with a high experience and qualifications, quality of equipment and raw materials in project, conformance to specification, planned time for project construction, availability of resources as planned through project duration, average delay in payment from owner to contractor, information coordination between client and project parties.

Remon (2013) in his study in Egypt highlighted ninety-nine(99) factors that determine a project's success and the study pointed out the top ten(10) success factors as 1) Delay in progress payments (funding problems), 2) Different tactics patterns for bribes, 3) Shortage of equipment, 4) Ineffective project planning and scheduling, 5) Poor site management and supervision, 6) Poor financial control on site, 7) Rework due to errors, 8) Selecting inappropriate contractors, 9) Sudden failures actions and 10) Inadequate planning.

Arti, Pankaj and Bhangale (2013) in their study conducted in India, finds out ten CSFs within the project life cycle as 1) Project mission-The initial clarity of goals and the general direction, 2) Top management support-Willingness of top management to provide the necessary resources and authority/power for project success, 3)Project Schedule/Plan- A detailed specification of the individual action steps required for project implementation, 4) Client consultation-Communication, consultation, and action on behalf of all impacted parties, 5) Personnel-Recruitment, selection, and training of the necessary personnel for the project team, 6) Technical tasks-Availability of the required technology and expertise to accomplish the specific technical steps, 7) Client acceptance-The act of “selling” the final project to its ultimate intended users, 8) Monitoring and Feedback-Timely provision of comprehensive control information at each stage in the implementation process, 9) Communication-The provision of an appropriate network and necessary data to all key actors in the project implementation and 10) Trouble-Shooting-Ability to handle unexpected crises and deviations from plan.

Matilda and Liliana (2013) in their study in Bulgaria for measuring project success on the other hand, organized eleven items/success factors out of which they found out five items as the most critical success factors. Those are 1) Competence of the project manager, 2) Compliance to the rules and regulations established by the operational program, 3) Quality of subcontractor services, 4) Competence of project team members and 5) Top management support.

Morris and Hough (1987), explore the dimensions of project success through the evaluation of CSFs from eight case studies of large projects. Their study reveals that several different kinds of factors appear to contribute to project success. The primary factors identified include: (1) project objectives and their viability, (2) technical uncertainty and innovation, (3) politics, (4) community involvement, (5) schedule duration and urgency, (6) financial, legal and contractual matters, and (7) project implementation.

A comprehensive study was conducted by Fortune and White (2006), who reviewed sixty-three publications on CSFs. The CSFs identified by their study were grouped into twenty-seven CSFs and are presented in a decreasing order of citation frequency in the below table. The overview indicates that there is broad range of CSFs with only limited agreement among authors on which factors influence project success.

Nr.	Critical Success Factor	Counts	Nr.	Critical Success Factor	Counts
1	Support from senior management	39	15	Project sponsor/champion	12
2	Clear realistic objectives	31	16	Effective monitoring/control	12
3	Strong/detailed plan kept up to date	29	17	Adequate budget	11
4	Good communication/feedback	27	18	Organizational adaptation/culture/structure	10
5	User/client involvement	24	19	Good performance by suppliers	10
6	Skilled/suitably qualified/sufficient staff/team	20	20	Planned close down/acceptance of possible failure	9
7	Effective change management	19	21	Training provision	7
8	Competent project manager	19	22	Political stability	6
9	Strong business case/sound basis for project	16	23	Correct choice/of PM methodology/tools	6
10	Sufficient/well allocated resources	16	24	Environmental influences	6
11	Good leadership	15	25	Past experience (learning from)	5
12	Proven/familiar technology	14	26	Project size, level of complexity, duration	4
13	Realistic schedule	14	27	Different viewpoints (appreciating)	3
14	Risks addressed/assessed/managed	13			

Table 2.2: Critical Success Factors

CHAPTER THREE: RESEARCH METHODOLOGY

3.1. Research design

“A research design is the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure.” (Kothari, 1990). In fact, the research design is the conceptual structure within which research is conducted; it constitutes the blueprint for the collection, measurement and analysis of data. As such the design includes an outline of what the researcher will do from writing the hypothesis and its operational implications to the final analysis of data.

As Creswell (2014) states, philosophical assumptions researchers bring to the study, the types of research strategies used in the research (e.g., quantitative experiments or qualitative case studies), and the specific methods employed in conducting these strategies (e.g. Collecting data quantitatively on instruments versus collecting qualitative data through observing a setting).

Studies that establish causal relationships between variables may be termed explanatory research. The emphasis here is on studying a situation or a problem in order to explain the relationships between variables. In addition, the object of descriptive research is ‘to portray an accurate profile of persons, events or situations’. This may be an extension of, or an indication to, a piece of exploratory research or, more often, a piece of explanatory research. It is necessary to have a clear picture of the phenomena on which you wish to collect data prior to the collection of the data (Saunders, et al., 2009, p. 139).

This study adopted a descriptive research design. Descriptive research described data and characteristics about the population or phenomena being studied. Descriptive research answers the questions who, what, where, when and how (Pervez & Kjell 2005). In context, the study aimed to describe the effect of critical success factors on the successful completion of construction projects; and further describe the success criteria for the construction projects.

3.2. Research Approach

Research approaches are plans and procedures for research that span the steps from broad assumptions to detailed methods of data collection, analysis, and interpretation (Creswell, 2014, p. 43). According to Mark, et al., (2009) there are two general ways of approaching a research problem, namely the deductive and inductive approaches. The deductive approach is based on the logical way of thinking and the conclusion drawn from the theory. Thus, the deductive approach means that the research starts from already existing theories and model, from which propositions are developed and subsequently tested through empirical studies. The inductive approach means the research starts from empirical studies and these studies are subsequently related to existing theories.

On another hand, as stated by Creswell (2014) there are three research approaches: (a) qualitative, (b) quantitative, and (c) mixed methods. Unquestionably, the three approaches are not as discrete as they first appear. Qualitative and quantitative approaches should not be viewed as rigid, distinct categories, polar opposites, or dichotomies. Instead, they represent different ends on a continuum. A study tends to be more qualitative than quantitative or vice versa. Mixed methods research resides in the middle of this continuum because it incorporates elements of both qualitative and quantitative approaches (Creswell, 2014).

Based on the above description, the researcher used mixed research approach. The researcher adopted deductive approach, by referring different literatures, theories and models, which helped the researcher to develop conceptual framework and research questions. Qualitative data tends to be open-ended without predetermined responses while quantitative data usually includes close-ended responses such as found on questionnaires or psychological instruments (Creswell, 2014).

3.3. Data source and collection method

The main tools of data collection for this study were questionnaires. The questionnaire was used for data collection because it offers considerable advantages in the administration. It also presented an even stimulus potentially to large numbers of people simultaneously and provides the investigation with an easy accumulation of data. Gay (1992) maintains that questionnaires give respondents freedom to express their views or opinion and also to make suggestions.

The data were gathered for the study using questionnaire through both open-ended and close-ended questions from parties related to projects under survey located at their respective project sites and in Addis Ababa. A questionnaire with a list of twenty two (22) project success factors categorized into five major factors namely: (1) Organizational factors which include: Top management support, Delay in progress payments, Absence of Sufficient or well allocated resources and Organizational culture (decision making), (2) Project Management factors which include: Ineffective project planning and scheduling, Poor site management and supervision, Poor financial control on site, Selecting inappropriate contractors, Lack of project management competencies, Poor Scope and work definition, Significant Scope Changes and Project size (large); (3) Technical factors which include: Rework due to errors, Delay in design approval and Projects' level of complexity; (4) Environmental factors which include: Right of Way Problems, Site security condition and Political Interventions; and (5) General factors which include: Rent Seeking attitude within stakeholders, Unforeseen conditions, Poor Communication among stakeholders and Commitment to project goals and objectives was carefully designed from theoretical and empirical investigations conducted; and respondents were requested to rank the factors as per their influence to project success and they were also requested to evaluate the factor's influence on a five-point Likert scale as: one (1) Very high extent, two(2) High extent, three(3) Moderate extent, four(4) Low extent and five(5) Very low extent.

Furthermore the questioner also include six (6) possible success criterion: (1) Timely completion, (2) On budget completion, (3) Meeting Pre-determined standards, (4) Stakeholders acceptance, (5) Functionality of project outputs and (6) Benefits to the organization (efficiency, profitability, etc....) obtained from theoretical investigations conducted; and respondents were requested to rank the factors as per their influence to project success and they were also requested to evaluate the factor's influence on a five-point Likert scale as: one (1) Very high extent, two (2) High extent, three (3) Moderate extent, four (4) Low extent and five (5) Very low extent. In addition, the questioner also include open ended questions for the respondents to add what they think is crucial and not included in the list for both success criteria and critical success factors.

3.4. Sampling design

The population of the study constituted 80 project managers, 80 construction managers, 80 supervisors/engineers and 80 workers.

3.4.1. Sampling Unit

A sample was selected from parties involved in twenty projects, of which some recently completed and some currently under construction by EEP. According to the project organization of EEP's projects, one project at list constitute a client which is EEP, a consulting company, the main contractor of the construction, and the sub-contractors, a total of four parties; from each party a project manager, a construction manager/site in charge, project engineer/supervisor and a worker which is a total of 4 person were considered. That means from one project $4 \times 4 = 16$ representatives and from all twenty (20) projects $20 \times 16 = 320$ target population have been studied.

3.4.2. Sampling Technique

Using stratified random sampling method, four sectors of EEP's projects were selected in order to obtain representative sample from different sectors. Under stratified sampling the population was divided into several sub-populations that are individually more homogeneous than the total population (the different sub-populations are called 'strata'). And then the researcher selected items from each stratum to constitute a sample. Since each stratum is more homogeneous than the total population, it was possible to get more precise estimates for each stratum and by estimating more accurately each of the component parts; a better estimate of the whole were obtained from each stratum randomly using lottery method. The lottery method have given equal chance for every operator represented in the sample. The strata of the sectors were: (1) Client/Owner, (2) Consultant, (3) Contractor and (4) Sub-Contractors.

3.4.3. Sample Size

Taking the statement of Mugenda & Mugenda (2003) which states that when the target population is small (less than 1000 members), a minimum sample of more than 30% is a representative of the

whole population, and considering the other research limitations at the execution of the research and the homogeneity of the target population, a 40% sample of the target population were selected. Consequently from all strata, 128 sample respondents were selected.

3.5. Data analysis

Data was collected, examined and checked for completeness and clarity. The data collected was analyzed quantitatively. Numerical data was collected using questionnaires, they were coded and entered and analyzed using descriptive statistic assisted by Statistical Package for Social Scientists (SPSS) software 20. Frequency tables with varying percentages was used to present the findings and tables of mean and standard deviation obtained from SPSS was also used to represent the findings. Stake (1995) describes this method of data analysis as a way of analyzing data by organizing it into categories on the basis of themes and concepts. The procedure assisted in reducing and categorizing large quantity of data into more meaningful units for interpretation. Therefore the data was presented in tabular form in order to present large quantity in a meaningful for interpretation. Some mathematical computations was performed using pocket calculator.

3.6. Reliability and Validity

In developing a questionnaire, two aspects are considered very important: its validity and its reliability. According to Richardson (1999), validity can be considered as the degree to which the scores from a test relate to some criterion that is external to the test. Hayes (1995) defined reliability as the degree to which the measured result reflects the true result, i.e., the degree to which a measurement is free from the variance of random errors. Cronbach's alpha coefficient have been used in this study to investigate the reliability of the questionnaires used. Lee J. Cronbach (1951), described the alpha coefficient. This test represents an estimate of questionnaire reliability that has been applied in many studies. Given that all of the items in the questionnaire used the same measurement scale, the Alpha Co-efficient, restricted to the [0, 1] interval, was calculated from the variance of the individual items and the covariance between items.

To make operationalize, the researcher defined the variables into measurable factors, has used both qualitative and quantitative data, used pilot test, if the questionnaires administered in a real environment by respondents. For the purpose of this, 20 respondents have been asked to complete the questionnaire to identify the problem with the questions clarity. Finally, as all dimensions of the variables of the study were with a Cronbach's alpha greater than 0.70 as can be seen in the appendix-II, all have been used for analysis.

CHAPTER FOUR: DATA ANALYSIS AND FINDINGS

4.1. Introduction

In this chapter the data collected was organized into a systematic format to enable analysis. Analysis refers to examining coded data critically and making inferences while presentation refers to ways of arranging data to make it clearly understood (Kombo and Tromp, 2006). The researcher analyzed the data in line with the two objectives of the study (1) to establish critical factors affecting the successful completion of construction projects: To identify organizational factors that influence Completion of Construction Projects of EEP, To identify the Project Management factors that influences Completion of Construction Projects of EEP, To identify Technical factors that affect Completion of Construction Projects of EEP, To identify Environmental factors that affect Completion of Construction Projects of EEP and To identify General factors (common to all stakeholders) that affect Completion of Construction Projects of EEP. And (2) to determine which project success criteria determines the successful completion of construction projects.

4.2. Response Rate

Response rate refers to the number of people who participated in survey. A total of 128 questionnaires were distributed and 86 were collected having been filled completely. This constituted a response rate of (67.2%) which is adequate for analysis according to Mugenda and Mugenda (1999) that states a response rate of 50% is adequate for analysis and reporting. Table 4.1 is a summary of the response rate in this study.

Category	Frequency	Percentage
Response	86	67.2%
Not returned	42	32.8%
Total	128	100%

Table 4.1: Response Rate

4.3. Age Bracket

Age bracket in this study refers to the range between two particular ages. The researcher required the respondents to identify the age bracket for analysis. And the result of the survey is summarized in the table 4.2 below

Category	N	F	%
Below 30	86	17	19.8
31 to 49	86	49	57.0
50 and above	86	20	23.2
Total	86	86	100

Table 4.2: Age Bracket

Table 4.2 above shows that majority of the respondent are aged between 31 to 49 years representing 57 % of the respondents. This category was followed in the second position at 23.2% by those who indicated that, they aged 50 and above years. Lastly in the third position was a group of respondents whom indicated that they aged below 30 years. The majority of the workforce in these projects are in their most active and productive years.

4.4. Gender

In this study the term gender is used to refer to male or female. Respondents were asked by the researcher to give their gender as part of the moderating variable of the study.

Category	N	F	%
Male	86	73	84.9
Female	86	13	15.1
Total	86	86	100

Table 4.3: Gender

The data presented in Table 4.3 demonstrates that there was a disparity in the representation of both male and female in the survey at 84.9 % and 15.1 % respectively. This could be due to the fact that the project requires masculine and therefore engages more on manual labor. The high representation of male could be for the reason that male gender is perceived to be able to perform hard jobs which require masculine engagement, essential in the Constructions projects which the researcher believe is subject to further study.

4.5. Education Background

Information relating to the level of education attained by the respondents was also analyzed. This information would enable the researcher to determine if the employees are professional enough to understand the questions and provide reliable data to the study. In this paper respondents were asked by the researcher to give their history in terms of the academic experience.

Category	N	F	%
secondary education	86	1	1.2
Diploma	86	13	15.1
Degree	86	54	62.8
Post Graduate	86	18	20.9
Total	86	86	100

Table 4.4: Education background

Table 4.4 represents the findings on the level of education attained by the respondents. The study found out that, majority of the respondents had attained bachelor degree, this represented 62.8% of the respondents, 20.9% of the respondents had attained master’s degree. It can be observed that the projects contain staffs with various qualifications at different levels with majority having attained a bachelor degree. Some of the staff reported that some of the qualifications were yet to be attained and were currently studying especially the post graduate students. The education qualifications of the respondents suggest the availability of sufficient educational qualification to make the information acquired reliable.

4.6. Organizational success factors of Construction Projects

The respondents were asked to give their opinions on Organizational factors that affect Success of Construction Projects. The responses were measured by a five point Likert scale; **1.** Very high extent. **2.** High extent. **3.** Moderately extent **4.** Low extent **5.** Very low extent.

Factors	N	M	SD
Top management support	86	1.65	0.943
Delay in progress payments	86	2.10	1.018
Absence of Sufficient or well allocated resources	86	1.72	0.916
Organizational culture (decision making)	84	1.98	0.957

Table 4.5: Organizational success factors of Construction Projects

The study found out that top management support and Absence of Sufficient or well allocated resources affects successful completion of construction projects to a very high extent with a mean of 1.65 and 1.72 respectively; and other organizational factors: Organizational culture (decision making) and Delay in progress payment affect the successful completion of construction projects to a high extent with a mean of 1.98 and 2.10 respectively as shown in table 4.5 above.

The study result shows how important the organizational factors are in affecting the successful completion of construction projects. And the result is found to be in line with the previous research’s outcome (i.e. Remon, 2013; Arti, Pankaj and Bhangale, 2013; and Matilda and Liliana,

2013). However it is also different in the extent each of the organizational success factors affect the success of construction projects, which indicates the Ethiopian context has its own priority.

4.7. Project Management related success factors of Construction Projects

The respondents were asked to give their opinion on Project management factors that affect Success of Construction Projects. The responses were measured by a five point Likert scale; **1.** Very high extent. **2.** High extent. **3.** Moderately extent **4.** Low extent **5.** Very low extent.

Project Management Factors	N	M	SD
Ineffective project planning and scheduling	86	1.87	0.968
Poor site management and supervision	86	1.81	0.875
Poor financial control on site	86	2.24	1.116
Selecting inappropriate contractors	84	1.50	0.736
Lack of project management competencies	85	2.27	0.851
Poor Scope and work definition	86	2.37	0.995
Significant Scope Changes	86	2.35	1.071
Project size (large)	86	3.23	1.037

Table 4.6: Project Management related success factors of Construction Projects

The study found out that Selecting inappropriate contractor affects success of construction projects to a very high extent with a mean of 1.5, which the respondents categorize to be the most critical factor among the Project management factors. And this result is supported by Remon, (2013) study conducted in Egypt. But it has a slight difference in that the issue of Selecting inappropriate contractor, the most critical factor in this study was ranked eight among the top ten factors by Remon; similarly Poor site management and supervision and Ineffective project planning and scheduling affects success of construction projects to a very high extent with a mean of 1.81 and 1.87 respectively which is well supported by the prior research (e.g. Remon, 2013; Slevin and Pinto, 1986; Atkinson, 1999; Belassi & Tukel, 1996; Cooke-Davies, 2002). Other project management factors affect the success of construction projects from moderate to low extent as shown in table 4.6 above. Here it is good to note that respondents consider project size as an irrelevant factor in affecting project’s successful completion which is in line with the study of Fortune and White (2006).

4.8. Technical success factors of Construction Projects

The respondents were asked to give their opinions on Technical factors that affect Success of Construction Projects. The responses were measured by a five point Likert scale; 1. Very high extent. 2. High extent. 3. Moderately extent 4. Low extent 5. Very low extent.

Factors	N	M	SD
Rework due to errors	86	2.70	1.218
Delay in design approval	86	2.01	1.023
Projects' level of complexity	86	2.67	1.011

Table 4.7: Technical success factors of Construction Projects

The study found out that rework due to errors affects success of construction projects to a high extent with a mean of 2.01 which supports the study of Morris and Hough (1987) in which they label technical uncertainty as a critical success factor; and all other technical factors affect the success of construction projects moderately as shown in table 4.7 above.

4.9. Environmental success factors of Construction Projects

The respondents were asked to give their opinions on Environmental factors that affect Success of Construction Projects. The responses were measured by a five point Likert scale; **1.** Very high extent. **2.** High extent. **3.** Moderately extent **4.** Low extent **5.** Very low extent.

Factors	N	M	SD
Right of Way Problems	86	1.59	0.831
Site security condition	86	2.62	1.312
Political Interventions	86	2.91	1.214

Table 4.8: Environmental success factors of Construction Projects

The study found out that right of way problems affects success of construction projects to a very high extent with a mean of 1.59, however this result is not supported by other prior study to indicate ROW as the most critical success factor; and all other environmental factors affect the success of construction projects moderately as shown in table 4.8 above. In the case of political factor the study fully agree with the result from the study of Fortune and White (2006) which does not consider political factor as a critical success factor, but it disagree with that of Morris and Hough (1987) which considers the political factor among the top seven critical success factor. From this situation the researcher infers that success factors are highly influenced by the type of projects, type of industries and the country in which the study is conducted.

4.10. General success factors of Construction Projects

The respondents were asked to give their opinions on General (common to all stakeholders) factors that affect Success of Construction Projects. The responses were measured by a five point Likert scale; 1. Very high extent. 2. High extent. 3. Moderately extent 4. Low extent 5. Very low extent.

General Factors	N	M	SD
Rent Seeking attitude within stakeholders	85	2.71	1.173
Unforeseen conditions	85	3.05	0.950
Poor Communication among stakeholders	86	2.17	1.054
Commitment to project goals and objectives	86	1.98	1.051

Table 4.9: General success factors of Construction Projects

First of all these factors are termed “general factors” because of their commonalities to all project stakeholders. Here the study indicated that the commitment to project goals and objectives and poor communication among stakeholders affect success of construction projects to a high extent with a mean of 1.98 and 2.17 respectively; and it is in line with the theoretical background and supported by prior research. However other general factors especially Rent Seeking attitude within stakeholders was found in this study as a factor that affect the success of construction projects to moderate extent as opposed to prior research findings conducted in different countries and mainly in Africa(e.g. Remon, 2013).

To recap the extent to which factors affect the success of construction projects overall, the researcher ranked here under according to the factors’ mean and standard deviation values, fifteen (15) factors that affect successful completion of construction projects from moderately high extent to a very high extent as can be seen from table 4.10 below and indicated the top ten factors as critical success factors that critically affect the success of construction projects in Ethiopia.

Rank	Factors	N	M	SD
1	Selecting inappropriate contractors	84	1.50	0.736
2	Right of Way Problems	86	1.59	0.831
3	Top management support	86	1.65	0.943
4	Absence of Sufficient or well allocated resources	86	1.72	0.916
5	Poor site management and supervision	86	1.81	0.875
6	Ineffective project planning and scheduling	86	1.87	0.968
7	Organizational culture (decision making)	84	1.98	0.957
8	Commitment to project goals and objectives	86	1.98	1.051
9	Delay in design approval	86	2.01	1.023
10	Delay in progress payments	86	2.10	1.018
11	Poor Communication among stakeholders	86	2.17	1.054
12	Poor financial control on site	86	2.24	1.116
13	Lack of project management competencies	85	2.27	0.851
14	Significant Scope Changes	86	2.35	1.071
15	Poor Scope and work definition	86	2.37	0.995

Table 4.10: Summary of the top 15 factors that highly affect success of EEP projects

As can be seen from the table, it is shown that organizational factors are more dominant as it makes four out of top ten. And second project management factors that makes three out of the top ten.

Apart from these significant number of respondents indicated that the capacity of local sub-contractors is also a critical factor that affect the successful completion of construction projects, and it should be seen in parallel with the lead contractor selection.

4.11. Success Criteria of Construction Projects

The respondents were asked to give their opinions on Success Criteria that Determine Success of Construction Projects. The responses were measured by a five point Likert scale; **1.** Very high extent. **2.** High extent. **3.** Moderately extent **4.** Low extent **5.** Very low extent.

And the study result is shown below within table 4.10: Success criteria that determine Success of Construction Projects

Success Criterion	N	M	SD	Rank
Timely Completion	84	1.88	1.226	5
On Budget Completion	84	1.85	0.938	3
Meeting Predetermined standards	82	1.67	0.969	1
Stakeholders' acceptance	84	1.88	0.962	4
Functionality of Project outputs	84	1.68	0.838	2
Benefits to the organization (like efficiency, profitability ...etc.)	84	2.13	0.818	6

Table 4.11: Success criterion that determine Success of Construction Projects

The study found out that Meeting Predetermined standards and Functionality of the projects' outputs are the main success criteria that determine the success of construction projects to a very high extent with a mean of 1.67 and 1.68 respectively; similarly the study shows that other criterion viz. On budget completion, Timely completion, Stakeholders' acceptance and Benefits to the organization determines the success of construction projects to a high extent as shown in table 4.9 above.

In addition to the project success criterion listed in the provided questionnaire, significant number of respondents indicated that Projects' Environmental, Health and Safety (EHS) record and Project's capacity in job opportunity creation have to be in the key project success criteria for construction projects.

CHAPTER FIVE: DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

5.1. Introduction

This chapter presents a summary of the study findings, discussions, conclusions and recommendations. It also makes suggestions for further research. The findings are summarized in line with the objectives of the study which was to determine the Critical Success Factors and Success Criteria of Construction Projects of Ethiopian Electric Power.

5.2. Conclusion and Discussion

This research described the critical success factors and success criteria of construction projects, with the objective to build relevant theory in the Ethiopian construction industry, specifically in EEP's context. In order to realize this objective, this study relies on multiple sources of evidence (i.e. document reviews and questionnaire survey) to develop concepts, study their relation and derive propositions.

As a result this study makes several contributions to literature.

First of all, the study identified the critical success factors of construction projects. The results of this study suggest that the following ten factors critically affect the success of construction projects: (1) Selecting inappropriate contractors, (2) Right of Way Problems, (3) Lack of top management support, (4) Absence of Sufficient or well allocated resources, (5) Poor site management and supervision, (6) Ineffective project planning and scheduling, (7) Organizational culture (decision making), (8) Lack of commitment to project goals and objectives, (9) Delay in design approval and (10) Delay in progress payments. The factors identified by this study correspond with those found in prior research, but suggests that some of the identified success factors (the likes of right of way problems) are exclusively highly important to the context of construction projects in Ethiopia. And their effect and its extent discussed as follows:

Selecting inappropriate contractors: most the respondents identified the “inappropriate contractor selection” as the main factor to affect the success of construction projects of Ethiopian Electric power. As the dominant types of contracts implemented in EEP are Engineering and Procurement Contract (EPC) and Turn Key contracts which give the lead contractor the highest authority and responsibility, if the contractor fail, it will be very difficult to save the project from failure or at least to make it successfully completed. So the study result clearly shows the actual situation within EEP and indicates the importance of working hard in contractor selection (e.g. bid evaluation, contract negotiation, etc...)

Right of Way Problems: different from other previous research, respondents make the ROW problem the second most critical factor that highly affect the success of construction projects. As the power infrastructure requires a significant amount of land which most of the time is owned by individuals who made their living from it; the study shows how the growing power infrastructure

projects are getting affected by the issue of Row. This result can be considered as the evidence why the Ethiopian government recently established Federal Integrated Infrastructure Development Coordination Agency (FIIDCA).

Top management support: As the definition indicates “A project is a temporary endeavor undertaken to create a unique product, service, or result” (PMI, 2013) and to deliver this unique output the project manager and project team need to be very flexible and responsive to the changing project environment. It is clear that the project manager and the team can't do so without full support from the top management of the company. In line with these, respondents ranked top management support the third most critical factor that affect the successful completion of construction projects.

Absence of Sufficient or well allocated resources: the study identified that for the project to be successfully completed, there should be adequately available or if there is a shortage, the available resource should be well allocated for maximum efficiency. So the study result is well in line with the governing theories of project management.

Poor site management and supervision: the study indicated that whatsoever effort made, if the construction site is not well managed and supervised to insure that things are on truck, it will be very difficult to see a construction project succeed.

Ineffective project planning and scheduling: in line with the theoretical background, the study identified that failure to effectively plan and schedule project activities will have high probability of leading to project failure; by indicating that ineffective project planning and scheduling affects the success of construction projects to a high extent.

Organizational culture (decision making): unlike the previous research undertaken by the likes of Fortune and White (2006), organizational decision making procedure have taken greater attention by the respondents for this study. It identified that organizational culture, especially the way/level at which the organization takes decision is one of the top ten critical factors that affect success of construction projects.

Commitment to project goals and objectives: as stated above under the explanation for the top management support, the project by nature requires everyone's attention as its environment is unpredictable and need immediate response to the changing environment. This is not possible unless every stakeholder is committed to bring the project success. The study indicated the same as it ranked the “commitment to project goals and objectives” in the top ten critical success factors.

Delay in design approval: in the three-party system of construction project implementation, the inputs from the consultant is significant especially in design approval as nothing will be implemented unless the engineer approved its design. The study finding is then in line with the theoretical framework.

Delay in progress payments: in construction project environment a positive cash flow situation is very important, but it is sometimes misunderstood especially from the client side. A contractor could be profitable on the project as a whole, but if it didn't get cash continuously it will be difficult for the contractor to meet the cash demanding project situation which affects the project's success.

And the study finding here is also in line with the theoretical framework and previous research as it categorized the delay in progress payment as one of the top ten critical success factor for construction projects.

Further, the study identified the success criteria that determine construction projects' success, during the post project completion phase. The results of this research suggest, that the perceived success of Construction projects can be determined by evaluating performance against the dimensions: (1) Meeting predetermined standards (quality): a project by its definition is an endeavor implemented to produce a unique output, and for this project to be termed a success it has to produce that unique output which was set before the start of the project implementation. And the study result fully agree with this theoretical background, (2), Functionality of project outputs: if a project output does not deliver what it is intended for, there is no point in doing the project (Lewis, 2001). The current study result strongly reinforces the prior research as it ranked "Functionality of Project outputs" the second most determinant of Project success, (3) Budget Spent: this criterion is one of the oldest measures and yet used to determine project success and the current study result fully in line with the results of prior research, (4), Stakeholders satisfaction: if a project result is not liked/accepted by the stakeholders (especially owners), it cannot be termed successful as it is done to satisfy the customers' need which it is designed for. And the result also shows that the acceptance of stakeholders is a key factor in determining the project success, (5) lead time: similar to the budget for the project, it is always important factor but its level here shows that it is the fifth important criteria which agrees with the contemporary studies' view of project success criteria, (6) Benefits the implementing organization gains from the project: when an organization implement a project, it is either to solve its current problems or to be a better player in the market. And the study result fully support the theoretical propositions and the contemporary empirical evidences.

All the aforementioned six success criteria have been identified by prior research, however this study is believed to be the first to explicitly relate the prior set of criteria to a distinct category of projects, namely Power Transmission, Substation and Power Generation Construction projects. This study finding confirmed that project success is beyond meeting the golden triangle (meeting cost, time and quality requirement) and it is a multidimensional concept and therewith corroborates with prior research (Wateridge, 1998; Baccarini, 1999; Cooke-Davies, 2002).

In addition, the study result also identified project's Environment, Health and Safety record and project's capacity to create a job opportunity to the public as another set of criterion to determine the projects' success. As stated by MoFED (2014), the construction industry is currently the largest job creator in Ethiopia next to Agriculture, which is well in line with this study result though it is something to be investigated further.

Finally although this study does not contribute by identifying new success factors and success criteria, it does however provide evidence supporting a set of success factors critical to a specific type of projects and a set of success criteria that determines industry specific projects' success.

5.3. Recommendations

Based on the findings, the study recommended that all project stake holders to pay greater attention in influencing the top ten critical success factors described in the right way and at the right time to increase the likelihood of project success.

The study critically recommend that the project stakeholders need to pay attention on their respective issues related to them in their order of importance namely:

Clients to pay higher attention on:

- (1) Selecting inappropriate contractors,
- (2) Right of Way Problems,
- (3) Having top management support,
- (4) Poor site management and supervision,
- (5) Organizational culture (decision making),
- (6) Commitment to project goals and objectives,
- (7) Delay in progress payments.

Consultants to pay higher attention on

- (1) Selecting inappropriate contractors,
- (2) Poor site management and supervision,
- (3) Commitment to project goals and objectives,
- (4) Delay in design approval and sub-contractor's capacity as an additional critical success factor

Contractor to pay higher attention on:

- (1) Having top management support,
- (2) Absence of Sufficient or well allocated resources,
- (3) Ineffective project planning and scheduling,
- (4) Commitment to project goals and objectives, and in addition the sub-contractor's capacity to make up the critical success factors list.

Furthermore the study suggests that the project stakeholders to focus in meeting the described success criteria in their order of importance to achieve success of construction projects: (1) Meeting Predetermined standards (quality), (2) Functionality of Project outputs, (3) On Budget Completion, (4) Timely Completion (5) Stakeholders' acceptance and (6) Benefits to the implementing organization.

Finally, this study provides various propositions for future research to test and refine.

5.4. Recommendations for Future research

The findings from this study may be a good starting point for further research on the success of construction projects. The propositions may be tested and replicated in alike or other industries to enhance robustness and generalizability of theory. It is however recommended to assess the availability of reliable data sources at the beginning of the study, to avoid introducing bias to the research.

In addition future research may also consider studying project success over different time frames, especially focusing on the project execution and later post completion phases. This study was restricted to the perspective of infrastructure development construction project success. Other studies could contribute by incorporating the perspective of alternative project types.

Furthermore in the present study, Project's Environment, Health and Safety record and projects' capacity in creation of job opportunity emerged as a success criterion for construction projects. The criterion was forwarded by number of respondents, but did not exhibit opinion from all respondents as it was not included in the list of criterion by the researcher. Future research could study this criteria by incorporating all respondents' opinion.

Finally this study observed that construction industries are dominated by male employees, as seen in the demographic survey result indicated in table 4.3 Gender, which shows 85% of the surveyed employees are male. The researcher believed that this result of male dominance is a point future studies should take into consideration to identify the rationale behind this fact.

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APPENDICES

Appendix I: Cover Letter

WUDINEH YEMANE,
Addis Ababa University,
School of Commerce
Addis Ababa
June 2015

Subject: Data Collection

Dear Sir/Madam

My name is Wudineh Yemane, I am a Master's student at Addis Ababa University, School of Commerce, Department of Project Management. One of the requirements for Master's Degree study before graduating is to undertake a thesis and for this I have chosen the research topic **"CRITICAL SUCCESS FACTORS AND SUCCESS CRITERIA OF CONSTRUCTION PROJECTS: THE CASE OF ETHIOPIAN ELECTRIC POWER"**. This research project is to be undertaken as an attempt to identify the factors that affect construction projects' successful completion and the criterion by which the success will be measured. The result of the study will assist project managers, sponsors and other decision makers related to projects to channel their effort to the issues that have biggest influence on projects' success.

As you are selected to form part of the study, this is to kindly request you to assist me collect the data by responding to the questions in the attached questioner.

Best Regards!

Appendix II: Questionnaire

Questionnaire for Data Collection

The information provided will only be used for the purpose of this study. Please Read carefully and give appropriate answers by ticking or filling the blank spaces. The information will be treated with maximum confidentiality.

SECTION A: GENERAL INFORMATION

1. Indicate your age

Below 30 [] 31 to 49 [] 50 and above []

2. Indicate your gender

Male [] Female []

3. Indicate your educational level

Secondary education [] Diploma [] Degree [] Post Graduate []

4. Indicate your company's responsibility in the project

Client [] Consultant [] Contractor [] Subcontractor []

5. Indicate your position in the company

Project Manager [] Construction Manager [] Project Engineer [] Worker []

SECTION B: CRITICAL FACTORS AFFECTING SUCCESSFUL COMPLETION OF CONSTRUCTION PROJECTS

Using a scale 1-5, Please tick (√) as appropriate. 1. Very high extent, 2. High extent, 3. Moderate extent, 4. Low extent, 5. Very low extent.

6. To what extent do you consider the following factors affect Construction Projects' Successful Completion in Ethiopia? How do you rank each ones influence with respect to others?

Sl. No.	Statement	1	2	3	4	5	Rank
Organizational Factors							
1	Top management support						
2	Delay in progress payments						
3	Absence of Sufficient or well allocated resources						
4	Organizational culture (decision making)						

Project Management Factors							
5	Ineffective project planning and scheduling						
6	Poor site management and supervision						
7	Poor financial control on site						
8	Selecting inappropriate contractors						
9	Lack of project management competencies						
10	Poor Scope and work definition						
11	Significant Scope Changes						
12	Project size (large)						
Technical Factors							
13	Rework due to errors						
14	Delay in design approval						
15	Projects' level of complexity						
Environmental Factors							
16	Right of Way Problems						
17	Site security condition						
18	Political Interventions						
General Factors							
19	Rent Seeking attitude within stakeholders						
20	Unforeseen conditions						
21	Poor Communication among stakeholders						
22	Commitment to project goals and objectives						

7. What other factors do you think influence the construction project's successful completion? Please list as many factors as you have.

- i. _____
- ii. _____
- iii. _____
- iv. _____
- v. _____

SECTION C: CONSTRUCTION PROJECTS' SUCCESS CRITERION

Using a scale 1-5, Please tick (√) as appropriate. 1. Very high extent, 2. High extent, 3. Moderate extent, 4. Low extent, and 5. Very low extent.

8. To what extent do you consider the following criterion determine Construction Projects' Successful Completion in Ethiopia? How do you rank each ones importance with respect to others?

Sl. No.	Statement	1	2	3	4	5	Rank
1	Timely Completion						
2	On Budget Completion						
3	Meeting Predetermined standards						
4	Stakeholders' acceptance						
5	Functionality of Project outputs						
6	Benefits to the organization (like efficiency, profitability ...etc.)						

9. What other criterion do you think determine the construction project's success? Please list as many factors as you have.

- i. _____
- ii. _____
- iii. _____
- iv. _____
- v. _____

Appendix III: Reliability Test Result

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.851	.847	28

Appendix IV: Frequency Table-1, General Information

Age

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Below 30	17	19.8	19.8
	31 to 49	49	57.0	76.7
	50 and above	20	23.3	100.0
	Total	86	100.0	100.0

Gender

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	71	82.6	82.6
	Female	13	15.1	97.7
	11	2	2.3	100.0
	Total	86	100.0	100.0

Educational Level

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Secondary Education	1	1.2	1.2
	Diploma	13	15.1	16.3
	Degree	54	62.8	79.1
	Postgraduate	18	20.9	100.0
	Total	86	100.0	100.0

Company's Responsibility

	Frequency	Percent	Valid Percent	Cumulative Percent
Client	24	27.9	27.9	27.9
Consultant	20	23.3	23.3	51.2
Valid Contractor	22	25.6	25.6	76.7
Sub-Contractor	20	23.3	23.3	100.0
Total	86	100.0	100.0	

Position in the company

	Frequency	Percent	Valid Percent	Cumulative Percent
Project Manager	24	27.9	27.9	27.9
Construction Manager	16	18.6	18.6	46.5
Valid Project Engineer	33	38.4	38.4	84.9
Worker	13	15.1	15.1	100.0
Total	86	100.0	100.0	

Appendix V: Frequency Table-2, Project Success Factors

Top management support

	Frequency	Percent	Valid Percent	Cumulative Percent
Very high extent	51	59.3	59.3	59.3
High extent	21	24.4	24.4	83.7
Valid Moderate extent	7	8.1	8.1	91.9
Low extent	7	8.1	8.1	100.0
Total	86	100.0	100.0	

Delay in progress payments

	Frequency	Percent	Valid Percent	Cumulative Percent
Very high extent	32	37.2	37.2	37.2
High extent	21	24.4	24.4	61.6
Valid Moderate extent	25	29.1	29.1	90.7
Low extent	8	9.3	9.3	100.0
Total	86	100.0	100.0	

Absence of Sufficient or well allocated resources

	Frequency	Percent	Valid Percent	Cumulative Percent
Very high extent	44	51.2	51.2	51.2
High extent	28	32.6	32.6	83.7
Valid Moderate extent	9	10.5	10.5	94.2
Low extent	4	4.7	4.7	98.8
Very low extent	1	1.2	1.2	100.0
Total	86	100.0	100.0	

Organizational culture (decision making)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very high extent	30	34.9	35.7	35.7
	High extent	34	39.5	40.5	76.2
	Moderate extent	13	15.1	15.5	91.7
	Low extent	6	7.0	7.1	98.8
	Very low extent	1	1.2	1.2	100.0
	Total	84	97.7	100.0	
Missing	System	2	2.3		
Total		86	100.0		

Ineffective project planning and scheduling

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very high extent	35	40.7	40.7	40.7
	High extent	35	40.7	40.7	81.4
	Moderate extent	11	12.8	12.8	94.2
	Low extent	2	2.3	2.3	96.5
	Very low extent	3	3.5	3.5	100.0
	Total	86	100.0	100.0	

Poor site management and supervision

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very high extent	39	45.3	45.3	45.3
	High extent	27	31.4	31.4	76.7
	Moderate extent	17	19.8	19.8	96.5
	Low extent	3	3.5	3.5	100.0
	Total	86	100.0	100.0	

Poor Financial Control

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very high extent	24	27.9	27.9	27.9
	High extent	33	38.4	38.4	66.3
	Moderate extent	18	20.9	20.9	87.2
	Low extent	6	7.0	7.0	94.2
	Very low extent	5	5.8	5.8	100.0
	Total	86	100.0	100.0	

Selecting inappropriate contractors

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very high extent	53	61.6	63.1	63.1
	High extent	21	24.4	25.0	88.1
	Moderate extent	9	10.5	10.7	98.8
	Low extent	1	1.2	1.2	100.0
	Total	84	97.7	100.0	
Missing	System	2	2.3		
Total		86	100.0		

Lack of project management competencies

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very high extent	13	15.1	15.3	15.3
	High extent	43	50.0	50.6	65.9
	Moderate extent	24	27.9	28.2	94.1
	Low extent	3	3.5	3.5	97.6
	Very low extent	2	2.3	2.4	100.0
	Total	85	98.8	100.0	
Missing	System	1	1.2		
Total		86	100.0		

Poor Scope and work definition

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very high extent	16	18.6	18.6	18.6
	High extent	33	38.4	38.4	57.0
	Moderate extent	31	36.0	36.0	93.0
	Low extent	1	1.2	1.2	94.2
	Very low extent	5	5.8	5.8	100.0
	Total	86	100.0	100.0	

Significant Scope Changes

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very high extent	20	23.3	23.3	23.3
	High extent	32	37.2	37.2	60.5
	Moderate extent	21	24.4	24.4	84.9
	Low extent	10	11.6	11.6	96.5
	Very low extent	3	3.5	3.5	100.0
	Total	86	100.0	100.0	

Project size (large)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very high extent	6	7.0	7.0	7.0
	High extent	9	10.5	10.5	17.4
	Moderate extent	41	47.7	47.7	65.1
	Low extent	19	22.1	22.1	87.2
	Very low extent	11	12.8	12.8	100.0
	Total	86	100.0	100.0	

Rework due to errors

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very high extent	12	14.0	14.0	14.0
	High extent	34	39.5	39.5	53.5
	Moderate extent	18	20.9	20.9	74.4
	Low extent	12	14.0	14.0	88.4
	Very low extent	10	11.6	11.6	100.0
	Total	86	100.0	100.0	

Delay in design approval

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very high extent	30	34.9	34.9	34.9
	High extent	36	41.9	41.9	76.7
	Moderate extent	12	14.0	14.0	90.7
	Low extent	5	5.8	5.8	96.5
	Very low extent	3	3.5	3.5	100.0
	Total	86	100.0	100.0	

Projects' level of complexity

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very high extent	13	15.1	15.1	15.1
	High extent	19	22.1	22.1	37.2
	Moderate extent	41	47.7	47.7	84.9
	Low extent	9	10.5	10.5	95.3
	Very low extent	4	4.7	4.7	100.0
	Total	86	100.0	100.0	

Right of Way Problems

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very high extent	48	55.8	55.8	55.8
	High extent	30	34.9	34.9	90.7
	Moderate extent	4	4.7	4.7	95.3
	Low extent	3	3.5	3.5	98.8
	Very low extent	1	1.2	1.2	100.0
	Total	86	100.0	100.0	

Political Interventions

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very high extent	18	20.9	20.9	20.9
	High extent	7	8.1	8.1	29.1
	Moderate extent	32	37.2	37.2	66.3
	Low extent	23	26.7	26.7	93.0
	Very low extent	6	7.0	7.0	100.0
	Total	86	100.0	100.0	

Rent Seeking attitude within stakeholders

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very high extent	20	23.3	23.5	23.5
	High extent	12	14.0	14.1	37.6
	Moderate extent	28	32.6	32.9	70.6
	Low extent	23	26.7	27.1	97.6
	Very low extent	2	2.3	2.4	100.0
	Total	85	98.8	100.0	
Missing	System	1	1.2		
Total		86	100.0		

Unforeseen conditions

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very high extent	3	3.5	3.5	3.5
	High extent	20	23.3	23.5	27.1
	Moderate extent	39	45.3	45.9	72.9
	Low extent	16	18.6	18.8	91.8
	Very low extent	7	8.1	8.2	100.0
	Total	85	98.8	100.0	
Missing	System	1	1.2		
Total		86	100.0		

Poor Communication among stakeholders

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very high extent	27	31.4	31.4	31.4
	High extent	29	33.7	33.7	65.1
	Moderate extent	20	23.3	23.3	88.4
	Low extent	8	9.3	9.3	97.7
	Very low extent	2	2.3	2.3	100.0
	Total	86	100.0	100.0	

Commitment to project goals and objectives

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very high extent	33	38.4	38.4	38.4
	High extent	34	39.5	39.5	77.9
	Moderate extent	10	11.6	11.6	89.5
	Low extent	6	7.0	7.0	96.5
	Very low extent	3	3.5	3.5	100.0
	Total	86	100.0	100.0	

Appendix VI: Frequency Table-3, Project Success Criterion

Timely Completion

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very high extent	44	51.2	52.4	52.4
	High extent	23	26.7	27.4	79.8
	Moderate extent	7	8.1	8.3	88.1
	Low extent	3	3.5	3.6	91.7
	Very low extent	7	8.1	8.3	100.0
	Total	84	97.7	100.0	
Missing	System	2	2.3		
Total		86	100.0		

On Budget Completion

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very high extent	38	44.2	45.2	45.2
	High extent	27	31.4	32.1	77.4
	Moderate extent	13	15.1	15.5	92.9
	Low extent	6	7.0	7.1	100.0
	Total	84	97.7	100.0	
Missing	System	2	2.3		
Total		86	100.0		

Meeting Predetermined standards

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very high extent	47	54.7	57.3	57.3
	High extent	23	26.7	28.0	85.4
	Moderate extent	5	5.8	6.1	91.5
	Low extent	6	7.0	7.3	98.8
	Very low extent	1	1.2	1.2	100.0
	Total	82	95.3	100.0	
Missing	System	4	4.7		
Total		86	100.0		

Stakeholders' acceptance

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very high extent	38	44.2	45.2	45.2
	High extent	23	26.7	27.4	72.6
	Moderate extent	19	22.1	22.6	95.2
	Low extent	3	3.5	3.6	98.8
	Very low extent	1	1.2	1.2	100.0
Total		84	97.7	100.0	
Missing	System	2	2.3		
Total		86	100.0		

Functionality of Project outputs

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very high extent	44	51.2	52.4	52.4
	High extent	26	30.2	31.0	83.3
	Moderate extent	11	12.8	13.1	96.4
	Low extent	3	3.5	3.6	100.0
	Total	84	97.7	100.0	
Missing	System	2	2.3		
Total		86	100.0		

Benefits to the organization (like efficiency, profitability ...etc.)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very high extent	21	24.4	25.0	25.0
	High extent	33	38.4	39.3	64.3
	Moderate extent	28	32.6	33.3	97.6
	Low extent	2	2.3	2.4	100.0
	Total	84	97.7	100.0	
Missing	System	2	2.3		
Total		86	100.0		