DETERMINANTS OF CONSTRUCTION PROJECTS' SUCCESS IN CONSTRUCTION INDUSTRY OF ADAMA CITY ADMINISTRATION

THESIS SUBMITTED TO SCHOOL OF GRADUATE STUDIES OF HARAMBEE UNIVERSITY IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF PROJECT MANAGEMENT

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By: - Jemal Kedir Shuka

Advisor: - Mulachew Haile (RS)

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Adama, Ethiopia

Declaration

I, the undersigned, declare that the thesis entitled **"determinants of construction projects success in construction industry of Adama city administration"** is my original work. This thesis has not been presented for any other university, it is not submitted for any other, and that all sources of materials used for the thesis have been duly acknowledged.

Name: - Jemal Kedir Shuka

Signature: - _____

Date: July 31, 2022

Confirmation

I confirm that Jemal Kedir carried out the thesis entitled "**determinants of construction projects success in construction industry of Adama city administration**" under my advisor ship. This work is suitable for submission for defense as a partial fulfillment requirement for the award of master's degree in Project Management

Name: - Mulachew Haile (RS)

Signature: - _____

Date: July 31, 2022

Examiners Approval

We, the undersigned, members of the Board of Examiners of the thesis done by Jemal Kedir Shuka have read and evaluated the thesis entitled “Determinants of construction projects success in construction industry of Adama city administration” and examined the candidate during open defense. This is, therefore, to certify that the thesis is accepted for partial fulfillment of the requirement of the degree of Master of Project Management.

Approved By Board Of Examiners:

_____	_____	_____
Internal Examiner	Signature	Date
_____	_____	_____
External Examiner	Signature	Date

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Acronyms

SPSS	Statistical Package For Social Sciences
CSF	Critical Success Factors
ACA.	Adama City Administration
BRB	Building, Road and Bridge

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Abstract

Construction industry is a huge and crucial segment having a significant role in economic development of any country. It has a very important contribution in helping one country's development and other sectors are dependent on it by one or other means. Having such a great contribution, construction projects are facing time and cost overruns, quality problems and scope variations which leads to project failure. Descriptive type of research was used and both primary and secondary data sources were used for the study. Both qualitative and quantitative research approach were adopted and stratified sampling technique was used. The purpose of this research was to investigate determinants of construction projects success in construction industry for the case of Adama city administration. The data collection was conducted using questionnaire. 80 questionnaires were distributed to 20 contractors, 16 clients, 24 consultants and 20 regulatory bodies. From 80 questionnaires, 54 questionnaires were returned back and analyzed by RII method and mean score using SPSS software. From 12 identified construction projects success factors; leadership skills and competency of project manager, detailed project planning, estimation and scheduling, project team motivation, coordination, and commitment to project goals, project manager technical capabilities and experiences, health and safety program implementation and setting of clear objectives and scope are the most significant success factors which determine success of construction projects. Accordingly, Adama city administration should give enough attention and should manage identified determinant success factors properly so they can have a positive influence on the success of construction industry.

***Keywords**: Critical Success Factors, Project Success, Success Criteria,*

Chapter One

1. Introduction

1.1 Background of the Study

Construction sector is considered one of the main sources of nation's economy, country development and significant to achievement of nations' socio-economic development goals through providing basic development infrastructure related to health, transport as well as education sector. The construction industry plays a significant role in producing wealth and providing a better quality of life to the nation that is essential to development of the nation (Waseem Alshami, 2018). The future of the global construction industry looks good with opportunities in residential, nonresidential, and infrastructure. The global construction industry is expected to reach an estimated $10.5 trillion by 2023, and it is forecasted to grow at a CAGR of 4.2% from 2018 to 2023. The major drivers for the growth of this market are increasing housing starts and rising infrastructure due to the increasing urbanization and the growing population. About one-tenth of the global economy is dedicated to constructing and operating homes and offices. Construction industry consumes one-sixth to one-half of the world's wood, minerals, water and energy (Global Construction Industry Report 2021).

Construction industry is a sector, which have very huge amount of human resources. It creates employment opportunities both for skilled and unskilled workers. Though it provides temporary employment, many unskilled labors are benefited from this sector including women. Similar to all other socio-economic activities, construction industry is source of revenue for government. Government generates revenue from construction industry form corporate companies' income taxes, sales tax, rental income, capital gain tax and employees' income tax from those employed in construction sector which in turns goes for financing of public services such as school and health institutions among others (Yada and Yadata, 2016).

The African construction industry is the target destination for largest economies. This is because of accruing benefits and/or advantages such as availability of huge natural resources, huge investment opportunities in energy and infrastructure, cheap labor, and a fast-growing consumer market. Also, there is a beneficial business environment that includes favourable economic development policies and rising commodity prices in addition to continued progress in the fight against corruption and the adoption of democratic governments.

The Africa construction market was valued at around USD 5.4 billion in 2020 and is expected to register a CAGR of 7.4% during the forecast period (2021 – 2026) (Africa Construction market report 2021). Ethiopia's construction sector is one of the most robust in Africa. The construction industry of Ethiopia as in other parts of the world, is huge and a crucial segment in economic development. It is playing a vital role in increasing its national GDP. According to African Economic Outlook 2015 edition, construction industry of Ethiopia contributes 9.4% to a total GDP of a country. It is contributing a very significant contribution for socio-economic development of the country as it directly or indirectly effects all other economic sectors and activities. Investment developments and expansion of various infrastructure projects like roads, airports, schools, health institution, and residential and non-residential buildings is increasing at high rate from time to time in Ethiopia. Though it is very important and crucial sector in supporting one's country development, there are some challenges being faced in reaching its intended purpose. Project delays, time overruns, quality problems and scope variations are main hindrances of construction industry's project success (Bilen Abera, 2019).

Adama is located 100km to the south east of Addis Ababa. It was founded in 1915 as an urban settlement while building the railway from Addis Ababa to Djibouti. The historical name of Adama was derived from a wild plant of the surrounding areas called Adaamii (cactus) tree. During the regime of king Hailesillaissei in the year 1916 its original name was change to Nazareth. However, as it is proclaimed by Oromia regional state in the year 1992, its name has been changed to its original name, Adama. Adama is situated 1600-1700 meters above sea level and in a Latitude from 8^{o} 33.8N to 8^{o} 36N and a Longitude from 39_{0} 11‟ 57E to 39021‟15E in the rift valley of warm climate. The coverage area of the city is expanding from the beginning time as many people are coming to it either for employment or business purpose.

Central Statistical Agency of Ethiopia, 2007 Population and Housing Census result shows that the city has an estimated total population of 222,035 of whom 109,659 were males and were 112,376 females. The national census of 1994 reports total population of the city to be 127,842 of whom 61,965 were males and 65,877 were females. This shows that the population of the city has grown at 74 percent (Yosef Taye, 2019). Adama is one the most rapidly urbanizing cities in Ethiopia. It is the second most populous city in Ethiopia and one of the fastest growing cities in the country. It is the largest city in Oromia region, which features industries and manufacturing enterprises, and is strategically located on the main road linking Addis Ababa to Djibouti. An individual or any group joining Adama, and development being undertaken cannot stand-alone and will be meaningless unless construction activities are involved.

Construction of residential, commercial, or administrative building, roads and bridges, schools, public toilets and health institutions are some of construction works undertaken by Adama city administration.

1.2 Statement of the Problem

Projects differ in variety of ways such as size, uniqueness and complexity and this leads to state that the criteria for determining project success should vary from project to project and hence it would be difficult to have a unique set of criteria for all projects in all industries (Zakari Tsiga, Michael Emes, Alan Smith, 2016). Though efforts have been made to identify success factors of construction projects, there is no general agreement on these factors (Silva, 2016). Previous researchers have identified different project success factors. Some of them have identified and analyzed determinant factors of project success (any type of project) and some of them have done in determining success factors of construction projects.

It is obvious that a project can be said successful project if it fulfills to the minimum the three basic criteria used to determine project success. And these criteria are time, cost and quality. Ethiopian construction industry is failing to meet these criteria (Bilen Abera, 2019). Similar to other construction activities undertaken in Ethiopia, it has been observed that some of construction projects executed under Adama city administration is facing challenges of hitting and achieving the predetermined targets and goals. And the reason behind these problems should be dug out and determinant factors, which contribute for construction projects success, should be identified. Many researchers have worked earlier on CSFs, which are determinants of projects success. They found many essential details that could benefit other researchers. However, few studies have worked on the construction industries with regard to determinants of construction projects success.

Therefore, identifying determinant factors, which contribute for success of construction projects, is essential especially, in our country, Ethiopia. And this paper intends in contributing its findings in this area by identifying determinant factors of construction projects success in construction industry of Adama city Administration.

In the light of the above discussion, this research tried to address the following questions.

- What is the level of success of projects in construction industry of ACA?
- How important are success factors in construction industry of ACA?
- What are the major success factors in construction industry of ACA?

1.3 Objective of the Study

1.3.1 General Objective

The general objective of this research is to study determinant success factors of projects in construction industry of ACA.

1.3.2 Specific Objectives

- To investigate the level of success of projects in construction industry of ACA.
- To rank the success factors based on their relative importance index.
- To identify major success factors in construction industry of ACA.

1.4 Significance of the Study

There are several valuable benefits expected by implementing findings of this study The study has the following significance: -

- Identifies determinant factors of construction projects success in the Construction industry of Adama city administration which will help in controlling, monitoring and evaluating of projects through out its' life cycle i.e. during planning, execution and closure time.
- The result of this research will be used as initial information in prioritizing, planning improvement action and in giving corresponding attentions for these very significant project success factors in Adama city administration Office.
- Contractor, Consultant, Small and Micro enterprise (SME), and Suppliers can also use the results of this research as reference to improve their knowledge for construction projects management.
- It can also be used as reference by researchers and academicians.

1.5 Scope of the Study

Conducting all parts of Ethiopian construction industry survey requires greater resources like budget and time which was beyond the capacity of the researcher.This study is limited to the following main characteristics:

- In terms of geographical coverage, this study is bounded only to Adama city Administration construction sector. The respondents of the survey are only from ACA and none of questionnaires were conducted out of ACA.

- Regarding time boundary, building, road and bridge construction projects of Adama city's construction sector over past five years are considered for assessing the level of construction projects success and determinant factors of construction projects are examined depending on the whole experiences that respondents have within the sector.
- Regarding conceptual boundary, this study focuses in examining determinant factors of construction projects i.e. Public buildings, roads and bridges undertaken in ACA.

1.6 Limitation of the study

During the research period, there have been different challenges, which have adverse effect on the results of the study. The primary limitation was inability to get the necessary information and finance. In addition, lack of clearly documented information in the municipality (disaggregated data in the office due to poor record and documentation) was a problem.

Moreover, the research focused on only critical success factors identified from literature the researcher reviewed. As there are more critical success factors, the result of this study is limited to only factors identified and addressed within this study. Lack of on time and honest responses as to the designed questionnaires, unavailability of relevant information and research data on the past and ongoing construction projects in Adama city administration construction sector, are outlined as the main limitations of this research paper.

Time was the basic limitation that precluded the researcher from further in-depth researching on the topic. As employees of City Administration were often busy on endless meetings there was no time for interviews and discussions. Due to this limitation, the input data for analysis is only form questionnaires. Hence, the generalizability of the findings is limited only to ACA.

1.7 Operational Definition

Project is any series of activities and tasks that have specific objective to be completed within certain specifications, defined start and end dates and consumes human and non-human resources.

Project success factors are factors that influences the success of a project or factors that causes project failure if poorly managed.

Project success criteria are criteria used to determine whether a given project is successful or not. A given project can be said successful if it is completed on time, within budget, with required quality and according to stakeholder's satisfaction.

Building, Road and Bridge (BRB) contactor is a contractor, which participates in construction of buildings, bridges and road works.

1.8 Organization of the Thesis

This research paper is organized in to five chapters. The first chapter deals with the introduction part which encompasses the background of the study, the statement of the research problem, objectives of the study, significance of the study, scope of the study and limitations of the study. The second chapter deals with the review of theoretical and empirical literature. Chapter three focused on the research methodology, data collection and procedures, sample and sampling techniques, whereas the fourth chapter presents the result analysis and discussion of the data. Finally, conclusions and recommendations were presented from the summary of the findings, under the fifth chapter.

Chapter Two

Review of Related Literature

2.1 Introduction

This part of the thesis focuses on theoretical approaches to examine the meaning and interrelationship between success factors in construction projects in general and governmental and non-governmental construction projects in Adama city administration in particular. Furthermore, worldwide-related studies and their experience related to construction industry in general and governmental construction projects specifically were viewed.

Critical Success Factors are the limited number of areas in which results, if they are satisfactory, will ensure successful competitive performance for the organization. CSF are few key areas where things must go right for the business. If results in these areas are not adequate, the organizational effort for the period will be less than desired. They are areas of activities that should receive constant and careful attention from management. CSF method is a top-down managerial approach, which identifies strategies and goals. The need to discuss project success criteria precedes CSF description because without clearly defined success criteria, identification of CSF will be meaningless (Mebrhit Weldegebriel, 2018)

Success is a word that encapsulates a general and wide idea. The perception it gets vary from person to person and from place to place, as it is wide and open-ended word. Due to this fact, it is challenging to provide a definite and consensus definition from all concerned individuals. But there has been a growing interest in identification of the success factors and the relationship it has with the project success (Pirotti, Keshaverzsaleh, Rahim, and Zakaria, 2020). The study of project success and determinant project success factors is considered to a means for increasing efficiency and effectiveness of projects. But amazingly, the definition concept that construction professionals have for project success has remained ambiguous (Nipin Joseph Babu, 2015).

Project success is the foundation for managing and controlling current projects, and for planning and orienting future projects. It is believed that things that cannot be measured cannot be improved. Advantages of evaluation of project success include but not limited to: increase ongoing surveillance capacity in order to track key project result areas, project managers are evaluated within their organizations based on their track records of managing successful projects, performance bonuses, raises, and promotions often ride on their ability to bring in these successful projects. Project success is an abstract concept and determining whether a project is successful is subjective and extremely complex (Silva, Warnakulasuriya, Arachchige, 2016).

2.2 Theoretical Review

Critical success factors(CSFs) are inputs to project management practice which can lead directly or indirectly to project success. It encompasses many elements, which have to be synchronized to ensure the project delivery on time. By its nature construction is a risky business. Current project management practices of organizations in the construction industry sector don't always ensure project success. Successful construction project greatly depends on how the project has been managed and controlled. The main problem with projects management practices have always been mentioned as planning, project implementation, cost and time overruns and quality non-achievement. To date, there is no comprehensive study that explores the important critical success factors from the perspective of project management practitioners. Thus, comprehensive studies on this problem are necessary (Alias, Zawawi, Yusof, Aris, N, 2014).

Cleland (1986) suggested that "project success is meaningful only if considered from two vantage points: the degree to which the project's technical performance objective was attained on time and within budget; the contribution that the project made to the strategic mission of the enterprise." Freeman and Beale (1992) provided an interesting example of the different points of view of 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 resources manager in terms of employee satisfaction, and chief executive officers rate their success in the stock market." Project success may be assessed by different interest groups—stockholders, managers, customers, employees, and so on. Criteria for measuring project success must therefore reflect different views (Stuckenbruck, 1986).

The success of a project can be determined from the perspective of the means (the project itself) or the end (what it was intended or expected to accomplish) depending on the interests of the stakeholder. Furthermore, regardless of means or ends, expectations of what the project was to achieve and perceptions of whether it achieved them often vary among stakeholders. This makes determination of project success highly contingent upon the expectations and perceptions of different stakeholders, and when the assessment is made (de Wit, 1988).

2.2.1 Project Management

Project Management (PM) is the application of knowledge, skills, tools, and techniques to project activities to meet the project requirements (PMBOK, 2008). PM has been independent discipline and its concepts and techniques are evolving from time to time.

Silva,Warnakulasuriya,Arachchige, 2016, stated that there are three streams of studies of project success; project success factors; these are the independent variables that make success more likely, project success criteria; these are the dependent variables that measure success, and the third stream was identified to be success factors and success criteria.

2.2.2 Construction Project

Construction project is mission undertaken to create a construction facility or a service such as road and highways, bridges, high rise buildings, port, airports, dam and irrigation systems, schools and health institutions etc. with predetermined performance objectives with the involvement of different project participants with different expectations (Silva et al., 2016).

2.2.3 Project Success (PS)

Project success is an abstract concept and determining whether a project is successful is subjective and extremely complex (Parfitt & Sanvido, 1993; Chan, 2002). Oxford Advance Learners' Dictionary defines "success" as "the fact that you have achieved something that you want and have been trying to do or get". Therefore, the PS could be defined as the fact that a project has achieved the objectives or goals of a particular project. However, often when defining PS, it includes project success criteria/measures (PSC). Pinto & Slevin (1988) suggested that PS should have two major components: issues dealing with project itself (time, cost, performance) and issues dealing with the client (use, satisfaction, effectiveness).

PS, project management success (PMS) and project performance (PP) can sometimes be a bit of confusing because these words have been used in different ways by different researchers in the literature. PP often refers to PMS. Semantically PS is measurable only after the project is completed (Morries & Hough, 1987, as cited in Han et al., 2012). De Wit (1988), Atkinson (1999), Lim & Mohamed (1999) and Cook-Davies (2002) have all differentiated project success (measured against the overall objectives of the project) against project management success (measured against the widespread and traditional measures of time, cost and quality). Efficiency measurers deal with time, budget and specifications; effectiveness measurers refer to achievement of project objectives, user satisfaction and the use of the project (Takim & Adnan, 2008). Moreover, it could be seen that different usage of these key concepts/words are dependent on when it is measured and on which criteria being used.

2.2.4 Construction Project Success

Construction projects success is an important issue for most of the governments, users and communities.

Modern construction projects are being significant challenges for both the clients and contractors to deliver the project successfully due to increasing complexity in design and the involvement of stakeholders. The definition of project success differs from person to person and even from project to. Project success is subjective and hence depends on people's perception perceived for it. Project success can be achieved if a given project is completed on time, within budget, with safety and with satisfying quality (Ramlee, Tammy, Mohd Noor, Musir, Abdul Karim, Chan, Mohd Nasir, 2016). Project success is reaching the objectives and the planned results in compliance with predetermined conditions of time, cost and performance. Project success was recognized to be a complex multi-dimensional concept encompassing many attributes (Shafiq Lutaaya, 2019). Project success mostly relates to general project objectives and the level of attainment of these objectives (Inna Didenko, konovets, 2008).

2.2.5 Construction Project Critical Success Factors/CSFs

Success factors are factors that influence, constitute as well as determine the success of a project. Critical success factors are those few key factors necessary to reach goals (Aminah Md. Yusof, 2012). Preliminary study on Critical Success Factors (CSFs) and the relationship between various attributes are essentially needed in identifying the project success. The important critical success factors will have direct impact on a construction project. All industries nowadays are dynamic and the construction industry is not excluded. In fact, construction projects involve in one of the most vibrant and complex environment. The increasing of uncertainties in technology, budget and development process create a dynamic construction industry (Ramlee, et al., 2016). Project success is an abstract concept and determining whether a project is successful is subjective and extremely complex. Therefore, the PS could be defined as the fact that a project has achieved the objectives or goals of a particular project. However, often when defining PS, it includes project success criteria/measures (PSC) (Silva, et.al, 2016). Oxford Advance Learners' Dictionary defines "success" as "the fact that you have achieved something that you want and have been trying to do or get".

Han et al. (2012) define SFs as factors that influence, constitute as well as determine the success of a project. SFs are those inputs to the management system that lead directly or indirectly to the success of the project (De Wit, 1988; Cooke-Davies, 2002). It has been agreed that CSFs are vital for managers to improve their organization in the sense that it will indicate that the progress is being made in particular areas.

It should be acknowledged that the contribution made by Pinto and his colleagues to this area. Slevin & Pinto (1986) proposed a model with ten generic CSFs which is known as Project Implementation Profile (PIP). Further in 1988, they proposed a more general measure of PS and in the same year (1988a) tested the importance of PIP to PS. The changes in the importance of project CSFs across four stages in the project life cycle. In 1990, they investigated the role of a set of project planning and tactical factors across the stages of the project life cycle. Chan et al. (2004) did a thorough literature review related to CSFs in seven major management journals and identified 44 SFs. Takim & Adnan (2008) identified 29 factors (project success effectiveness measures) and assessed their level of success criticality to the Malaysian construction projects. In addition to direct studies on PSFs/CSFs, studies on causes/reasons for project delay/failure, causes for cost overrun, project management's issues, bottlenecks and challenges could also be considered as valuable inputs to identifying CSFs in construction project context. However, various attempts have been made by different researchers to determine CSFs in construction projects in other countries. A number of variables influencing PS have been proposed. Some variables are common to more than one list, but there is no general agreement on the variables (Chan et al., 2004).

2.2.5 Construction Project Success Criteria

Traditionally, time, cost and specifications which are often referred to as Iron-triangle or/and Triple-constraints in literature are used as PSC. However, PSC have evolved drastically in the past decades (Silva, et al., 2016). Beyond triple constraints, researchers have included other factors such as stakeholder satisfaction, safety, profitability and others to be under project success criteria. Criteria used to determine are beyond the traditional Golden Triangle of time, cost and quality. According Mebrhit Weldegebriel (2018), Project objectives vary along four dimensions:

- Different stakeholders have different objectives (client and contractors are not the only ones worth considering)
- Objectives change for each major phase in project life cycle
- Objectives have a hierarchical dimension: the primary objectives vary for each level of management in an organization (it is important to understand organizational objectives and project objectives)

- Objectives vary with type of projects: ownership and motive (private/public sector), necessity (it should work), opportunity (it should pay), prestige (it should exist) and research (reaching a solution).

Project success criteria mean the measure by which success or failure of a project will be judged (De Wit, 1988; Cooke-Davies, 2002). PSC have evolved drastically in the past decades. For examples: Pinto & Slevin, (1988) included client's satisfaction, use and effectiveness in addition to time, cost and performance. Therefore, in literature, project success criteria have been used in various ways depending on their objectives and type of projects. Important point to note is that there is no general agreement over and PSC are still being evolved.

2.3 Empirical Review

Mebrhit weldegebriel (2018) states that, though various efforts are made to identify factors of projects success, still problems of delay and cost overrun of construction projects in Ethiopia remain. Within his research, he has identified another 9 factors to be considered as success criteria in addition to other criteria identified and considered by another researchers.

Mebrhit identified satisfaction of user, project team, contractor, client organization and donor organizations; learning and motivation for future projects; health, safety and environment to be considered in success criteria.

Gena L.Abraham, 2003 has classified critical success factors as external and internal factors. According to Gena, internal success factors are factors, which are within given organization and can be controlled by internal practitioners, while external success factors are those factors which are from outside organization. He has identified 3 external CSF i.e. Competitive strategy, market condition and political environment and 5 internal CSF i.e. organizational structure, technical applications, employee enhancement, evaluation and process bench marking.

The research undertaken by Zakari, et.al. (2016) has identified 11 categories that have been 58 factors that have an impact on projects success/failure in construction industry. Tshehla (2019) studied critical success factors of construction projects in hospitality industry and he has identified 30 critical success factors, which he categorized under 9 knowledge groups.

Category 1: Project team skill and competency

Under this knowledge group he has identified three critical success factors, i.e. skills and competency of project resources, project manager's performance and knowledge, and commitment and competency of project owner.

Category 2: Financial management

Under this knowledge group he has identified three critical success factors, i.e. financial capability, budgeting management, and costing and value of project.

Category 3: Resource management

Human resource management and construction resource management are considered under this knowledge group.

Category 4: Contracts management

Concession agreement, selection of concessionaire and long term commitment are CSF categorized under this knowledge group.

Category 5: Project management

Under this knowledge group he has identified six critical success factors, i.e. scope clarity, planning and control, coordination, time management, construction methods, and project risk management.

Category 6: Management support and innovation

Organizational structure, involvement of client/contractor and management support are considered to be CSF under this group.

Category 7: Stakeholder management

Conflict management, communication, participation and customer service are CSF considered to be under this group.

Category 8: Knowledge management

Two CSF i.e. continuous improvement and learning climate are identified.

Category 9: Partnerships

CSF for partnerships include: partnerships experience, partnership expertise, partnership structure, and risk sharing.

Sugumaran B, Lavanya M.R (2014) has done research on "Evaluation of critical success factors in construction projects" by taking seven main categories of factors affecting project success i.e. Project management factors, Procurement related factors, Client related factors, Design team related factors, Contractor related factors, Project manager related factors, Business and work environment related factors. Of these seven categories of factors affecting construction projects success, he has identified five categories to be main factors consisting category. And these were: Project management factors, Project manager related factors, Contractor related factors, Procurement related factors, Design team related factors.

Pirotti, Keshaverzsaleh, Mohd Rahim, and Zakaria (2020) have identified five factors to be significant for the success of a given project.

And these was positive relationship between communication, top management, project mission, personnel and project success and negative relationship between communication. Freeman and Beale (1992) reviewed the project management literature, identified seven main criteria for measuring the success of projects; five of them are more frequently used than others: Technical performance, Efficiency of execution, Managerial and organizational implications (mainly customer satisfaction), Personal growth, and Manufacturability and business performance.

Pinto and Slevin(1987) reported fourteen CSFs commonly related to implementation success across a wide range of companies and project types. These success factors were project mission, top management support, project schedules, client consultation, personnel recruitment, technical tasks, client acceptance, monitoring and feed back, communication and trouble-shooting, characteristics of the project power leader, power and politics, environmental effects and emergency. Babu and Sudhakar conducted a study in 2015 to systematically investigate the causes of project failure and how these can be prevented, managed, or controlled. They argued that the critical success factors within the Project are: Project Mission, Top Management Support, Project manager's competencies, Project schedule and plan, Client consultation, Project team members' competencies, Quality of suppliers and subcontractors, Technical tasks and Client acceptance.

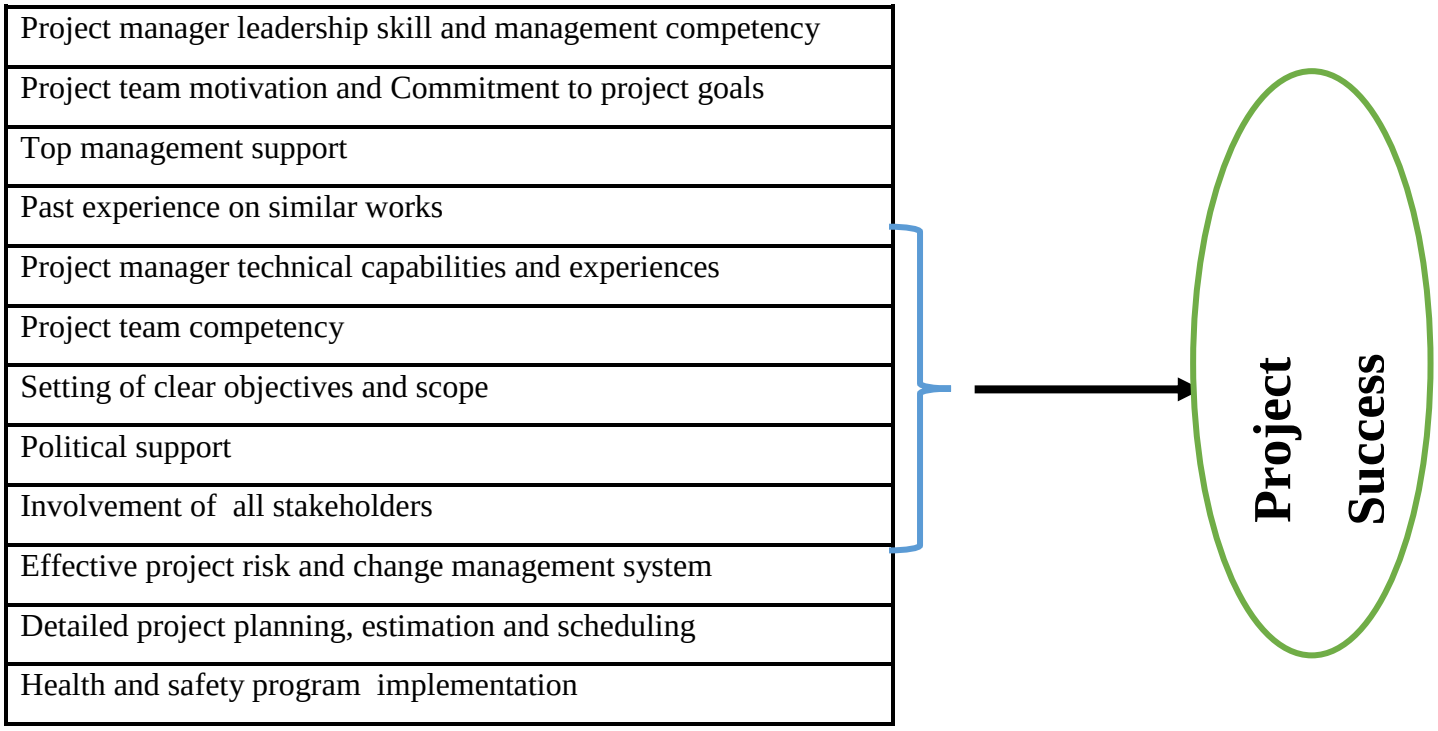
Research conducted at Texas University has developed a six-criterion system for project evaluation, these consist of cost performance, time performance, fulfillment of client expectation, fulfillment of project manager expectation, fulfillment of contractor expectation and project's performance. Other studies conform to the aforementioned success measure criteria with an additional focus on the project's quality; this resulted in adding other criteria that are related to pre-determined project's specification and quality of work. Within a decade, (1990 to 2000) further studies were conducted in an attempt to determine project success criteria. These studies stated different success indicators that can be divided into objective-related and subjective-related indicators. The objective related indicators deal with cost, time, safety, quality, specifications fulfillment, efficiency, and yields, whereas the subjective-related indicators deal mainly with one theme and that is the satisfaction of the stakeholders of the project. (Nguyen, et al., 2013)

2.4 Conceptual Framework

Construction industry is the center for any other activity due to the fact that any other business needs a shelter and a location which is provided by construction industry. And nowadays this industry is facing lots of challenges and constraints that have direct impact on project success (El-sokhn, N. H. and Othman, A.A.E.2014).

And this research will be conducted based on the following conceptual frame work. Summary of key success factors selected from previous literature review

Figure 2.1: Conceptual Framework



Source:- Researcher construction from literature

Chapter Three

Research Methodology

3.1 Introduction

Following literature review the gaps are identified in preceding chapter; chapter two. In these chapter the over view of methodology were discussed. Projects considered for case study are public building, road, bridge and water works to small consideration. In order to answer the presented research question in chapter one, the researcher provided a thorough description of the research methods. The research methodology chosen is based entirely on the research question and goals. Hence, the subsequent section deals with research design, research approach, data sources, data collection tools and data analysis.

3.2 Research Design

Descriptive research design is a type of research design that aims to obtain information to systematically describe a phenomenon. Descriptive research answers the questions who, what, where, when and how (Pervez & Kjell 2005). In this study, descriptive survey method was employed in order to assess the opinions of contractors, consultants, clients and regulatory body to assess the level of success of projects in which they had involved and to examine determinant factors of construction projects of ACA

3.4 Data Source

Type of data used for this study was both primary and secondary data. Primary data was obtained through questionnaire from contractors, consultants, client and regulatory body. The secondary data was obtained from archival documents and it is integrated with primary data for results interpretations and conclusion.

3.4.1 Primary Data

The source of primary data the researcher used for this study were clients, consultants, contractors and regulatory body who have direct or indirect contact with projects undertaken in construction industry of Adama city administration.

3.4.2 Secondary Data

Archival documents i.e. periodic reports, project reports and payment certificates have been reviewed to understand the background of projects. Finally, data obtained from the undertaken desk study were integrated with the data obtained from primary sources.

These steps started with a critical literature review to identify the most important success factors and then using these factors to set up the general layout of the questionnaire in accordance with relevant literature and secondary data.

3.5 Sampling design

3.5.1 Target Population

Archival documents shows that the target population of the study was 100 governmental and non-governmental organizations i.e. contractors, consultants and governmental officials i.e. clients and regulatory bodies in construction industry Adama city Administration.

3.5.2 Sampling frame

A sampling frame is a list of all eligible members of a population from which samples are drawn. It can be thought of as the pool from which samples are obtained. It is a statistical framework used in surveys, social research, marketing research, and different types of studies.

The sampling frame of the study was contractors, consultants, and governmental officials i.e. clients and regulatory bodies.

3.5.3 Sampling Technique

Sampling technique is a technique used for having or conducting an intended sample. Stratified sampling is a method of sampling that involves the division of population in to smaller sub-groups known as strata. The strata are formed based on members' shared attributes or characteristics. So, for this study, stratified sampling technique was used, as the population was heterogeneous. The total population of the study is classified in to four (4) strata i.e. client, contractor, consultant and regulatory body.

3.5.4 Sample Size

Sampling is used as a basis for statistical estimation, or illation from items, about the features of that population (Saunders, et al 2009). According to Sekaran (2003), sample is defined as subgroup or subset of the population. Besides, it also can be defined as a set of respondents selected from a larger population for the purpose of a survey. For this research paper, Yamane's simplified formula is used for calculating sample size and the formula is given by:

$n = N/(1+Ne^2)$ where: N= Number of total population, n= number of intended sample and e= degree of precision. The total population of the study was 100 and the precision degree of 5 % was taken.

So, n= 100/(1+100*0.05*0.05) =80 Hence, n= 80

For sample size determined above, using proportionate stratified sampling technique, number of sample for each strata is calculated using the formula.

Number of sample for each stratum = (sample size/ population size) *stratum size. For this study we have four strata i.e. client, consultant, contractor and regulatory body.

Number of people in each stratum i.e. client stratum, consultant stratum, contractor stratum and regulatory body stratum was 20, 30, 25 and 25 respectively. Therefore, using the above formula, the following summary is done regarding each stratum's sample size.

Table 3.1 Number of sample size for each stratum and population of each stratum

Characteristics	**Total population of study[A]**	**Strata**	**Total sample from total population [B]**	**B/A = C**	**Stratum size[D]**	**Number of sample for each stratum [E] = C*D**
Organization type/function	100	Client	80	0.8	20	16
		Consultant	80	0.8	30	24
		Contractor	80	0.8	25	20
		Regulatory body	80	0.8	25	20
Total	**100**	**4**	**80**		**100**	**80**

Source: - Researcher construction based on secondary data obtained from archival records

After number of sample for each stratum is known, respondents from each strata were selected using simple random sampling technique.

3.6 Data Collection Tools

Questionnaire provides first-hand information for the subject matter of a research as it is focused on issues, which further serves as a survey to understand the main concerns and attitudes of respondents towards the problems (Kasiem, 2008). The primary data collection tool used for this study was questionnaire.

In the final version of the questionnaire, the first page consisted of the Covering Letter, which explained the focus and the purpose of the questionnaire, and the institution in which the study was carried out. The cover letter also stated that the provided information would be treated in confidence. It also included the use of the given data and encouraging the participants to complete it, leave comments where they feel appropriate, and contact the researcher when they have any related question. (Saunders, et al., 2009).

The questionnaires researcher used have the following contents.

The first seven questions (questions 1,2,3,4,5, 6 and 7) were "Category questions". Under these questions participants were asked to identify type of their organization and their designation in that organization. In addition to these, their gender, age range, work experience, educational background and type of projects they involved in were identified under these questions. These questions were intended to collect some attributes related to the sample, therefore the "Category questions" type was used and the participants were not able to choose more than one answer.

Next, under 8th and 9th questions participants were asked to specify the value of projects and number of projects in which they have involved in the past last five years respectively. (Saunders, et al., 2009).

Tenth question was related to projects success. Here, respondents were asked to show their level of agreement with respect to success criteria developed from literature. For this question, 1 stands for extremely unsuccessful, 2 for unsuccessful, 3 neutral, 4 successful and 5 was very successful. Similarly, for the 11th question, 1 stands for very less important, 2 for less important, 3 neutral/moderate, 4 important and 5 stands for very important. And these coding was used in the final analysis of these factors. The design of this question lays under "Rating questions" type, and it follows Likert-style rating scale in which the respondents were asked to choose choice of their interest. (Saunders, et al., 2009; Bryman & Bell, 2003).

3.7 Data Analysis Techniques

The collected data was analyzed in accordance to data source. Data collected via questioners were examined quantitatively by relative weight examination method, whereas data obtained from secondary source were summarized and examined using qualitative technique of examination.

Moreover, descriptive statistics such as mean, standard deviation, percentage, frequency distributions were used to describe the research sample data.

Fitsum Gebru (2018) stated that “Relative weight examination may be a valuable strategy to calculate the relative significance of predictors (independent factors) when free factors are connected to each other. It is an elective to numerous relapse strategy and it addresses the multi collinear issue and additionally helps to calculate the significance rank of factors. It offer assistance to reply, "which variable is the foremost imperative and rank factors based on their commitment to R-square”.

3.8 Data Quality Assurance

As quality control of data is very crucial part of study, quality assurance was made starting from data collection, data entry and data interpretation. Before having a final questionnaire, a first draft of questionnaire was sent to professionals and project managers to verify the collected and identified data, and then the supervisor of the researcher checked it and based on the supervisor’s feedback the questionnaire was updated accordingly.

A pilot study test was made on the updated version of the questionnaire. The pilot study included four participants, and the questionnaire was once again updated considering the feedback from the pilot test’s participants concerning the length, the ambiguity, clarity, etc. The final version of the questionnaire was then obtained. (See appendix-A).

3.8.1 Trustworthiness

Trustworthiness of a study refers to the degree of confidence in data, interpretation, and methods used to ensure the quality of a study. It is about truthfulness of a given study. It is also defined as the believability of a researcher’s findings, i.e. all that a researcher have done in designing, carrying out and reporting the research make the results credible. It refers to the demonstration that the the evidence for the results reported is sound and when the argument made based on the results is strong.

3.8.2 Validity Test

Validity is defined as how much any measuring instrument measures what it is intended to measure. Bryman & Bell (2003) suggested that the important issue of measurement validity relates to whether measures of concepts really measure the concept. Validity refers to the issue of whether an indicator (or set of indicators) that is devised to gauge a concept really measures that concept. Several ways of establishing validity are: content validity; convergent validity concurrent; predictive validity; construct validity; and convergent validity (Bryman and Bell, 2003).

This study addressed face validity through the review of literature and adapting instruments used in previous researches.

3.8.3 Reliability Test

For assessing credibility of research findings, fulfilling the reliability criteria is fundamental. Reliability to how dependably or consistently a test measures a characteristic. Reliability test is a test used to check whether a person gets similar test score or not when that test is undertaken again. A test that gives similar result is a test showing reliability.

Cronbach's alpha is a reliability measure designed by Lee Cronbach in 1951 (Bhattacherjee, 2012). It is a coefficient of reliability and it is commonly used as a measure of the internal consistency or reliability of a psychometric test score for a sample of examinees. The level of reliability of the instrument that is the consistency of the variables is checked by the Cronbach's alpha statistics. Cronbach's Alpha can only be measured for variables, which have more than one measurement question. According to Sigmund, Babin and Griffin (2010) scales with coefficient alpha between 0.8 and 0.95 are considered to have very good quality, scales with coefficient alpha between 0.7 and 0.8 are considered to have good reliability, and coefficient alpha between 0.6 and 0.7 indicates fair reliability. Accordingly, the measure of alpha for this study was found to be 0.893 which is very good quality. Hence, data of this study are reliable.

Table 3.1 Reliability Statistics of the study for all factors together.

Cronbach's Alpha	N of Items/ N of free factors
.893	12

Source: SPSS Output for 2022 survey data

3.9 Ethical Consideration

The main ethical issue was regarding the questionnaires and seeking proper researcherization from the respondents in using their responses for analysis and reporting. The researcher sent a cover letter stating the purpose and usage of the data along with the questionnaire. This was used to seek access for collecting data from respondents and to convey the nature and purpose of the questionnaires. The other ethical consideration of this research was in keeping the findings not to be disadvantageous to participants. Concerning the use of sources and literature, all institutions and people whose work and publications have been used in this study were given recognition and credit by in text citation and in referencing.

Chapter Four

Results and Discussion

4.1 Results

In this chapter, results of the data gathered from the desk study and questionnaire survey are discussed. In order to streamline the reading and understanding of findings, the responses related to the research questions are presented in tables using percentages and frequencies as well as figures. The sample of 54 respondents participated in the generating of data out of the expected 80 respondents. This represents a percentage of 67.5 out of 100 from the population of 80 respondents from contractors, consultants, regulatory body and clients. Statistical package for social sciences (SPSS) was used to produce the required information.

4.2 Response rate

Response rate refers to the number of respondents who participated in survey. 80 questionnaires were sent to respondents i.e. 16 questionnaires for clients, 20 questionnaires for contractors, 24 questionnaires for consultants and 20 questionnaires for regulatory body. This constituted a response rate of (67.5%) 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.

Table 4.1 Respondents' response rate

S/N	Types of respondents	Distributed Questionnaires	Returned Questionnaires	Response Rate Percentage (%)
1	Client	16	10	18.5
2	Contractor	20	13	24.1
3	Consultant	24	18	33.3
4	Regulatory body	20	13	24.1
	Total in number	**80**	**54**	**100**
	Total in percentage	**100**	**67.5**	

Source: Questionnaire (2022)

4.3 Demographic Variables

The first section of the questionnaire involved questions, which related to demographic information of the respondents. Personal information of respondents such as: age, gender, education level, experience were asked under this section. The summary of these demographic characteristics of the respondents are explained in the following subsequent tables and figures.

4.3.1 Gender of respondents

The gender of respondents as shown in the Table 4.3 below confirms that the information in the research was collected from both male and female with the frequencies and percentages of 38 (70.4%) and 16(29.6%) respectively.

The outcome shows that respondents from both sex have participated and there was no non-disclosure of certain information because of personal interests relating to gender, though it can be clearly seen that male respondents did most of the answered questionnaires. This indicates that the number of proportion between male and female respondents participated in the study is not proportional

Table 4.2 Gender of respondent from data analysis

Gender	Frequency	Percent
Male	38	70.4
Female	16	29.6
Total	54	100.0

Source: SPSS Output for 2022 survey data

4.3.2 Age of respondents

The age of respondents as shown in the Table 4.4 below varies from 22 to 61 years. The age of most respondents lie in between 22-31 years, which accounts for 64.8 %(35) of all respondents. The age from 32-41 ranks second and it accounts for 25.9 %(14). Out of respondents, 7.4 %(4) their age is found in between 42-51 years. There is only one participant for age between 52-60years. From this analysis, it can be inferred that most of the respondents' age lies between 22-31, which indicates majority of respondents were youths.

Table 4.3 Age of respondent from data analysis

Age category	Frequency	Cumulative Percent
22-31	35	64.8
32-41	14	25.9
42-51	4	7.4
52-61	1	1.9
Total	54	100.0

Source: SPSS Output for 2022 survey data

4.3.3 Respondents Educational level

The fifth question of the questionnaire was about participants' education level and the result is shown as in the following figure. As it can be easily understood from the figure, of all 54 respondents, only single individual has Diploma. And a total of 48(88.9%) participants has Bachelor's degree and only 5(9.3%) participants have achieved Masters level.

This indicates that information collected from respondents were based on a wider academic knowledge area, which helps in responding the undertaken questionnaires. Moreover, it reflects the high reliability of the participants, which increase the credibility of this research and its results.

Table 4.4 Education level of respondent from data analysis

Education level	Frequency	Percent	Cumulative Percent
Diploma	1	1.	1.
Bachelor	48	88.	88.
MSC	5	9.	9.
Total	54	100.	100.

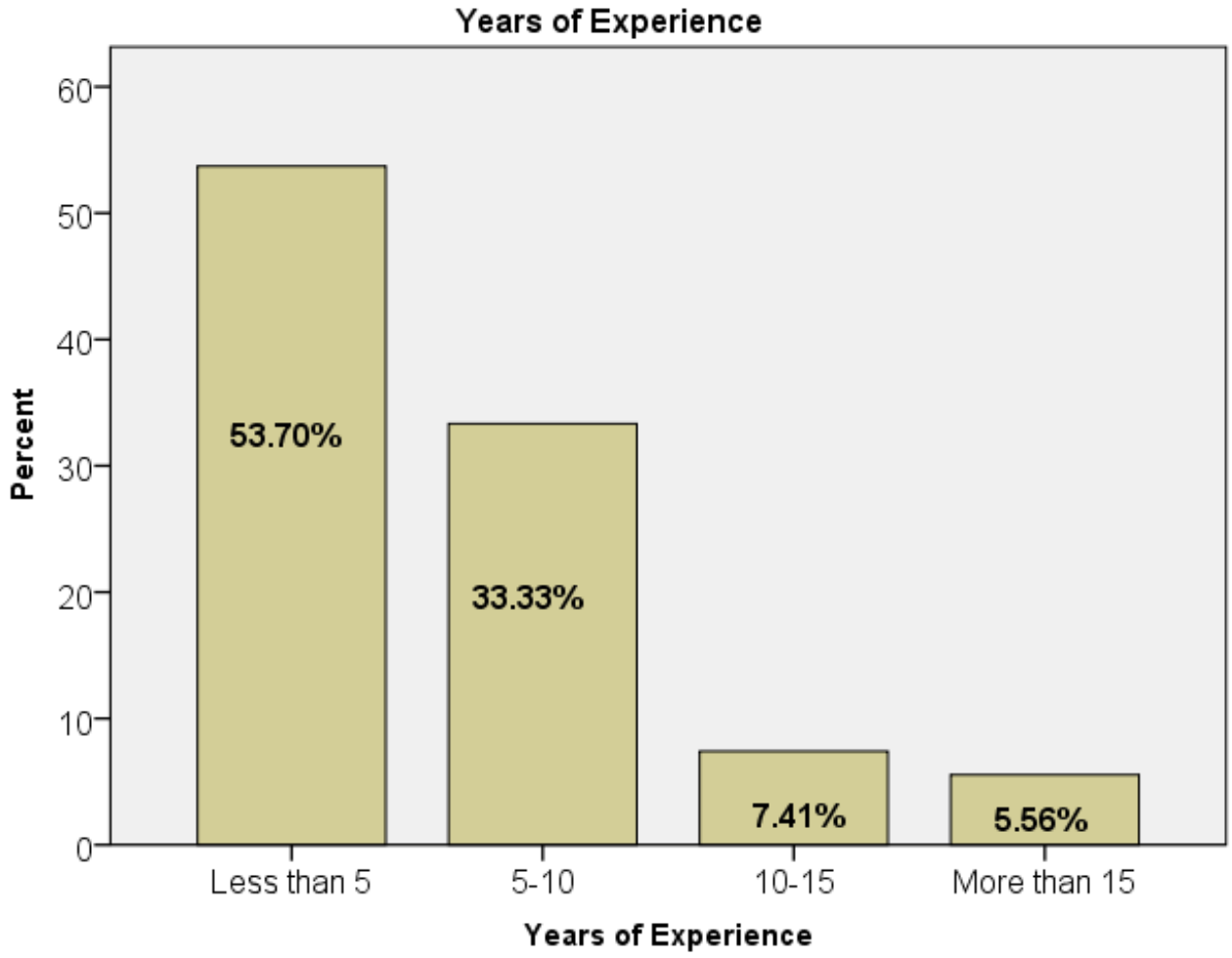
Source: SPSS Output for 2022 survey data

4.3.4 Respondents Experience

Participants' experience of work is illustrated using the following bar chart. As it can be seen from the bar chart, 53.7% (29) of respondents have less than 5 years experience, 33.33% (18) of them have 5-10 years of experience, 7.41%(4) of respondents have 10-15 years of experience, while 5.56% (3) of them have more than 15 years experience. From this, it can be concluded that experience of majority of respondents lie in between five to ten years, while respondents having more experience are few as compared to them.

This indicates that information collected from respondents were based on their experience at different position. It shows that majority of the respondents were professional enough to fill the questionnaires with full understanding.

Fig. 4.1: Participants' years of experience



Source: SPSS Output for 2022 survey data

4.4 Respondents Designation

The tabular representation of the respondents designation is presented in table 4.5 below. From this table it can be seen that: 20.4%(11) of respondents were project manager, 16.7%(9) of respondents were project coordinator and 9.3%(5) of respondents were project manager assistant. Out of respondents, 5.6%(3) members of steering committee, 11.1%(6) finance related respondents, 5.6%(3) Administrative staffs, 20.4%(11) monitoring, controlling and evaluating team members, 3.7%(2) communication and reporting members and total of 7.4%(4) other beneficiers participants were respondents involved in the study. Accordingly, the majority of respondents were project managers and monitoring, controlling and evaluating team members. Moreover, project manager assistants ranked third to be majority of respondents. This implies that participants of the study have enough experience and full background knowledge of the study area.

Table 4.5 designation of respondents

Respondents Designation		Frequency	Percent	Cumulative Percer
	Project Manager	11	20.4	20.4
	Project Coordinator	9	16.7	37.0
	Project Manager Assistant	5	9.3	46.3
	Steering Committee	3	5.6	51.9
	Finance Related	6	11.1	63.0
	Administrative Staff	3	5.6	68.5
	Monitoring, Controlling and Evaluating team member	11	20.4	88.9
	Communication and Reporting	2	3.7	92.6
	Other Beneficiaries	4	7.4	100.0
	Total	54	100.0	

Source: SPSS Output for 2022 survey data

4.5 Types of projects executed by respondents

The following table shows that 57.4% (31) of participants were involved in building projects, 22.2%(12) of them in road works, 5.6%(3) in water works, 5.6%(3) in BRB, and 9.3%(5) of respondents were participated in others construction works.

From this, we can conclude that an equal number of participants were involved in construction of water works and Building, Road and Bridge (BRB). On top majority of respondents are participants of building projects. The second top type of project in which participants involved were road works.

This implies that; of the construction undertaken in Adama city administration, building works and road construction works were respectively executed widely.

Table 4.6 Types of projects respondents involved in

Type of Your Project	Frequency	Percent	Cumulative Percen
Building	31	57.4	57.4
Road	12	22.2	79.6
Water works	3	5.6	85.2
BRB	3	5.6	90.7
Others	5	9.3	100.0
Total	54	100.0	

Source: SPSS Output for 2022 survey data

4.6 Value of projects respondents involved in

The table tabulated below, table 4.7 shows that 48.1%(26) of participants were involved in projects having a value of 5 to 15 million birr., 16.7%(9) participants participated in 15-50 million birr and 9.3%(5) participated in 50-100 million birr projects while 25.9%(14) of participants participated in projects having a value of greater than 100 million birr. From these data it can be inferred that, the cost of most projects lies in between 5 to 15 million birr and above 100 million birr. Hence, the size of executed projects range from small size to large size.

Table 4.7 Value of projects respondents involved in

Range of value of projects in million	Frequency	Percent	Percent
1-15	26	48.1	48.1
15-50	9	16.7	16.7
50-100	5	9.3	9.3
Above 100	14	25.9	25.9
Total	54	100.0	100.0

Source: SPSS Output for 2022 survey data

4.7 Findings of the study

The basic objective of this research was: (1) to investigate level of success of construction projects and (2) to examine determinant factors that contribute for construction projects success. So, the following sections dealt with issues related to the objectives posed at the outset of this thesis.

4.7.1 Success level of projects

Project success may be assessed by different interest groups i.e. stockholders, managers, customers, employees, and so on. Criteria for measuring project success must therefore reflect different views (Stuckenbruck,1986). Under this section based on the predetermined criteria found from literature, the success level of construction projects executed within study area was assessed. The predetermined criteria for success determination were: time, budget/cost, quality, and stakeholders' satisfaction.

4.7.1.1 Respondents response regarding projects completion within time

Time is one of the most important project success criteria for any project. It is used to evaluate whether projects' degree of success have addressed on time or not. It has also been mentioned as a factor, which can help the other factors/criteria to be met. Omran and M.A, (2012) have identified time, cost and quality to be criteria and factors influencing most types of construction projects.

The purpose of this research was to investigate within time completion of construction projects in Adama city administration. Accordingly, respondents' response was fed in SPSS software and it has been resulted in what is tabulated in the following table, table 4.8.

Table 4.8 project completion within time

Likert scale	Frequency	Percent	Cumulative Percer
Extremely unsuccessful	2	3.7	3.
Unsuccessful	12	22.	25.
Neutral	4	7.	33.
Successful	29	53.	87.
Very successful	7	13.	100.
Total	54	100.	

Source: SPSS Output for 2022 survey data

The above table shows that 53.7% of respondents agree that projects were completed within time successfully, while 12.96% respondents tells that projects were very successful in terms of time required for given projects completion. 3.7% of respondents responded that projects were extremely unsuccessful in being completed within time, while 22.22% respondents responded that projects were unsuccessful in terms of time. 7.41% of respondents were kept to be in neutral position. From this data, it can be seen that 66.66% of respondents agreed projects were completed within time, while 25.92% respondents argue that projects were not completed within planned time. It is found that the definition of time is of great importance. Time is the date when a project is most likely to be completed can be criteria, but time as a manageable component might be considered as a factor (Alias, Zawawi, Yusof & Aris, 2014)

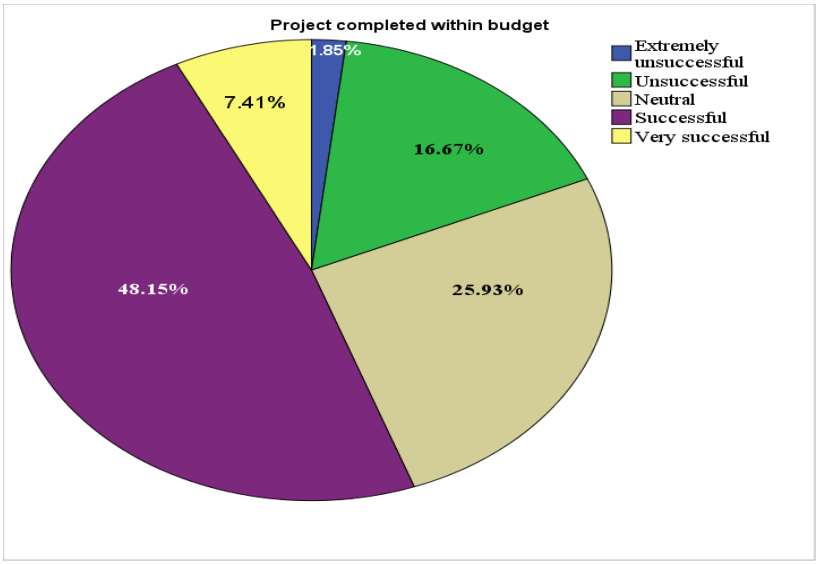
4.7.1.2 Respondents response regarding projects completion within budget

Without a doubt, every project is dependent on its cost or budget. It is one of the most success determining factors in execution of any projects.

Cost has been addressed as a very important success criterion, where as having an intellectual budget plan and proper cost estimation have been mentioned as prominent success factors in some studies (Mamaru, Esayas and Sintayehu, 2017).

One of the success criteria identified for projects implemented in Adama city Administration was budget. Accordingly, respondents' response was fed in SPSS software and it has been resulted in what is depicted in the following figure, figure 4.2.

Fig. 4.2: Participants' response result regarding project completion within budget



Source: SPSS Output for 2022 survey data

The above figure shows that 48.15% of projects were completed within budget successfully. At the 2nd rank 25.93% respondents choice to be in neutral position. 7.41% of responded that projects are completed within budget very successfully while 16.67% respondents agreed that projects were unsuccessful in terms of being finished within budget. Moreover, the remaining 1.85% of respondents responded that projects were extremely unsuccessful being finished within budget. Hence, 55.56% of respondents agreed that projects were completed within given budget, though 18.49% of respondents argued that projects didn't completed within budget.

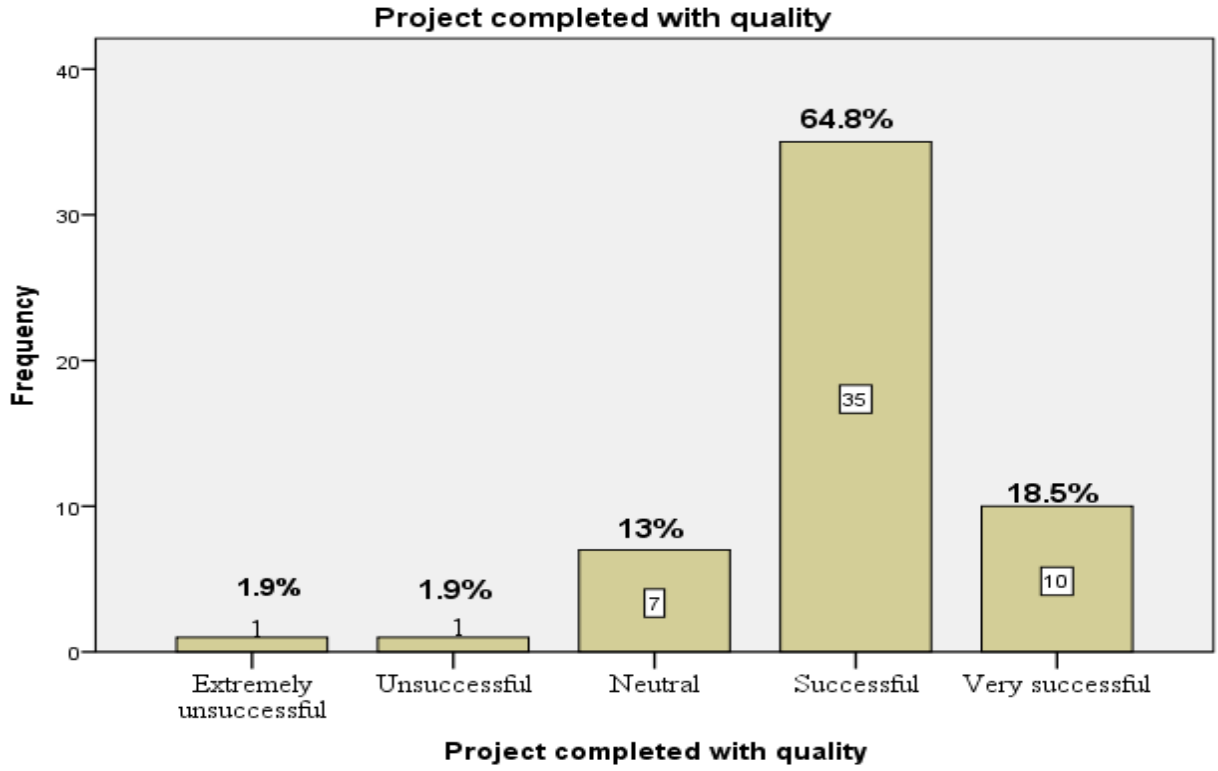
4.7.1.3 Respondents response regarding projects completion with required quality.

Quality is the condition of fulfilling the project requirements and meeting the customers' needs. A given project can be said it is completed with quality, if it is completed according to the given design and specification that fulfills the clients need.

Akanni, and Akpomiemie. (2014), stated that "Quality, whether it concerns the product or process, has been considered as both a project success criterion and factors.

Some researchers named it quality performance and considered it as a major project success criterion. In addition, some other researchers addressed quality as a criterion under the name of product's quality. On the other hand, some researchers considered quality management process as a project success factor, which facilitates the success of other criteria and factors".

Fig. 4.3: Participants 'response on projects success in terms of quality.



Source: SPSS Output for 2022 survey data

Majority of respondents (64.81%) agree that projects are successfully completed with required quality. 18.52% of participants agreed that projects are very successfully completed with quality. Moreover, 12.96% respondents are in neutral position, 1.86% respondents responded unsuccessful and 1.85% of respondents agreed that projects are extremely unsuccessful in terms of quality. It can be concluded that 83.3% of projects undertaken by respondents were successful, while 3.7% of total projects were unsuccessful in terms of required quality.

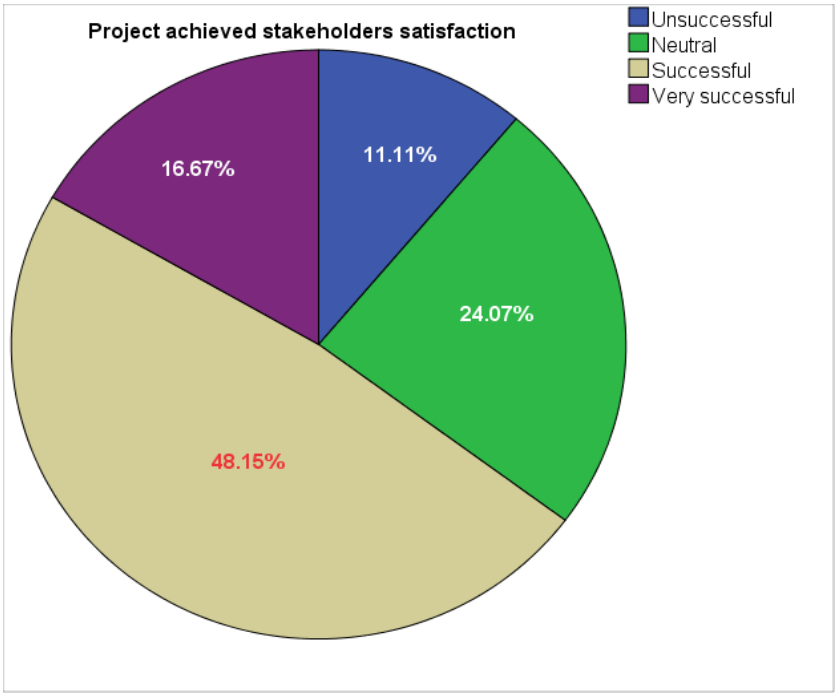
4.7.1.4 Respondents response regarding projects stakeholders' satisfaction.

Stakeholder satisfaction is a measurement of a program or project. It is measured by asking stakeholders to rate their satisfaction on numerical scale. Regarding stakeholders' satisfaction, respondents were asked to show their perception on projects completion in accordance with stakeholders' satisfaction.

From the collected data it has been seen that a significant number of projects (48.15%) were undertaken by successfully fulfilling stakeholders' satisfaction. According to respondents response, 16.67% of projects were very successful in satisfying the stakeholders.

In addition to this, 11.11% of participants argued that projects were unsuccessful in fulfilling stakeholders' satisfaction, while 24.07% participants choice to be in neutral position.

Fig. 4.4 : Participants' response on projects success in terms of stakeholders' satisfaction.



Source: SPSS Output for 2022 survey data

From the analysis undertaken, a very significant amount (48.15%) of respondents agreed that projects were executed in accordance to stakeholders' satisfaction.

This finding agree with the finding of Amanuel Haile(2019), which concluded that "The most achieved sub-dimensions of project success is Stakeholders' Satisfaction with mean score of 4.1717 respectively meaning that most of the project stakeholders had been satisfied by the outcome of the project".

4.7.2 Mean Values of Dependent Variables [Project Success]

The mean value of dependent variable is the average value that was given to dependent variables according to respondents perception and experience. The mean values of this research dependent variables i.e. project completion within time, within budget, with required quality and according to stake holders satisfaction were analyzed using SPSS Version 26 and the result is tabulated in the following table.

Table 4.9 project completion within time

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Project completed with quality	54	1.00	5.00	3.9630	.75143
Project achieved stakeholders satisfaction	54	2.00	5.00	3.7037	.88231
Project completed within time	54	1.00	5.00	3.5000	1.09458
Project completed within budget	54	1.00	5.00	3.4259	.92353
Total mean and Variance				**3.64815**	**0.9129625**

Source: SPSS Output for 2022 survey data

The above table shows that Cost aspect of project success has a mean score of 3.4259, which shows that the costs of most projects were a little bit higher than the original allocated budgets. The reason behind this may be political instability materials price fluctuations due to market inflations. The Time aspect of project success has a mean score of 3.5, which indicates that projects executed were moderately completed within time.

There is high variability in responses for time aspect and budget/cost aspect having a standard deviation of 1.09458 and 0.92353 respectively. There is moderate variability in responses for quality and stakeholders satisfaction aspects. The most achieved sub-dimensions of project success are quality and stakeholders' satisfaction with mean score of 3.9630 and 3.7037 respectively. Hence, the projects quality had been met up to the expectations and most of the projects stakeholders had been satisfied by the projects outcome. There is very high difference i.e. standard deviation between respondents' perception and responses for projects completion within budgeted time. The grand mean of all dependent variables was found to be 3.64815, which indicates a value of good mean. This implies that most of projects executed in the last five years were successful in accordance to the project success criteria set from literature review.

4.7.3 Determinants of Construction Projects Success

This study deals with twelve success factors that was selected based on the review of literature. See appendix B. The following code is used during analysis.

Table 4.10 Codes of success factors

Success factors	Code given
Project manager leadership skill and management competency	PMLMC
Project team motivation and Commitment to project goals	PTMACTPG
Top management support	TMI
Past experience on similar works	PEP
Project manager technical capabilities and experiences	PMTCE
Project team competency	PTC
Setting of clear objectives and scope	SCO
Political support	PSI
Involvement of all stakeholders	ISEC
Effective project risk and change management system	EPRM
Detailed project planning, estimation and scheduling	DPPES
Health and safety program implementation	HSPE

Source :- Researcher construction

4.7.3.1 Validation of Success Factors

To validate the 12 chosen success factors, the participants were asked to evaluate these factors whether they are: very less important, less important, medium important, important or very important for the project success, the results of this evaluation were shown in the table, table 4.11(Question 12 results).

A Likert scale was used to rank and accordingly 1 = very less important, 2= less important, 3= moderate important, 4= important and 5= very important.

Table 4.11 validation of success factors

Success Factors	**5**	**4**	**3**	**2**	**1**	**Sum of all Respondents responses**	***Mean***	***Std. Deviation***	***Variance***
PMLMC	36	13	2	2	1	243.00	4.5000	.88488	.783
PTMACTPG	29	21	3	0	1	239.00	4.4259	.76730	.589
TMI	23	22	4	0	5	225.00	4.1667	.92655	.858
PEP	20	24	7	2	1	222.00	4.1111	.90422	.818
PMTCE	30	17	5	1	1	236.00	4.3704	.87516	.766
PTC	21	27	4	0	2	229.00	4.2407	.75073	.564
SCO	24	20	6	2	1	223.00	4.2075	.92733	.860
PSI	15	18	11	6	3	195.00	3.6111	1.26516	1.601
ISEC	26	18	8	0	2	230.00	4.2593	.85086	.724
EPRM	20	21	7	5	1	216.00	4.0000	1.02791	1.057
DPPES	36	10	6	1	1	241.00	4.4630	.90518	.819
HSPE	28	20	4	0	2	234.00	4.3704	.89646	.804

Source: SPSS Output for 2022 survey data

The above table shows that values that respondents gave for success factors varies from 1 to 5 depending on the factors importance and their perception toward these success factors. The mean, standard deviation, and the variation coefficient for each success factor, where the variation coefficient is measuring the spread of the data in the relative variable sample is summarized and presented in the table 4.11(Saunders, et al., 2009). As it can be seen from the factor analysis, the importance of factors selected from the literature is confirmed.

Project manager leadership skill and management competency is a very important factor for 66.67% of participants having a mean of 4.5 with the eighth lowest variation coefficient of 0.783(The percentage for each factors is shown below: table 4.12). Due to this, Project manager leadership skill and management competency was found to be the leading determinant factors contributing for construction projects success.

Additionally, detailed project planning, estimation and scheduling and Project manager technical capabilities/experiences have got very important agreement of respondents' for 66.67% and 55.56% having mean of 4.4630 and 4.3704 respectively.

Moreover, a significant (53.7%) of respondents agreed that Project team motivation/coordination /Commitment to project goals has a very important contribution for construction projects success. For health and safety program implementation factor, 51.85% of respondents rated it to be very important factor. Involvement of all stakeholders/clients' and Effective communication, Setting of clear objectives/scope and top management support and involvement have got very important rank agreement from respondents with respective percentages of 45.61, 44.44 and 42.6, with a mean of 4.2593, 4.2075 and 4.1667 respectively. The remaining success factors i.e. project team competency, effective project risk/change management system /process, project manager technical capabilities/experiences, and political support and political instability were rated to be very important success factors by respondents with total agreement of 38.89%, 35.09%, 35.09% and 27.78% respectively.

Table 4.12 Percentages of success factors according to respondents

	Percentages (100%)						
Success Factors	**Very Important**	**Important**	**Medium Important**	**Less Important**	**Very Less Important**	**Sum from all Respondents**	***Sum of Percentages***
PMLMC	66.67	1.85	3.7	3.7	1.85	54	100
PTMACTPG	53.7	44.4	5.56	0	1.85	54	100
TMI	42.6	40.74	7.02	0	9.26	54	100
PEP	35.09	42.11	12.96	3.7	1.85	54	100
PMTCE	55.56	31.48	9.26	1.85	1.85	54	100
PTC	38.89	50	7.41	0	3.7	54	100

SCO	44.44	37.04	11.11	3.7	1.85	54	100
PSI	27.78	33.33	20.37	11.11	5.56	54	100
ISEC	45.61	33.33	14.81	0	3.7	54	100
EPRM	35.09	38.89	12.28	8.77	1.85	54	100
DPPES	66.67	18.52	10.53	1.85	1.85	54	100
HSPE	51.85	37.04	7.41	0	3.7	54	100

Source :- Researcher construction

4.7.3.2 Relative Importance Index

For each of success factors identified from literature review, Relative Importance Index is computed using the following formula;

$\text{RII} = \frac{\sum W}{N*A} = (0 \leq RII \leq 1)$…….. (1)

Where W is weight given to factors by respondents in the range of 1 to 5, N is the highest score available (5 in this case) and A is the total number of respondents that have answered the questionnaire.

The RII of each success factors is shown below.

Table 4.13 RII of success factors.

Project Success Factors	RII	Rank based on RII
Project manager leadership skill and management competency	0.900	1
Project team motivation and Commitment to project goals	0.885	3
Top management support	0.837	8
Past experience on similar works	0.820	10
Project manager technical capabilities and experiences	0.874	4
Project team competency	0.841	7
Setting of clear objectives and scope	0.844	6
Political support	0.720	12
Involvement of all stakeholders	0.830	9
Effective project risk and change management system /process	0.800	11
Detailed project planning, estimation and scheduling	0.893	2
Health and safety program implementation	0.870	5

Source :- Researcher construction

From the above table it can be seen that the six most important factors are, project manager leadership skill and management competency, detailed project planning, estimation and scheduling, Project team motivation and commitment to project goals, project manager technical capabilities and experiences, health and safety program implementation and setting of clear objectives and scope respectively in descending order from one to six.

4.7.3.1 Project manager leadership skill and management competency

Project manager is one main stakeholders in a construction projects and his or her competence is a major factor affecting project planning, scheduling, and communication. Skills and characteristics of project managers, commitment, competence and experience are major variables expected of project managers.. A construction project requires team spirit; therefore, team building is important among different parties. Team effort by all parties to a contract, owner, architect, construction manager, contractor, and subcontractors are a crucial ingredient for the successful completion of a project. From those ranked success factors leadership skills and competency of project manager (RII=0.90) took the first rank. Hence, project manager leadership skill and management competency is the determining factor for construction project success according to the respondents' perception.

This rank is in line with the rank that was given by Mamaru, et.al. within their work entitled "Investigation of Major Success Factors on Building Construction Projects Management System in Addis Ababa, Ethiopia". Within their study they have ranked project manager leadership skill and management competency in the first rank. Niphin Joseph(2015) have studied factors affecting success of construction projects and identified project manager leadership skill to be the first ranking factor which contributes for construction projects success.

4.7.3.2 Detailed project planning, estimation and scheduling

Project planning is a discipline addressing how to complete a project in a certain period, usually with defined stages and designated resources. The planning phase is when the project plans are documented, the project deliverables and requirements are defined and the project schedule is created. A detail planning helps in having good estimation. As early journey helps in on time arrival of final destination, detailed project planning, estimation and scheduling contributes for achieving of projects goals. It is due this why it is ranked second having a RII of 0.893.Therefore, detailed project planning, estimation and scheduling is the top second determinant of construction projects success. This finding corroborates with the finding of Susil (2016). Waseem Alshami(2018) has also found this factor to be the most important factor having a mean value of 2.73.

4.7.3.3 Project team motivation, coordination and commitment to project goals

Project team motivation, coordination, and commitment to project goals is one the determinant factors contributing for construction projects success. Team motivation for projects execution, coordination between themselves and other stakeholders, and their dedication toward projects end goal helps in achieving intended projects success. Accordingly, having a RII of 0.885, it has been ranked third determinant factors of construction projects. Though it has been included in most important factors, the result of this study is contrary with the result of study undertaken by Waseem(2018), as this factor has ranked third in this research and first in that research.

4.7.3.4 Project manager technical capabilities and experiences

Project manger technical capabilities such as planning and forecasting, risk management, budgeting, tracking an monitoring and project management methodologies are some traits expected from project manager for successful execution of projects. Moreover, communication and interpersonal skill, ability to negotiate and resolve conflicts and building commitment within are also very important inputs for project manager, like experiences that it has with such works. The RII for Project manager technical capabilities and experiences has been found to be 0.874 and it took the fourth rank from total factors. Mamaru, et.al. have listed project manager technical capabilities and experiences among determinant factors. But the rank given them and by this researcher differs. They have ranked project technical capabilities and project experiences 8^{th} and 12^{th} respectively.

4.7.3.5 Health and safety program implementation

Health and safety program implementation is one of most important factors for projects success. It accelerates projects to be completed within time and in conformance with all stakeholders' satisfaction. According to this study, health and safety program implementation took 5^{th} rank. This research in line with the work of Jaman(2013).

4.7.3.6 Setting of clear objectives and scope

A clearly set objectives and goal is an essential input for the success of projects. A project whose objectives and goals have a high probability of success as it acts according to its predetermined and preset objectives and scope. This study has found setting of clear objectives and scope to be among the most important factors, which contributes for success of construction projects. Hence, this factor has been set to be the sixth determinant of construction projects success having a RII of 0.844 with a mean of 4.2075. This finding is in line with findings of Maninder.S.et.al. (2020), who identified setting of clear objectives and scope to be among most important factors for success of construction projects.

Chapter 5

Summary, Conclusion and Recommendation

5.1 Summary of major findings

The main goal of this study was (1) to investigate the level of success and (2) to examine determinant factors of construction projects success in construction industry of ACA. A questionnaire-based survey was undertaken to investigate success level of projects and to examine determinants of construction projects success in construction industry of ACA. A conceptual framework was developed from existing literature in the area of success factors and data were collected and analyzed based on the responses obtained from 54 respondents. The project success level investigation was made by the respondents' perception of the project

success measured by its completion within the planned time, cost, quality standards and stakeholders' satisfaction.

A very significant amount (66.66%) of respondents agreed that those projects in which they were involved were completed within planned time with a mean of 3.5 as shown in the following table, table 4.12. The remaining respondents (25.92%) argued that projects were not completed within their planned time. Regarding projects completion within preset and preplanned budget, 55.56% of respondents agreed that projects were completed within given budget having a mean of 3.4259, though 18.49% of respondents argued that projects did not completed within budget. Respondents were asked about their projects completion with required quality and 83.3% of them responded that projects undertaken by them were successful having a mean of 3.9630, while 3.7% of total projects were unsuccessful in terms of required quality. Lastly, very significant amount (64.82%) of respondents agreed that projects were executed in accordance to stakeholders' satisfaction with a mean of 3.7037, while 35.18% of respondents argued that projects were not completed in accordance with stakeholders' satisfaction.

The mean, standard deviation, variance and Relative Importance Index (RII) of success factors were analyzed and based on the analysis they were ranked in descending order of importance as shown in Table 4.13. From success factors identified, six the most important construction projects success determining factors were selected.

Accordingly, these determinants factors were found to be :project manager leadership skill and management competency, detailed project planning, estimation and scheduling, Project team motivation and commitment to project goals, project manager technical capabilities and experiences, health and safety program implementation and setting of clear objectives and scope respectively in descending order from one to six.

From those ranked success factors leadership skills and competency of project manager (RII=0.90) took the first rank. Hence, project manager leadership skill and management competency is the determining factor for construction project success according to the respondents' perception. Detailed project planning, estimation and scheduling contributes for achieving of projects goals and it has got second rank having a RII of 0.893.Therefore, detailed project planning, estimation and scheduling is the top second determinant of construction projects success. Project team motivation, coordination, and commitment to project goals is one the determinant factors contributing for construction projects success. Having a RII of 0.885, it has been ranked third determinant factors of construction projects success in ACA. The RII for Project manager technical capabilities and experiences has been found to be 0.874 and it took the fourth rank from total factors. Health and safety program implementation has took 5^{th} rank. This study has found setting of clear objectives and scope to be among the most important factors, which contributes for success of construction projects. Hence, this factor has been set to be the sixth determinant of construction projects success having a RII of 0.844 with a mean of 4.2075.

5.2 Conclusion

The aim of this study was investigating the level of success and examining determinant factors of construction projects success in construction industry of Adama city administration. A number of literatures had been reviewed and a questionnaire-based survey was used to educe the perception of clients, regulatory bodies, contractors and consultants towards factors significantly contributing for the success of construction projects in construction industry of Adama city administration. 80 questionnaires were distributed to respondents i.e. 16 questionnaires for clients, 20 questionnaires for contractors, 24 questionnaires for consultants and 20 questionnaires for regulatory bodies. 54 questionnaires (67.5%) were returned as follows: 10 from clients, 13 from contractors, 18 from consultants, and 13 from regulatory bodies as respondents. Respondents were asked to indicate the importance level of each 12 success factors as not important, less important, moderate important, important and very important.

Therefore, based on the analysis of data and discussion of results, the following conclusion were made.

- According to respondents, more than half of projects executed in construction industry of Adama city administration in the past last five years were completed within planned time and one fourth of projects were not completed within their planned time.
- More than fifty percent of respondents agreed that projects were completed within given budget though ninety percent of respondents argued that projects did not completed within budget.
- More than eighty percent of respondents responded that projects were successfully completed with quality, while seventeen percent of total projects were unsuccessful in terms of required quality.
- Sixty five percent of respondents agreed that projects were executed in accordance to stakeholders' satisfaction, while thirty five percent of respondents argued that projects were not completed in accordance with stakeholders' satisfaction.
- It has been found that six most important construction projects success-determining factors were: project manager leadership skill and management competency, detailed project planning, estimation and scheduling, Project team motivation and commitment to project goals, project manager technical capabilities and experiences, health and safety program implementation and setting of clear objectives and scope respectively in descending order from one to six.

5.3 Recommendations

The researcher recommends the following based on the findings and conclusions of the study discussed above.

- Though most of Adama city administrations' construction projects were completed successfully, the city administration should do more to increase the success of projects to the maximum achievable level.
- Project manager needs to have leadership skill and management competency thus it helps in increasing construction projects success.
- Organizations should have detailed project planning, estimation and scheduling in order to achieve construction projects success.

- Project team should have motivation and commitment to project goals. Moreover, project manager technical capabilities and experiences, health and safety program implementation and setting of clear objectives and scope should be given enough attention and should be managed properly so they can have a positive influence on the success of construction industry.

5.4 Implication for future research

The findings of this research have the following implications.

Implication for knowledge

If all stakeholders being involved in construction projects get aware of determinants of construction projects success, the likelihood of project success will increase. Project manager having a good leadership skill and competency contributes for success. Hence, those factors identified as determinant factors should be taken in to consideration increasing the probability construction projects success.

Implication for future research

This research work is not the last one and needs to be followed by a number of researches to investigate scopes, which are not considered in this research, and to refine the concepts raised and further enhance our understanding, and contribute to the construction project management knowledge pool.

Therefore, the researcher recommends the following for further research and investigation:

- ★ Conducting research by increasing the sample size and studying the area more in depth by deploying different methodology at country level
- ★ Conducting further research to refine the success factors and the assessment questionnaire through active involvement of academicians and professionals using focus group and further extensive literatures review.

Implication for policy

This research has implications for policy making. The success factors that keep showing up as most important factors may draw policy makers' attention.

The gap between academician and industry and public researcher ties could be bridged through further communication. Companies may prepare their training and development program by considering this factors from the beginning of their work.

Implication for practice

The practical implications of this study can be one of the following.

- ✓ Construction companies should take into account leadership skills and competency of project manager when recruiting and assigning project managers to their projects as it is the top determinants of construction projects.
- ✓ Rather than only planning and acting with out considering these most important success factors, consideration should be given for them from project inception to project completion phase.

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Appendices

Appendix A

Questionnaire

General Information

This research survey is designed to fulfill an academic research paper requirement for the partial fulfilment of M.Sc. degree in Project Management at Harambee University.

Dear respondent,

I am Student of Masters of science degree in project Management, (PM), at Harambee University. As partial fulfillment of the program, I am undertaking a research on the topic "**Determinants Of Construction Project Success In Construction Industry Of Adama City Administration"**. The research outcome could be helped as an input for decision makers, professionals, academician and other interested groups to play their respective role for the achievement of project objectives.

The questionnaire consists of four sections. Section 1 General profile of the respondent, Section 2 General question related to project success level, and Section 3 General question related to determinants of construction project.

Your response, in this regard, is highly valuable and contributory to the outcome of the research. All feedback will be kept strictly confidential, and utilized for this academic research only.

For any clarification on this questionnaire, please contact the researcher on **+251 932576946**

Thanks in advance

Jemal Kedir

Post graduate student, Project Management

Harambee University, Department of Project Management

Adama, Oromia, Ethiopia

Advised by: - Mulachew Haile(RS)

Section A: General Information

1. Type of Your organization Client ☐ Consultant ☐ Contractor ☐ Others ☐_____

2. Your designation in the organization/your role in the implementation of construction projects

Project manager ☐ Project Coordinator ☐ Project manager assistant ☐

Steering committee ☐ Finance related ☐ Administrative staff ☐

Monitoring, controlling and evaluating team member ☐ communication and reporting ☐

Other/beneficiaries ☐

3. Please indicate your gender Male ☐ Female ☐

4. Age (in year) 22-31 ☐ 32-41 ☐ 42-51 ☐ 52 -61 ☐ Above 61 ☐

5. Please tick on your education level Diploma ☐ Bachelor ☐ Masters ☐ Doctoral ☐

6. Please indicate your years of experience of working in Construction industry/construction projects ☐ ☐ ☐ ☐

Less than 5 years 5 – 10 years 10 – 15 years More than 15 years

7. Please indicate the type of your project

Building ☐ Road ☐ Bridge ☐ Water works ☐ Others ☐

8. Value of executed projects in the last five years (in million Birr)

1 – 15 ☐ 15 – 50 ☐ 50 - 100 ☐ More 100 ☐

9. How many projects have been executed in the past five years? Please write it here _____

10. Success Criteria (SC) are the measures used to judge project success. SC answer the question: 'how do you determine if a project is a successful?

From literature, the following list with SCs was derived. How successful was your projects executed in the last five years? Please rank according to the scale 1 – extremely unsuccessful 2 – unsuccessful 3 – Neither successful nor unsuccessful 4 – Successful 5 - extremely successful

Time required for project completion	1	2	3	4	5
Delivering the project within budget	1	2	3	4	5
Delivering the project quality requirements	1	2	3	4	5
Achieving stakeholders' satisfaction	1	2	3	4	5

11. According to the success criteria listed above under question number 10, how many of your projects were successful? Please write it here in number _____

12. Based on your experience, how important are the following factors to achieve construction projects success? Tick under 1 if Very important. Tick under 2 if important, Tick under 3 if medium important. Tick under 4 if less important and tick under 5 if it is very less important.

S/N	**Critical Success factors**	**1**	**2**	**3**	**4**	**5**
1	Project manager leadership skill and management competency					
2	Project team motivation and Commitment to project goals					
3	Top management support					
4	Past experience on similar works					
5	Project manager technical capabilities and experiences					
6	Project team competency					
7	Setting of clear objectives and scope					
8	Political support					
9	Involvement of all stakeholders					
10	Effective project risk and change management system					
11	Detailed project planning, estimation and scheduling					
12	Health and safety program implementation					

Appendix B

List of Project Success Factors

S/N	Success factors	Sources of Success factors												Frequency
		1	2	3	4	5	6	7	8	9	10	11	12	
		Susil.LK.et.al., 2016	Jaman I.et.al., 2013	Waseem Alshami,2018	Nipin.J. ,2015	Ainel.K.et.al., 2010	Zakari.Ts..et.al., 2016	Inna.D.et.al., 2008	Maninder.S.et.al.,20200	Afshin P.et.al.,2012	Vitalijus Aleksejevec,2019	Murat.G.et.al., 2015	Garbharran, et. Al.,2012	
1	Project manager leadership skill and management competency													11
2	Project team competency													7
3	Managing and controlling of sub-contractor works													4
4	Administration and bureaucracy													2
5	Top management support and involvement													8
6	Effective contract management system													5
7	Past experience on similar works/Previous performance													8
8	Project site management, control and coordination													4
9	Turnover history													4
10	Adequacy of labor/plant resources													4
11	Market fluctuation(materials cost inflation)													4
12	Size of past project completed													5
13	Company image in business													1
14	Quality policy/Quality assurance program													5
15	Right project manager/contractor													1
16	Setting of clear objectives/scope													7
17	Shared project vision													1
18	Regular update of plans													1
19	Availability of resources/ resources as planned													5
20	Adequate funding													3
21	Contract documentation/ Eff. document control system													3
22	Utilization of update technology													4

23	Project team motivation/coordination /Commitment to project goals													9
24	Handover procedures													1
25	Political support and political instability													7
26	Involvement of all stakeholders/clients' involvement and monitoring/Effective communication													7
27	Frequent project meetings													3
28	Community involvement													5
29	Detailed project planning, estimation and scheduling													6
30	Effective allocation and control of manpower													2
31	Clarity of roles and responsibility													2
32	Rapid change in national economy													3
33	Bribe, corruption and favoritism													2
34	Instability and inefficiency of government policies and legal systems													3
35	Health and safety program implementation													6
36	Effective project risk/change management system /process													7
37	Physical environment/safe working environment													3
38	Adequate career development programs and Education training													3
39	Project manager technical capabilities/experiences													8
40	Appropriate organizational structure													2
41	Social/Environmental effects													3
42	Schedule/cost/quality control													3
43	Economic situation													2
44	Adequate supports of stakeholders													1
45	Minimum difficulties in transition from planning to implementation phase													1
46	Competence of stakeholders													3
47	Project organization													2
48	Project manager researcherity													2
49	Team spirit between project key players													1
50	Purchasing/tendering system and process													5
51	Project complexity													3
52	Effective /on-time decision making													3
53	Conflict management													5