ADDIS ABABA UNIVERSITY
SCHOOL OF COMMERCE
GRADUATE PROGRAM IN PROJECT MANAGEMENT

Factors Affecting Implementation of Genale Dawa Hydropower Project

By: Fikre Hailu

A Research Proposal Submitted to Addis Ababa University, School of Commerce, in Partial Fulfillment of the Requirements for Degree of Masters of Arts in Projects Management

Advisor: Mengistu Bogale (PhD)

February, 2021

Addis Ababa, Ethiopia

ADDIS ABABA UNIVERSITY
SCHOOL OF COMMERCE
DEPARTMENT OF PROJECT MANAGEMENT

Factors Affecting Implementation of Genale Dawa Hydropower Project

By: Fikre Hailu

A Research Proposal Submitted to Addis Ababa University, School of Commerce, in Partial Fulfillment of the Requirements for Degree of Masters of Arts in Projects Management

Advisor: Mengistu Bogale (PhD)

February, 2021
Addis Ababa, Ethiopia

ADDIS ABABA UNIVERSITY

SCHOOL OF COMMERCE

DEPARTMENT OF PROJECT MANAGEMENT

Factors Affecting Implementation of Genale Dawa Hydropower Project

By: Fikre Hailu

Approved by Board of Examiners:

Internal Examiner	**Signature**	**Date**
External Examiner	**Signature**	**Date**
Advisor	**Signature**	**Date**

STATEMENT OF DECLARATION

I, the undersigned, hereby declare that the study which is being presented in this thesis entitled **"FACTORS AFFECTING IMPLEMENTATION OF GENALE DAWA HYDROPOWER PROJECT"** is original work of my own. It had not been presented for a partial fulfillment for any educational qualification at this university or any other and in any projects by any means, and all the resources materials used for this thesis had been accordingly acknowledged.

Fikre Hailu

Date

ACKNOWLEDGEMENT

I am so thankful to the **Almighty God** who has made it possible, under all circumstances, for me to carry out this research. I am also so grateful to my advisor **Mengistu Bogale (PhD)** for the useful comments, remarks, and engagement through the learning process of this study. Also, I would like to thank the participants in my survey, who have willingly shared their precious time during the process of filling the questionnaire and interviewing.

Finally, I would like to express my gratitude to my wife **Hiwet Yemane**, and my son, **Alula**, for their sacrifices, patience and understanding shown.

ABSTRACT

The purpose of this study was to establish factors affecting implementation of Genale Dawa hydropower project. The study employed descriptive research design. The research sought to achieve five specific objectives with the key variables examined being dependent variable implementation of Genale Dawa hydropower project and independent variables being stakeholder engagement, monitoring and evaluation system, top management support, team building and communication system. The quantitative data collected using questionnaire was analyzed using descriptive statistics with the aid of SPSS. 76.7% of the respondents agreed that the project has not completed on time, within budget, meets quality target and did not contribute to the achievement of the EEP's strategic objectives. From the findings of the study, it was concluded that top management support to a large extent affects the implementation of the project. The study also concluded that stakeholder engagement affects the implementation of the project. The study further concluded that monitoring and evaluation system, team building and communication system affects implementation of the project. The study recommended that stakeholder engagement to be improved significantly, top management support by providing the necessary resources and authority and making fast decisions. The study also concluded there should monitoring and evaluation system, team building and communication system during implementation of the project.

Key Words: Success factors, Project implementation, hydropower project, stakeholder engagement, top management support

Table of Contents

LIST OF TABLES AND FIGURE

LIST OF ACRONYMS

EEP Ethiopian Electric Power

ETB Ethiopian Birr

GoE Government of Ethiopia

GWh Gigawatt Hour

GTPII Growth & Transformation Plan II

IEA International Energy Agency

IFC International Finance Corporation

IHR International Hydropower Report

kV kilovolt

kW kilowatt

MoWIE Ministry of Water, Irrigation and Energy

MW Megawatt

SPSS Statistical Package Social Sciences

USBR United States Bureau of Reclamation

USD United States Dollar

REN21 Renewable Energy Policy Network for 21st century

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Energy is essential to economic and social development and to improve the quality of life of the people and is also an important development indicator, which provides vital inputs for economic development (Boyle, 2004). The African continent has abundant energy resources, which still remains untapped. Renewable Energy in form of hydro, geothermal, wind and solar is a major energy resource spread out across Africa. The energy which can be extracted from these resources can solve the most prominent problem that persists in the continent shortage of power. The potential of these renewable energy sources is so high that it can solve the problem of shortage, as well as provide the power to everyone at affordable rates (Mallon, 2006).

Renewable energy provides one of the most effective strategies to simultaneously promote clean development, sustainable access and energy security with its irreplaceable role in climate change mitigation at all levels. One of the renewable energy sources is hydropower.

Worldwide, hydropower is a crucial power supply option for several reasons. First, it is a renewable energy resource that can contribute to sustainable development by generating local, typically inexpensive power. Second, hydropower reduces reliance on imported fuels that carry the risks of price volatility, supply uncertainty and foreign currency requirements. Third, hydro systems can offer multiple co-benefits including water storage for drinking and irrigation, drought-preparedness, flood control protection, aquaculture and recreational opportunities, among others. Finally, hydro can allow more renewables— especially wind and solar—to be added to the system by providing rapid-response power when intermittent sources are off-line, and pumped energy storage when such sources are generating excess power. (IFC, 2015)

The use of hydroelectric power started in the 1890s. Electricity generation from hydropower uses the water stored in reservoirs to drive turbine generators where the amount of the power generated depends on the amount of water flow and the head (the height difference between the source and the water's outflow). Since its start, hydropower

has played a great role as an energy source and today it supplies about 16.2% of the world energy consumption (IEA, 2009). There are no considerable emissions associated to the industry and operational costs are minimal. Maintenance costs are also low as hydropower plants are very reliable in their nature.

Ethiopia is endowed with plenty of potential sources for generating renewable energy from water, wind, solar and geothermal. Nevertheless, it is one of the lowest energy consuming countries in the world. In 2017, only 44 percent of its 100 million inhabitants had access to electricity. For the approximately 80 million people living in rural areas, this figure is only 31 percent. The lack of electricity seriously limits the country's potential for socio-economic development.

Ethiopia's hydropower potential is estimated up to 45,000MW and is the second highest in Africa. Hydropower based development provides a gateway to economic transformation through industrialization, urbanization as well as through the provision of access to modern energy to rural areas. The current installed capacity of Ethiopia is 4,233MW with almost 98 percent of it from renewable and of which effective hydropower installed capacity is 3,810MW. Furthermore, 8,864MW of hydropower development is under construction.

As specified in the Ethiopian Growth & Transformation Plan II (GTP2, 2015-2020), the Government of Ethiopia (GoE) planned to increase its power generation to 17,000MW from different renewable sources and hence has focused on the construction and expansion of various power generating projects to deliver reliable electricity to achieve the GTPII goal. To achieve this power generation capacity, the Government of Ethiopia has launched many power projects from wind, hydro, geothermal and others. One of the projects the government planned to do from hydro was Genale Dawa hydropower project with 254MW installed capacity and 1640GWh annual energy.

A project can be defined as a set of a large number of activities or jobs that are performed in a certain sequence determined logically or technologically and it has to be completed within a specified time and cost whilst meeting the performance standards (Agyei, 2015). The end is reached when the project's objectives have been achieved or when the project is terminated because its objectives will not or cannot be met or when the need for the project no longer exists.

Project implementation also referred as project execution, is a phase in which the project vision and all the plans of the project become a reality and financial resources of the project are allocated. Many projects fail during implementation and often lack to meet the local people's needs or the beneficiaries need (Mahianjo & Njeru, 2016). According to Jugdev and Muller (2005), the project implementation process is complex, usually requires extensive and collective attention to a broad aspect of human, budgetary and technical variables. In addition, projects often possess a specialized set of critical success factors in which if addressed and attention given will improve the likelihood of successful implementation. According to Kernzer (2017), a project is generally considered to be successfully implemented if the project objectives are achieved within time, within cost, with minimum or mutually agreed upon scope changes, at the desired performance or specification level, while utilizing the assigned resources effectively and efficiently and with acceptance by the customer/user.

Like most construction projects in Ethiopia, hydropower projects are far from successful implementation. Almost all hydropower projects in Ethiopian Electric Power suffered from excessive cost overrun and schedule delay and Genale Dawa hydropower project was no different. This research sought to achieve five specific objectives with the key variables examined being the dependent variable implementation of Genale Dawa hydropower project and independent variables of project success factors being stakeholder engagement, monitoring and evaluation system, top management support, team building and communication system.

1.2 Background of the Organization

1.2.1 An Overview of Ethiopian Electric Power

The former organization named as Ethiopian Electric light and power Authority (EELPA), which was established in 1956 as authority agency wholly owned by the Ethiopian Government and it was converted to a Corporation in 1997 under the Public Enterprise Act of 1992. Then, at 2013 it was divided in to two companies called Ethiopian Electric Power (EEP) and Ethiopian Electric Utility (EEU).

EEP is a state owned electric producer and purchaser established in 2013 under the Ethiopian Reg. No. 302/2013 to undertake feasibility studies, design and survey of

electricity generation, transmission and substation construction and upgrading, handle electricity generation and transmission operational and maintenance activities, lease electricity transmission lines, sell bulk electric power, purchase bulk power from independent power producers and undertake universal electric access works and facilities by own force or through contracting out to contractors and consultants as required that would enable it to achieve its purpose in accordance with economic and social development policies and priorities of the government. By now, the organization operates 14 hydropowers, 3 diesel generators, 1 geothermal and 3 wind farm power plants with a total installed capacity of each power source options 3,810 MW, 87 MW, 7.5 MW and 324 MW respectively and this brought a total of 4,233MW (www.eep.com.et, [Accessed 10 Jan. 2021])

1.2.2 An Overview of Genale Dawa Hydropower Project

1.2.2.1 Project Location

Genale Dawa hydropower station is located at 5°38'N, 39°43'E, in the area of tropical rain forest. The project area is in the South part of Addis Ababa, the capital city of Ethiopia and about 400km towards east direction; it is close to Somalia and Kenya border.

The project area is located some 400km (air distance) south-south-east of Addis Ababa and some 200km (air distance) north of the border with Kenya. The scheme, including the reservoir and power waterways, extends over a river corridor some 55km long. The approximate centroid of the project area lies at latitude 5º 38' North and longitude 39º 43' east.

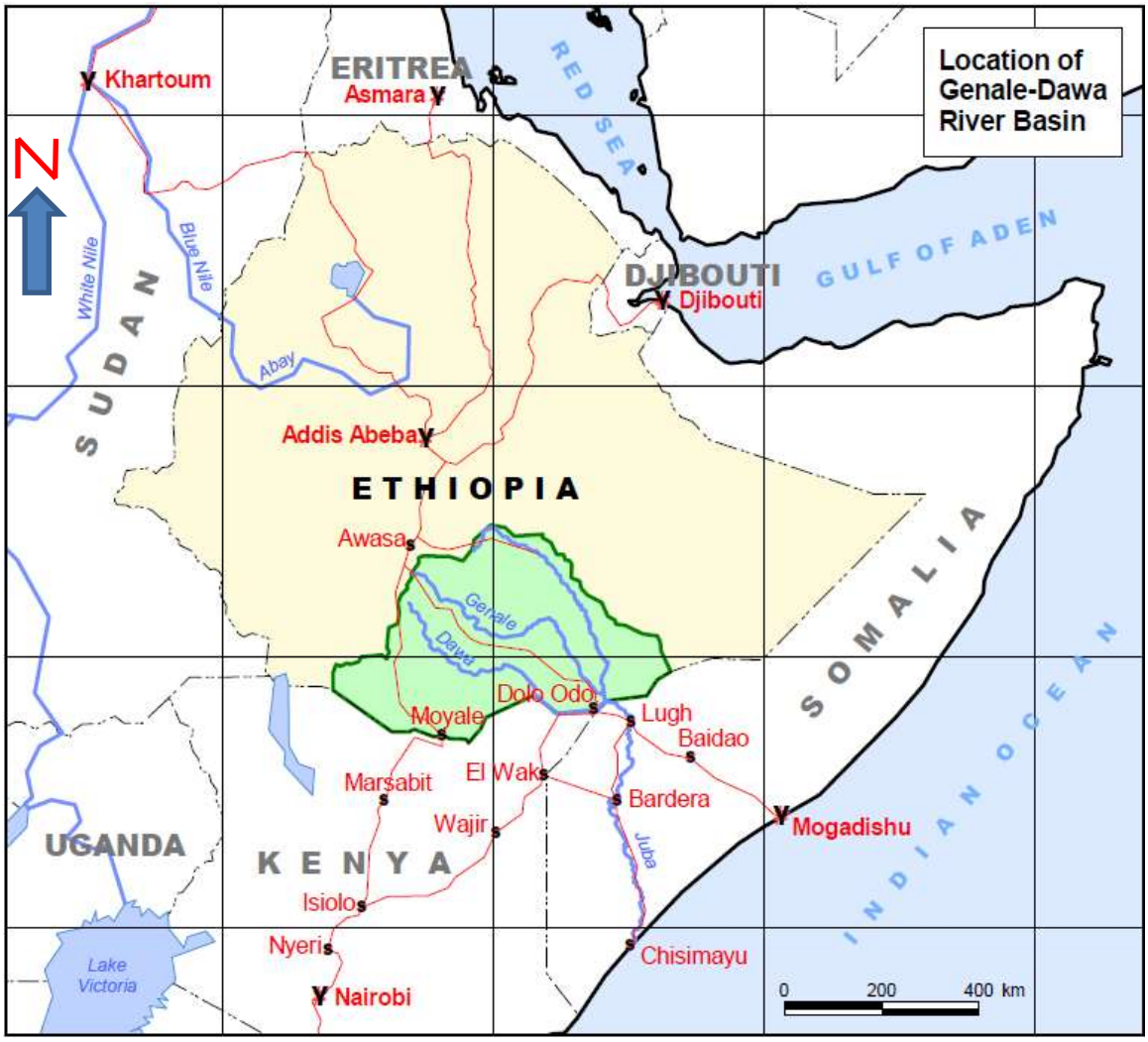

Figure 1: Project Location

1.2.2.2 Project Description

The GD-3 Hydropower Project comprises a large Concrete Faced Rock Fill Dam (CFRD) and an underground powerhouse. The 110m high dam will create a huge reservoir with a surface area of some 98km² and a total storage of almost 2,570million m³. The power scheme comprises a 12,400m long TBM driven headrace tunnel, a 120m high surge shaft, a steeply inclined 216m deep pressure shaft, a 285m long high pressure headrace tunnel, an underground powerhouse accommodating 3x84.7MW Francis turbine generator units, a tailrace surge chamber and a 1,480m long tailrace tunnel.

The scheme exploits a total gross head of some 280m to generate on average 1,640GWh of energy per year. A 400kV double circuit transmission line will convey this energy

270km North-West to the town of Yirgalem in the Sidama Regional State. In the future, a 230kV double circuit transmission line will convey this energy 275km South-west to the town of Mega, a town near to the border of Kenya. A converter station at Mega and a 520km long 500kV DC transmission link will feed the energy into the Kenyan power grid at Eldoret, close to Kenya's border with Uganda. As such, the project could be a major element of an inter-African power trading arrangement.

1.3 Statement of the Problem

According to (PMI, 2017) many projects often fail in the implementation stage and they do not meet the local people's needs. These projects even after being well thought in the conception stage but major discrepancy usually arise between what was planned and the actual implementation. During the implementation of projects, disconnect may arise between commitments made at different levels and actual implementation on the ground. These commitments are designed to achieve the projects' desired results and would determine the success or failure of the projects. The success of any project can be defined in terms of several things and this includes timeliness, working within the budget and meeting stakeholder's expectations. Many projects fail during implementation stage and often lack to meet the local people's needs or the beneficiaries need (Kerzner, 2017).

The concept of project success remains one of the most frequently discussed subjects in the field of project management. However, project management scholars continue to disagree upon it. Greer (1999) stated that the most basic definition of project success, which is still being used by many practitioners, is the completion of an activity while satisfying the three project constraints, namely, cost, time and performance. However, cost, time and performance are insufficient to measure a certain project's success, as we also need to consider the stakeholder's satisfaction and the quality of the project management process (Baccarini, 1999; Schwalbe, 2004). Thus, reforming the traditional triangle (Figure 1) by involving the stakeholder's satisfaction and the quality of the project management process allows a more comprehensive conception of project success (https://www.stakeholdermap.com/project-management/project-success-factors.html [Accessed Feb 02, 2021]).

Like most construction projects in Ethiopia, hydropower projects are far from successful implementation. Almost all hydropower projects in Ethiopian Electric Power suffered from excessive cost overrun and schedule delay and Genale Dawa hydropower project was no different. To illustrate energy generation construction projects in Ethiopia with respect to schedule Gibe III hydropower project began its construction in December, 2007 and was planned to be completed in May, 2011. However, the project was actually completed in August, 2016 which means that the project has faced time overrun of five years. Tekeze hydropower project commenced its construction in June, 2002 and planned to be completed in September, 2006. It was inaugurated in November, 2009 with time over run of three years. If we consider Genale Dawa hydropower project, it was commenced in September, 2011 with total completion time of 48½ months. It is still not fully completed (96% completion) though it started partial energy production. Therefore, its time delay is almost five years. This time delay significantly affects the cost overrun of the projects which leads to 45 percent cost overrun due to price adjustment.

The literature identifies a range of success factor for a project but there is almost no research that exists which illustrates the relationship between success factors in project management arena and the implementation of the hydropower projects. This study investigated the influence of five success factors (stakeholder engagement, monitoring and evaluation system, top management support, team building and communication system) during implementation of Genale Dawa hydropower project. The five success factors selected are not unique to hydropower project implementation; however they gain importance than the others because of the specific characteristic of Genale Dawa hydropower project.

1.4 Research Objectives

1.4.1 General Objective

The general objective of the study will be to assess the factors that affect implementation of Genale Dawa hydropower project.

1.4.2 Specific Objectives

The specific objective of the study includes the following:

1) To determine how stakeholder engagement affect implementation of Genale Dawa hydropower project.
2) To assess how monitoring and evaluation system affect implementation of Genale Dawa hydropower project.
3) To establish how top management support affect implementation of Genale Dawa hydropower project.
4) To determine how team building affect implementation of Genale Dawa hydropower project.
5) To assess how communication system affect implementation of Genale Dawa hydropower project.

1.5 Research Questions

The researcher will try to address the following research questions:

1) What is the role of stakeholder engagement in the implementation of Genale Dawa hydropower project?
2) What are the effects of monitoring and evaluation system during implementation of Genale Dawa hydropower project?
3) What is the role of top management support during implementation of Genale Dawa hydropower project?
4) What are the challenges of team building in the implementation of Genale Dawa hydropower project?
5) What is the influence of communication system in the implementation of Genale Dawa hydropower project?

1.6 Significance of the Study

Findings of this study will have a substantial importance for EEP's project management office in general and the project management team involved in the construction of the Genale Dawa hydropower projects in particular and, of course, other stakeholders in identifying determinant factors that impact implementation of the hydropower projects in Ethiopian Electric power. The study is also expected to present some possible

recommendations to the organization which will enable it to enhance the capacity of power supply mainly from hydropower sources for filling the gap of highly rated national power demand and for addressing the exterior power demand market in the neighbourhood countries. Moreover, it will serve as a base for those who are interested in conducting further research works regarding the factors that affect the implementation of hydropower projects in Ethiopia as it is rarely touched.

1.7 Scope of the Study

The scope of the study included all the employer's professionals, contractor's project manager and department heads, and consultants that took part in the implementation of Genale Dawa hydropower project. The study could be applied to any energy generation construction project having similar situation. However, due to time and money resource constraints, the scope of the research was limited to Genale Dawa hydropower project as a case study.

1.8 Limitation of the Study

As almost there was no research done on Factors Affecting Implementation of Hydropower Projects in Ethiopian Electric Power, lack of related research while doing the literature review was one of the challenging limitations faced by the researcher.

1.9 Organization of the Study

This study is organized in five chapters with each chapter covering relevant sections of the research work from the background of the study, problem conceptualization through to data collection, analysis and report writing. Specifically, chapter one gave a brief introduction of background of the research study, statement of the research problem, the purpose of the study, the objectives of the study, importance of the study to the various parties, scope and limitation/delimitation of the study. Chapter two covered the relevant literature to the research study by other scholars who have carried out research or published books and journals in the same field of study. The theoretical, empirical and conceptual reviews are carried out.

Chapter three described the research methodology which covered the methods and procedures used in conducting the study. The chapter explained the research design, target population, sample size and sampling techniques, data collection procedures, analysis and presentation of results. Chapter four dealt with the study findings and interpretations of the results and finally chapter five winded up with the summary of the findings, conclusions and recommendations.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction to Literature Review

This chapter presents review of related theories in project management; review of previous literatures focusing on the factors affecting the implementation of projects in general and energy generation construction projects in particular; and the conceptual framework is derived at the end.

2.2 Theoretical Review of the Literature

2.2.1 Concepts of Project and Project Management

PMI (2017) defined project as a temporary endeavor undertaken to create a unique product, service, or result. According to PMI (2017), the temporary nature of projects indicates that a project has a definite beginning and end while unique means that the product, service or result is different in distinguishing way from other products, services or results due to the different location, different design, different circumstances and situations, different stakeholders, and so on. Hence, a project should have definite starting and ending points, a budget, a clearly defined scope or magnitude of work to be done, and specific performance requirements that must be met. According to Kerzner (2017), project can be considered as a series of activities and tasks that have specific objective to be completed within certain specifications, defined start and end dates, funding limits, consumed human and nonhuman resources and are multifunctional.

2.2.2 Project Success

Although project success is a core project management concept, a review of the project management literature reveals that there is no standardized definition of a 'project success' in the project management literature (Baccarini, 1999). The success of a project is perceived differently by different success assessors (Shenhar et al., 2001). Therefore, as Prabhakar (2008, p. 3) noted 'the only agreement seems to be the disagreement on what constitutes project success'.

According to Pinto & Slevin (1988) based on their study conducted with over 650 project managers, the 'project success' is not only meeting cost, schedule, and performance requirements rather it requires satisfaction of more complex specifications, such as client satisfaction. Baker, Murphy and Fisher (1983, 1988 as cited in Prabhakar, 2008 and Cooke-Davies, 2001) discuss that client satisfaction has been achieved together with the end result has a vital influence on the perceived success or failure of projects (Prabhakar, 2008). In a similar fashion, Baker, Murphy and Fisher (1983, 1988 as cited in Prabhakar, 2008, page 4) note that: "In the long run, what really matters is whether the parties associated with, and affected by, a project are satisfied. Good schedule and cost performance means very little in the face of a poor performing end product"

Project success is among the few most frequently discussed project management concerns, yet it is the least agreed upon. Project managers tag some projects successful even though they have been poorly received by the intended clients and used well below capacity. Yet some projects exist which when first installed, were perceived as failures but have come to be viewed as major successes with time. Dvir (2005) opined in a study that project success are usually measured in terms of meeting planning goals, customer benefitting and overall measure of success. Pinto and Slevin (1988) observed that project managers are constrained either by company policy or personal rule of thumb to resort to simplistic formula in rating project success or failure.

A study by Baker (1988) strongly confirms the importance of including client satisfaction within any measure of project success. After sampling six hundred and fifty (650) project managers, the researcher concluded that project success is something much more than simply meeting cost, schedules and performance specifications.

2.2.3 Project Implementation

Project implementation also referred as project execution, is a phase in which the project vision and all the plans of the project become a reality and financial resources of the project are allocated. Many projects fail during implementation and often lack to meet the local people's needs or the beneficiaries need (John, Agnes, 2016)

According to Jugdev and Muller (2005), the project implementation process is complex, usually requires extensive and collective attention to a broad aspect of human, budgetary

and technical variables. In addition, projects often possess a specialized set of critical success factors in which if addressed and attention given will improve the likelihood of its successful implementation.

2.2.4 Background to Renewable Sources of Energy

In 2012 renewable energy sources accounted for approximately 19% of the world's total energy consumption (REN21, 2014). Of this total, traditional biomass, which currently is used primarily for cooking and heating in remote and rural areas of developing countries, accounted for about 9%, and modern renewables increased their share to approximately 10%. Hydropower is a renewable source of energy. In 2012 hydropower provided 3.8% of the world's energy consumption (REN21, 2014). In terms of the world's electricity supply hydropower accounts for approximately 16% by the year 2013.

In the past decade international funding agencies, such as the World Bank, have started to increase their lending for hydropower schemes (World Bank, 2009) from the low levels recorded in the late 1990s and early 2000s. This has been driven by demand from developing countries and hydropower's multi-dimensional role in poverty alleviation and sustainable development (World Bank, 2009). Hydropower also offers a hedge against volatile energy prices and risks associated with the imported supply of electricity (World Bank, 2009). In the ten years, policy support and investment in renewable energy have continued to focus primarily on the electricity sector (REN21, 2014). Consequently, renewables have accounted for a growing share of electricity generation capacity added globally each year.

2.2.5 Background to Hydropower Plants

Hydroelectricity is generated by water falling under the force of gravity that turns the blades of a turbine, which is connected to a generator. Electricity generated by the spinning turbine passes through a transformer and out to transmission lines supplying domestic and industrial demands. The principle and the technique for generating electricity from hydropower is the same regardless of the size of the project, and plants can be tailor-made to fit a community, country or an export market. The amount of power that can be generated is dictated by the following:

- ❖ The vertical height of water above the turbines, often referred to as the hydraulic head
- ❖ The rate of flow through the turbines

Hydropower is an efficient form of energy generation. Typically the efficiency of a modern day hydropower plant in converting potential energy to electrical energy is about 90% (USBR, 2005). There are three main types of hydropower plants:

- ➢ **Storage Type**
- ➢ **Run of River Type**
- ➢ **Pumped Storage Type**

Storage schemes have a dam that impounds water in a reservoir that feeds the turbine and generator. Storage schemes generally have higher environmental and social costs than pumped storage or run of river schemes because more land is inundated and the natural flow regime is disrupted (Ledec and Quintero, 2003; Lindström and Granit, 2012). Turbines can be located at the base of the dam or some distance downstream, served by penstocks or tunnels that convey the water to them and increase the effective head above the turbine. Generally storage schemes are used to supplement the base load and balance the peak loads.

Run of river hydropower plants have either no storage at all, or a limited amount of storage, referred to as pondage. A plant without pondage has no storage and is subject to variability in river flows whilst a plant with pondage can regulate water flow to some extent. Run of river plants alter the flow regime of a river to a lesser degree than storage schemes. They are generally considered to have a lower environmental impact than hydropower schemes that utilise large reservoirs (Lindström and Granit, 2012). Run of river plants are generally only appropriate for rivers with a sufficiently high minimum dry weather flow or those regulated by a much larger dam and reservoir upstream.

Pumped storage hydropower plants are designed solely to store energy to provide power during peak loads (i.e. to balance peak loads). Pumped storage facilities offer the flexibility to supplement other electricity supplies at very short notice. This form of hydropower is of increasing importance because it can balance load differences on power grids more effectively than technologies that typically supply base load such as conventional thermal energy or nuclear power generation (Levine, 2003). During off-

peak hours, such as between midnight and 6 am, excess electricity produced by conventional power plants is used to pump water from lower- to higher-level reservoirs. During periods of highest demand, the water is released from the upper reservoir through turbines to generate electricity. This has the additional benefit of using electricity to pump uphill when it is lower cost and generate when it is higher cost, generating revenue through the cost differential. The combined use of pumped storage facilities with other types of electricity generation creates large cost savings through more efficient utilization of base load plants.

2.2.6 Energy of Hydropower

Water is the most important natural resource for all living species. The origin of civilization is closely interconnected with water use and throughout history humans have developed technologies to exploit water for use in agriculture, households, transport, recreation, industry, and energy production. This research study focuses on the role of water as an energy resource namely hydropower.

Worldwide, hydro is an important source of sustainable power supply and its role is expected to increase, especially in developing countries. Hydropower is a crucial power supply contributing about 16 percent of the global electricity.

Hydropower plants play an important role to cover the annual demand in Ethiopia. The existing hydropower generation fleet includes reservoir (Dam) and run of river power plants (RoR): 85% of the installed capacity is from power plants with dam and the 15% from medium and small run of river power plants (small hydro power plants assumed as RoR power plants). In the future new big reservoir power plants are foreseen (the biggest one is Grand Renaissance power plant) together with small hydro units distributed.

2.2.7 Hydropower Generation

The waters of lakes, reservoirs located at high elevation and water flowing in a river all provides potential energy or kinetic energy. The energy produced by water is termed water power. Power generation methods which produce electric energy by using water power are called hydropower generation (IHR, 2018).

2.2.8 Electric Power Output

Hydro power plants are equipped with turbines and generators which are turned by water power to generate electric power. Here, the water power is first converted into mechanical energy then into electric energy. In this form of energy conversion process, there is a certain amount of energy loss due to the turbine and generator. The power output is expressed by the following equation (IHR, 2018).

$$P=\rho 9.8QHe\eta$$

where,

P: Power output (kW)

ρ: Water density = 1,000kg/m^3 (at 4ºC, elevation 0m and 1atm)

9.8: Approximate value of free fall acceleration (m/sec^2)

Q: Power discharge (m^3/sec)

He: Effective head (m)

η: Combined efficiency of turbine and generator

2.3 Empirical Review of the Literature

2.3.1 Factors Affecting the Project Success

The concept of "success factors" was coined in 1961 by D. Ronald Daniel of McKinsey & Company, it was refined into critical success factors in1981 by John F Rockart, since then many authors have published lists of critical success factors (CSFs). Rockart JF (1979), defined critical success factors as "the limited number of areas in which satisfactory results will ensure successful competitive performance for the individual, department or organization". Baccarini and Collins (2003), see a project's critical success factors as "important influences that contribute to project success".

The study focused on five factors which are assumed to be most important influential factors in the implementation of Genale Dawa hydropower project. These factors are; stakeholder engagement, monitoring and evaluation system, top management support, team building and communication system.

2.3.1.1 Stakeholder Engagement as a Project Success Factor

Regardless of the type of project, decisions regarding the degree of participation from various stakeholders are a significant issue that project management should consider. Project stakeholders include all members of the project team as well as all interested parties that are both internal and external to the organization. It is the duty of the project team to identify internal and external, positive and negative, and performing and advising stakeholders in order to determine the project requirements and the expectations of all the parties involved (Williams, 2008).

Project stakeholders have varying levels of authority and responsibility when participating in a project. This level changes over the course of the project's life cycle. Their involvement may range from occasional contributions during needs assessment, participation in specific activities, to full project sponsorship which includes providing financial, political or other support. On the other hand, some stakeholders may also detract from the success of the project, either passively or actively. These stakeholders require the project manager's attention throughout the project's life cycle as well as planning to address any issues they may arise.

Stakeholder involvement is critical to the success of every project in every organization. To create a sense of ownership, stakeholders should be involved fully in the project meant to solve their needs. Stakeholders have power to influence the project outcome either positively or negatively (Kobusingye, Kyalo, & Mulyungi, 2017).

2.3.1.2 Monitoring and Evaluation as a Project Success Factor

Project monitoring is a process of gathering information to compare the actual use of project inputs and completed outputs with the planned use of inputs and completed outputs, while Project evaluation is the gathering information to assess the effects and impact of a project (Attenborough, 2007; Armitage, 2008; Broerse 1998).

Monitoring is the continuous assessment of a programme or project in relation to the established schedule. It is a management tool that provides continuous feedback on the project implementation as it identifies potential successes and constraints that may guide in timely decisions. Monitoring assesses physical and financial progress of project or programme activities against established schedules and indicators of success; it assesses

process which account for progress of activities or success of output production. It also assesses the impact by measuring the initial responses and reactions to project activities and their immediate short-term effects. Projects are monitored to ensure; stakeholders understands the project; to minimize the risk of project failure; to promote systematic and professional management; and to assess progress in implementation (Zweekhorst, 2004; Cartland et al., 2008)

Evaluation is a process which determines systematically and objectively the relevance, effectiveness, efficiency, sustainability and impact of activities in the light of a project/programme performance, focusing on the analysis of the progress made towards the achievement of the stated objectives (Burke, 1989; Cabrera, Colosi & Lobdell, 2008)

2.3.1.3 Top Management Support as a Project Success Factor

Top management support and commitment are critical to achieve success in the project. According to Green (1995) top management includes the CEO and his/her direct subordinates all those who are responsible for corporate policy. Top management support is needed throughout the implementation of the project (Easteves and pastor, 2000, Nah, 2001). Top management support refers to both the nature and amount of support the project manager can expect from management both for himself as leader and for the project. As noted by Schultz and Slevin (1975), management support for projects, or indeed for any implementation, has long been considered of great importance indistinguishing between their ultimate success or failure. Beck (1983) sees project management as not only dependent on top management for authority, direction and support, but as ultimately the conduit for implementing top management's plans, or goals, for the organization.

Top management support has been consistently identified as the most important and crucial success factor in project implementation (Somers & Nelson 2003). Slevin & Pinto 1996 define top management to provide the necessary resources and authority or power for project success. Top management support in project implementation has two main facets: One providing leadership; and two providing the necessary resources. To implement project successfully, management should monitor the implementation progress and provide clear direction of the project.

They must be willing to allow for a mindset change by accepting that a lot of learning has to be done at all levels, including themselves (Rao, 2000). Easteves and pastor (2000) stated that sustained management support is related with sustained management commitment, both at top and middle levels during the implementation, in terms of their own involvement and the willingness to allocate valuable organizational resources. Management support is important for accomplishing project objectives and aligning these with strategic business goals. Bingi et. al. (1999) mention that top management need to constantly monitor the progress of the project and provide direction to the implementation teams (Sabina W., Harriet K. and Jesse M, 2015).

2.3.1.4 Team Building as a Project Success Factor

Team building is the process of taking a collection of individuals with different needs, backgrounds and expertise and transforming them by various methods into an integrated, effective work unit. In this transformation process, the goals and energies of individual contributors merge and support the objectives of the team.

Many literatures indicate team building as a determinant of project success. According to Lewis (2002) stressed on the need to turn a project group into a team and says “teams don't just happen. They must be built! However, far too little attention is paid to team building in project management.” Roe (2014) and Deloitte (2013) revealed that having clear structures and responsibilities for decision making in place, with clear reporting lines between individuals and groups involved in project management and delivery and governance-direction and oversight of projects are amongst the critical factors for the success of a project.

Calleam Ltd (2015) indicated that lack of clear roles and responsibilities (which result in confusion, errors and omissions), insufficient team members to complete the work that has been committed to and a team lacking the subject matter expertise are amongst the factors that affect successful completion of projects. Ioana (2015) revealed a positive relation between having a properly defined roles and responsibilities and project success. Dugger (2007), Gow&Morss (1988) and Ika (2010) cited in Ika (2012) revealed that delays in appointing personnel, or ineffective use of those appointed, which was true almost four decades ago, still remains to be a determinant of project success in Africa.

2.3.1.5 Communication System as a Project Success Factor

Successful project management communication is about being there for everyone, being in touch with the real challenges of the project, understanding the real issues within the team who must deliver the project as well as understanding the issues of the sponsors who the team delivers the project for. Being present, visible and engaged with everyone is important – during the good times and the challenging times.

Communication is not only about speaking to and hearing from people, it's about understanding the complete message. What language to use, how to convey the message with respect to tone, feeling and body language all play an important role in the communication process. If these are used incorrectly, the result is often a confused message and misunderstanding of the real issues. So, a successful project manager can only maximise the effectiveness of communication within the team by being prepared to lead by example. A big part of leadership is to be present, and be prepared to communicate with all stakeholders at their respective levels.

Projects often 'fail' because we simply fail to clearly articulate the vision and the project's success criteria. This vision must be successfully communicated to each stakeholder and team member. The whole team should be able to visualize the end result, in order to work towards a common goal.

The need for adequate communication channels is extremely important in creating an atmosphere conducive enough for successful project implementation. Communication as Pinto and Slevin (1988) opined is not only essential within the project team itself, but between the team and the rest of the organization as well as with the client. Communication to provide feedback and technical evaluation to areas outside the project within the host organization tends to be highly specialized for more effectively managed research projects.

2.7 Conceptual Framework of the Study

The conceptual framework shown in Figure 2 below is a schematic diagram which illustrates the relationship between the dependent variable, that is, implementation of Genale Dawa hydropower project and the independent variable which are stakeholder engagement, monitoring and evaluation system, top management support, team building and communication system.

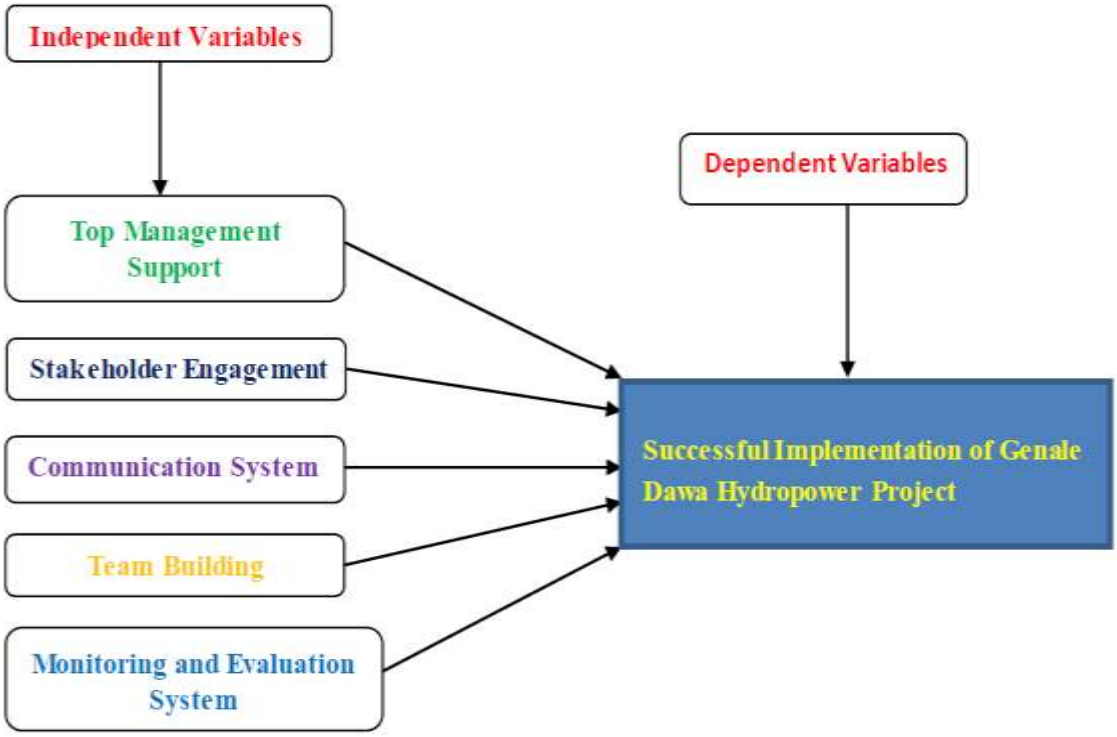

Figure 2: Conceptual Framework

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter provided an overview of the methods and procedures followed to conduct the study. It outlines the research methodology that used to answer the research questions. The research methodology includes research design, target population, sampling design which includes the sampling frame, sampling technique, and finally the data analysis methods employed in the study. In short, the research identified the procedures and techniques used in the collection, processing and analysis of data.

3.2 Research Approach

The research approach in this study was predominantly quantitative which makes use of primary data from structured questionnaire and qualitative data from structured interview to answer the research questions and hence achieve the study objectives. Therefore, the study used mixed approach.

3.3 Research Design

The research design refers to the overall strategy that we choose to integrate the different components of the study in a coherent and logical way, thereby, ensuring we will effectively address the research problem; it constitutes the blueprint for the collection, measurement, and analysis of data (www. libguides.usc.edu/writingguide/researchdesigns [Accessed 10 Jan 2021]). According to Trochim (2005), research design provides the glue that holds the research project together. A design is used to structure the research, to show how all of the major parts of the research project work together to try to address the central research questions.

The study adopted a descriptive research design as it seeks to determine the factors affecting implementation of projects in Genale Dawa hydropower project. Descriptive survey is a method of collecting information by interviewing and administering questionnaires to a sample of individuals (Orodho, 2003; Kothari, 2003). Descriptive

survey enables the collection of information through questionnaires to determine the opinions, attitudes, preferences and perceptions of persons of interests to the research (Borg, 1987).

3.4 Population and Sampling

3.4.1 Target Population

A research population is generally a large collection of individuals or objects that is the main focus of a scientific query. It is for the benefit of the population that researches are done. However, due to the large sizes of populations, researchers often cannot test every individual in the population because it is too expensive and time-consuming. This is the reason why researchers rely on sampling techniques.

The target population for the study was a total of 35 people from Ethiopian Electric Power (EEP) employees, consultant, contractor and local community who are directly involved in the Genale Dawa hydropower project and who have better understanding of the project implementation as they have participated during the execution of the project. The target population consisted of the project manager of the client, the resident engineer of the consultant, different professionals who took part during the project implementation.

It also consisted of four representative persons from the nearby communities of the Bale zone and Guji zone in Oromia Regional State to include the wider perspective of stakeholders in environmental and social impact assessment who has led the project to significant cost overrun and delay in schedule. The researcher also have structured interview with the contractor's project manager and different department heads to investigate the factors which had impact during the project implementation from the contractor's point of view. A questionnaire was sent the following list through email.

Table 3.4: List of questionnaire respondents

Title/Position	Number	Remark
Questionnaire & Interview		
Project Manager	1	
Contractor's Site Manager	1	
Civil Works Head	1	
Geotechnical Head	1	
Electromechanical Head	1	
Project Resident Engineer	1	
Contract Administration Team	5	Consists of five senior engineers; one each from civil, hydraulics, electrical, mechanical and geology
Construction Supervision Team	20	Electrical Engineers = 4 Mechanical Engineers = 4 Civil Engineers = 5 Geologists = 3 Environmentalists = 2 Sociologists = 2
Community representatives from Bale and Guji zone of Oromia regional state	4	Two community leaders from each zone

3.4.2 Sampling Technique

The researcher used nonrandom sampling technique, that is, purposive sampling. The reason for selecting this purposive sampling is to select participants that have directly involved during the implementation of Genale Dawa hydropower project. As the target population for the study is easily manageable there was no need to take sample for the questionnaire. But, for the interview purpose the sample size was a total of 5 peoples.

3.5 Data Analysis

After the data was collected from primary sources by collecting the questionnaires it was checked and edited to detect errors that would have been committed by the respondents. Then, the edited data was coded and entered in to the statistical package for social science (SPSS) computer software and get analyzed through descriptive statistics.

3.6 Validity of the Study

Validity refers to the degree to which a study accurately reflects the specific concept that the researcher is attempting to measure or describe. The validity of research is conceived as the precision or correctness of the research finding. A number of measures were taken to enhance the validity of the research. First, the researcher has already identified the study target carefully. Second, structured questionnaires and interviews survey was used and the questionnaires of the study was reviewed and commented by randomly selecting senior managers and finally Likert was used in the survey instruments.

3.7 Ethical Considerations

Ethical issues can be specified as one of the most important parts of a research. Thus, the researcher had an ethical responsibility to do his study honestly and with integrity. In doing this research, participants were given appropriate information about the purpose and intended uses of the research, and after receiving informed consent from participants the questionnaire and interview was conducted. They were also made aware of their right to refuse participation whenever and for whatever reason they wish. The identity of individuals participated in the research will be protected at all times through confidentiality and names will not be mentioned in the study. Moreover, the researcher assured that the data obtained from the interviewees will be used only for this study. The researcher will not modify and/or change findings to meet his and/or participants' needs. Therefore, the researcher believed that the study will not be raising any ethical anxiety.

CHAPTER FOUR: DATA ANALYSIS, PRESENTATION AND INTERPRETATION

4.1 Introduction

This chapter presents the data analysis and discussion of the research findings. For the purpose of this study, the descriptive survey method was adopted and data were obtained by means of inquiries using questionnaires and interviews.

Qualitative data from the interview was analyzed through narrative analysis method. The qualitative data presented by interviewee, context of each case and different experiences of each respondent was taken into account. The quantitative data analysis was made with the help of Statistical Package for Social Science (SPSS) version 20 computer software. On the basis of the analysis, the study concluded final decisions of the result of the discussion by taking 3 as average mean for the sake of descriptive analysis. An average mean result of above 3 is considered as satisfactory whereas an average mean of below 3 is regarded as unsatisfactory. Finally, the response obtained from the interview part is incorporated as descriptive part of the analysis.

4.2 Response Rate

A total of 35 questionnaires were sent through email to purposively selected employees who have participated during the implementation of Genale Dawa hydropower and 30 questionnaires were properly filled and returned which is 86% response rate.

4.3 Demographic Characteristics of the Respondents

The study sought to establish the demographic characteristics of the respondents based on gender, age, marital status, educational qualification and work experience. The importance of this is to know whether the employees are well educated and have enough knowledge and skills to facilitate the implementation of Genale Dawa hydropower project, all this are further discussed in sub thematic areas.

Table 4.1: Respondents Distribution by Gender (Own Source, 2021)

		Frequency	Percent	Cumulative Percent
	Male	27	90.0	90.0
	Female	3	10.0	100.0
	Total	30	100.0	

The above table shows that 27 of the respondents (90%) were male and the remaining 3(10%) of them were females which obviously shows that the majority of the respondents were male.

Table 4.2: Respondents Distribution by Age Category (Own Source, 2021)

	Frequency	Percent	Cumulative Percent
20-30 Years	1	3.3	3.3
31-40 Years	24	80.0	83.3
41-50 Years	5	16.7	100.0
Total	30	100.0	

As shown in the table 4.2 above, 3.3% of the respondents were 20-31 years, 80% of the respondents were between the ages of 31-40 years and 16.7% of the respondents were between 41-50 years. Based on the findings, the majority of the respondents were between the ages of 31-40 years. This would suggest that majority of the respondents were able to appreciate and understand the project implementation challenges.

Table 4.3: Marital Status of Respondents (Own Source, 2021)

	Frequency	Percent	Cumulative Percent
Single	6	20.0	20.0
Married	23	76.7	96.7
Separate	1	3.3	100.0
Total	30	100.0	

Regarding the marital status as shown in table 4.3, 23(76.7%) of the respondent are married, 6(20%) of the respondents are single and 1(3.3%) is single.

Table 4.4: Educational Qualification of Respondents (Own Source, 2021)

	Frequency	Percent	Cumulative Percent
Masters	9	30.0	30.0
First degree	21	70.0	100.0
Total	30	100.0	

As far as the educational qualification of the respondents, 21(70%) of them have first degree and the remaining 9(30%) have a master degree as shown in table 4.4 above.

Table 4.5: Work Experience of Respondents (Own Source, 2021)

	Frequency	Percent	Cumulative Percent
5-10 Years	7	23.3	23.3
11-15 Years	21	70.0	93.3
Above 15 Years	2	6.7	100.0
Total	30	100.0	

In terms of work experience, 2(6.7%) of the total respondents have more than 15 years of experience, 21(70%) between 11 and 15 years of experiences, 7(23.3%) between 5 and 10 years of experience as shown in table 4.5 above.

4.4 Descriptive Statistics of Dependent and Independent Variables

4.4.1 Stakeholder Engagement

Regardless of the type of project, decisions regarding the degree of participation from various stakeholders are a significant issue that project management should consider. Project stakeholders include all members of the project team as well as all interested parties that are both internal and external to the organization. Project stakeholders have varying levels of authority and responsibility when participating in a project. This level changes over the course of the project's life cycle.

The respondents were asked to indicate their level of agreement (1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree) with the statements listed on Stakeholder Engagement on the implementation of Genale Dawa hydropower project. Their responses are summarized in the table below.

Table 4.6: Respondents' View on Stakeholder Engagement (Own Source, 2021

Descriptive Statistics of Stakeholder Engagement								
Statements	**N**	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**	**Mean**	**Std. Deviation**
Project stakeholders are identified regularly and their interests, involvement, interdependencies, influence, and potential impact on the project success has been analyzed	30	10.0%	63.3%	26.7%	0.0%	0.0%	2.17	0.59
Project stakeholders have been communicated to meet their needs and expectations, address issues, and foster appropriate involvement	30	50.0%	16.7%	23.3%	6.7%	3.3%	1.97	1.16
Approaches to involve project stakeholders based on their needs, expectation, interests, and potential impact on the project has been developed	30	23.3%	66.7%	6.7%	3.3%	0.0%	1.90	0.66
Average							**2.01**	**0.63**

According to the results in Table 4.6, majority of the respondents who represented 63.3% of the respondents agreed that project stakeholders are not identified regularly and their interests, involvement, interdependencies, influence, and potential impact on the project success has not been analyzed, 10.0% strongly agreed that project stakeholders are not identified regularly and their interests, involvement, interdependencies, influence,

and potential impact on the project success has not been analyzed and 26.7% were neutral. In general, 73.3% of the respondents agreed that project stakeholders are not identified regularly and their interests, involvement, interdependencies, influence, and potential impact on the project success has not been analyzed. Similarly, the above results also indicated that 66.7% of the respondents agreed that project stakeholders have not been communicated to meet their needs and expectations, address issues, and foster appropriate involvement and 90.0% of the respondents agreed that approaches to involve project stakeholders based on their needs, expectation, interests, and potential impact on the project has not been developed.

On a five-point scale, the average mean of the responses was 2.01 which means that majority of the respondents disagreed with most of the statements regarding the stakeholder engagement in Genale Dawa hydropower project.

The respondents from the interview question also stated that there was minimal stakeholder engagement. Out of the many stakeholders of the project, local communities in the Guji and Bale zone of Oromia Regional State were not properly handled by the project office in particular and Ethiopian Electric Power in general. The respondents explained, the hydropower project needs tens of thousands hectare for the dam reservoir and as a result there was huge compensation and resettlement works.

The farmers and pastoralists around the hydropower project need to be compensated for every loss due to the project. Then, before they are displaced from their original home infrastructures must built in the new resettlement area. But this compensation and resettlement work was ignored by the project office/Ethiopian Electric Power which leads to conflict with the local communities. As a result, the local communities stopped the activities of the contractors for months. EEP totally showed no progress for years to resolve the compensation and resettlement works and finally the issue was resolved at higher management level.

The top management of EEP together with Ministry of Water, Irrigation and Energy (MoWIE) directly talked to the Oromia Regional State president office to close the issue. As the compensation and resettlement works took more five years, there was extraordinary increase in the compensation amount paid as compared to the estimated cost during the feasibility study. The compensation amount in the feasibility study was

around 224, 000, 000 ETB. But the compensation amount paid by the project office was 2,900,000,000 ETB. The respondents explained as the feasibility study was conducted 20 years before and some price escalation in the compensation amount is expected, this much actual increment comes because of improper handling of the local communities. EEP didn't give attention at all. This leads for the compensation and resettlement works to go out of control and the local communities were united to force EEP pay that much compensation amount.

4.4.2 Monitoring and Evaluation System

Project monitoring is a process of gathering information to compare the actual use of project inputs and completed outputs with the planned use of inputs and completed outputs, while project evaluation is the gathering information to assess the effects and impact of a project. Monitoring is the continuous assessment of a programme or project in relation to the established schedule. It is a management tool that provides continuous feedback on the project implementation as it identifies potential successes and constraints that may guide in timely decisions. Evaluation is a process which determines systematically and objectively the relevance, effectiveness, efficiency, sustainability and impact of activities in the light of a project/programme performance, focusing on the analysis of the progress made towards the achievement of the stated objectives.

The respondents were asked to indicate their level of agreement (1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree) with the statements listed on Monitoring and Evaluation System on the implementation of Genale Dawa hydropower project. Their responses are summarized in the table in the next page.

Table 4.7: Respondents' View on Monitoring and Evaluation System (Own Source, 2021)

Descriptive Statistics of Monitoring and Evaluation System								
Statements	**N**	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**	**Mean**	**Std. Deviation**
There were good practice of developing monitoring and evaluation schedule	30	20%	56.7%	16.7	6.7%	0.0%	2.10	0.80
Monitoring and evaluation reports have been used for decision making	30	46.7%	30%	16.7%	3.3%	3.3%	1.87	1.04
Standard template have been used for monitoring and evaluation during Genale Dawa hydropower project implementation	30	13.3%	63.3%	20%	3.3%	0.0%	2.13	0.68
Average							**2.03**	**0.68**

According to the results in Table 4.7, majority of the respondents who represented 56.7% of the respondents agreed that there were no good practice of developing monitoring and evaluation schedule, 20.0% strongly agreed that there were no good practice of developing monitoring and evaluation schedule, 16.7% were neutral and while 6.7% agreed that there were good practice of developing monitoring and evaluation schedule. In general, 76.7% of the respondents agreed that there were no good practice of developing monitoring and evaluation schedule. Similarly, the above results also indicated that 76.7% of the respondents agreed that monitoring and evaluation reports have not been used for decision making and 76.7% of the respondents agreed that standard template have not been used for monitoring and evaluation during Genale Dawa hydropower project implementation.

On a five-point scale, the average mean of the responses was 2.03 which mean that majority of the respondents disagreed with most of the statements regarding the monitoring and evaluation system in Genale Dawa hydropower project.

The respondents during the interview question explained that there was little monitoring and evaluation system during the project implementation. The client and consultant were

not powerful during the project implementation. They were not actively monitoring and evaluating the project progress. The contractor was not inviting the client and consultant during each and every project activity. The contractor invites them for confirmation after he completed some deliverables. If the consultant makes some disagreement with the quality of the work and advises some recommendation, the contractor was mostly not in a position to accept such remedial actions. The contractor mostly ignores the consultant's comments and continues to the next phase.

During the 110m dam construction, for example, the contractor was using lower quality of rock fills. Even though the consultant repeatedly insists the contractor to use the correct grade of rock fills, the contractor refused to correct it. Finally, the consultant clashed with the contractor at the dam site. The consultant was powerless and hence the monitoring and evaluation system was so weak. The Chinese contractor bypass EEP top managements and directly go to higher government officials like the MoWIE for appeal if the consultant became so resistant. The contactor biases the higher government officials through his diplomacy organ and then the higher government officials warns the consultant being obstacle and delaying the project.

4.4.3 Top Management Support

Top management includes the chief executive officer and his/her direct subordinates all those who are responsible for corporate policy. Top management support is needed throughout the implementation of the project. Top management support refers to both the nature and amount of support the project manager can expect from management both for himself as leader and for the project. Top management support is critical to achieve success in the project.

The respondents were asked to indicate their level of agreement (1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree) with the statements on top management support on the implementation of Genale Dawa hydropower project. Their responses are summarized in the table in next page.

Table 4.8: Respondents' View on Top Management Support (Own Source, 2021)

Descriptive Statistics of Top Management Support								
Statements	**N**	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**	**Mean**	**Std. Deviation**
There was guidance from EEP top management support for the implementation of Genale Dawa hydropower project	30	23.3%	53.3%	23.3%	0.0%	0.0%	2.00	0.69
Top management of the EEP has willing to provide the necessary resources and authority power for the successful implementation of Genale Dawa project	30	30.0%	46.7%	23.3%	0.0%	0.0%	1.93	0.74
Top management of the EEP was able to make effective leadership and decision making	30	20.0%	60.0%	16.7%	0.0%	3.3%	2.07	0.83
Average							**2.00**	**0.62**

According to the results in Table 4.8, majority of the respondents who represented 53.3% of the respondents agreed that there was no guidance from EEP top management for successful completion of Genale Dawa project implementation, 23.3% strongly agreed that there was no guidance from EEP top management for successful completion of Genale Dawa project implementation and 23.3% agreed there was guidance from EEP top management for successful completion of Genale Dawa project implementation. In general, 76.7% of the respondents agreed that there was no guidance from EEP top management for successful completion of Genale Dawa project implementation. Similarly, the above results also indicated that 76.7% of the respondents agreed that top management of the EEP has no willing to provide the necessary resources and authority power for the successful implementation of Genale Dawa project and 80% of the

respondents agreed that top management of the EEP was not able to make effective leadership and decision making.

On a five-point scale, the average mean of the responses was 2.00 which mean that majority of the respondents disagreed with most of the statements regarding the top management in Genale Dawa hydropower project.

This goes with the interview question respondent's stand on how the top management support during the implementation of Genale Dawa hydropower project was. The respondents of the interview question stated that the top management of the Ethiopian Electric Power (EEP) did not involve during the implementation of the project. There were many issues which need the approval from the top management of EEP. There were major scope changes in the project which need top management to proceed. For example, the type of the dam was changed from Roller Compacted Concrete (RCC-type) to Concrete Faced Rock Fill Dam (CFRD-type) and the transmission and substation voltage level was changed from 230kV to 400kV.

These two scopes were not simple but have significant implication on the project layout and related design change. Since the top management of EEP was very reluctant to give attention to this project, the contractor was forced to suspend many construction works and design change. As these two scope changes had major cost reflection in the project there was much dispute between the contractor and EEP. It took them almost two years to reach agreement in both scope changes.

Again after these scope changes were settled and agreed and the voltage level was raised from 230kV to 400kV another scope change followed. This scope change came to exist due to the raised voltage level which was not seen during the first two scope changes dispute resolution time. This scope change was to install three shunt reactors in the three outgoing 400kV transmission lines to Yirgalem substation at Sidama Regional State to regulate the system voltage stability. This scope change again took another one year to resolve.

These all scope changes and other unexplained ones came with direct project cost variation and due to excessively delayed scope change negotiation it also resulted in much project price adjustment as the material cost in the international market increased compared the contract signing date. Generally speaking, the respondents stated that the

top management of EEP were not giving guidance, attention and effective decision making during the implementation of Genale Dawa hydropower project.

4.4.4 Team Building

Team building is the process of taking a collection of individuals with different needs, backgrounds and expertise and transforming them by various methods into an integrated, effective work unit. In this transformation process, the goals and energies of individual contributors merge and support the objectives of the team. Many literatures indicate team building as a determinant of project success.

The respondents were asked to indicate their level of agreement (1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree) with the statements listed on Team Building on the implementation of Genale Dawa hydropower project. Their responses are summarized in the table below.

Table 4.9: Respondents' View on Team Building (Own Source, 2021)

Descriptive Statistics of Team Building								
Statements	**N**	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**	**Mean**	**Std. Deviation**
There was trust and values within the Genale Dawa hydropower project implementation team	30	0.0%	13.3%	73.3%	10%	3.3%	3.03	0.62
Genale Dawa hydropower project team understands the goals and objectives of the project implementation	30	0.0%	30%	60%	10%	0.0%	2.80	0.61
The team members were willing to carry out their roles and responsibilities effectively	30	0.0%	10%	73.3%	16.7%	0.0%	3.07	0.52
Average							**2.97**	**0.33**

According to the results in Table 4.9, majority of the respondents who represented 73.3% of the respondents feel neutral that there was trust and values within the Genale Dawa hydropower project implementation team, 13.3% disagreed, 10% agreed while 3.3% strongly agreed. In general, 73.3% of the respondents feel neutral that there was trust and values within the Genale Dawa hydropower project implementation team. Similarly, the above results also indicated that 90% of the respondents feel neutral that Genale Dawa hydropower project team understands the goals and objectives of the project implementation and 83.3% of the respondents feel neutral that the team members were willing to carry out their roles and responsibilities effectively.

On a five-point scale, the average mean of the responses was 2.97 which means that majority of the respondents feel neutral with most of the statements regarding the team building in Genale Dawa hydropower project.

The respondents from the interview question also explained the project team was to some extent devoted. But the condition at the project site was not attractive and there was frequent turnover of the employees. They were not being trained and treated properly.

4.4.5 Communication System

The need for adequate communication channels is extremely important in creating an atmosphere conducive enough for successful project implementation. Communication is not only essential within the project team itself, but between the team and the rest of the organization as well as with the client.

The respondents were asked to indicate their level of agreement (1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree) with the statements listed on Communication System on the implementation of Genale Dawa hydropower project. Their responses are summarized in the next page.

Table 4.10: Respondents' View on Communication System (Own Source, 2021)

Descriptive Statistics of Communication System								
Statements	**N**	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**	**Mean**	**Std. Deviation**
Standardized formats and templates have been used for all formal project communications regarding with the interest of the stakeholders	30	46.7%	36.7%	13.3%	3.3%	0.0%	1.73	0.82
Performance feedback has been regularly provided to all stakeholders based on their role and responsibility	30	13.3%	80%	6.7%	0.0%	0.0%	1.93	0.45
There was clear, timely, and unambiguous communication between all parties during the project implementation	30	10%	53.3%	33.3%	3.3%	0.0%	2.30	0.70
Average							**1.97**	**0.43**

According to the results in Table 4.10, 46.7% of the respondents strongly agreed that standardized formats and templates has not been used for all formal project communications regarding with the interest of the stakeholders, 36.7% agreed that standardized formats and templates have not been used for all formal project communications regarding with the interest of the stakeholders, 13.3% were neutral and while 3.3% agreed that standardized formats and templates has been used for all formal project communications regarding with the interest of the stakeholders. In general, 83.4% of the respondents agreed that standardized formats and templates have not been used for all formal project communications regarding with the interest of the stakeholders.

Similarly, the above results also indicated that 93.3% of the respondents agreed that performance feedback has not been regularly provided to all stakeholders based on their role and responsibility and 63.3% of the respondents agreed that there was no clear, timely, and unambiguous communication between all parties during the project implementation.

On a five-point scale, the average mean of the responses was 1.99 which means that majority of the respondents disagreed with most of the statements regarding the communication system in Genale Dawa hydropower project.

Regarding the communication system, the respondents started by stating that there was no communication infrastructure at the project site. As the site is remote, there was no phone network and internet network for so long time that communication system was almost none. Similarly, the communication system among project team members and the project manager, between the site office and EEP head office, between the consultant and contractor was impaired because of the absence of the communication infrastructure.

4.4.6 Implementation of Genale Dawa Hydropower Project

A construction project is commonly admitted as successful, when it is completed on schedule, within the agreed budget, with the highest quality, in accordance with the specifications and to stakeholders' satisfaction (Tsegay & Luo, 2017; Worku & Jha, 2016).

The respondents were asked to indicate their level of agreement (1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree) with the statement listed on the implementation of Genale Dawa hydropower project. Their responses are summarized in the next page.

Table 4.11: Respondents' View on Implementation of Genale Dawa Hydropower Project (Own Source, 2021)

Descriptive Statistics of Implementation of Genale Dawa Hydropower Project								
Statements	**N**	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**	**Mean**	**Std. Deviation**
Genale Dawa hydropower project has completed on time, within budget, meets quality target and contributes to the achievement of the Ethiopia Electric Power's strategic objectives	30	13.3%	63.3%	20%	3.3%	0.0%	2.13	0.68

According to the results in Table 4.11, 63.3% of the respondents agreed that Genale Dawa hydropower project has not completed on time, within budget, meets quality target and did not contribute to the achievement of the EEP's strategic objectives, 13.3% strongly agreed that Genale Dawa hydropower project has not completed on time, within budget, meets quality target and did not contribute to the achievement of the EEP's strategic objectives, 20% were neutral and while 3.3% agreed that Genale Dawa hydropower project has completed on time, within budget, meets quality target and contributes to the achievement of the EEP's strategic objectives. In general, 76.7% of the respondents agreed that Genale Dawa hydropower project has not completed on time, within budget, meets quality target and did not contribute to the achievement of the EEP's strategic objectives.

On a five-point scale, the average mean of the responses was 2.13 which means that majority of the respondents agreed that Genale Dawa hydropower project has not completed on time, within budget, meets quality target and did not contribute to the achievement of the EEP's strategic objectives.

The respondents from the interview question also stated that Genale Dawa hydropower project has not completed on time, within budget, meets quality target and did not contribute to the achievement of the EEP's strategic objectives. The respondents said that the project was commenced at September 2009 with total contract amount of 451,000,000

USD and project completion duration of 48½ months. The project was inaugurated at 2020 with a total project cost of 750,000,000 USD. The respondents underlined that the project showed 175% schedule delay and 66% cost overrun with the current project progress (i.e., 96% completion). They explained this all cost overrun and schedule delay comes because of poor project management culture at EEP.

CHAPTER FIVE: SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

In this section, the research deals about the summary of findings, conclusions and recommendations. The researcher strived to take the summarized results of the study from the discussion of analysis part; following this, the conclusions were derived on the basis of the research objectives. In the last part of this section, the recommendation part drew from the literature and theoretical concepts context.

5.1 Summary of Major Findings

The main purpose of this study was to investigate Factors Affecting Implementation of Genale Dawa hydropower project. The findings of the study encompassed the data collected using questionnaires and analyzed through descriptive statistics, frequency distribution. The discussion attempted to accomplish the objectives of the study and answer the research questions; accordingly, the following findings were identified:

1) The result showed that 27 (90%) of the respondents were male which shows majority of the respondents were male. 80% of the respondents were between the ages of 31-40 years, 70% of the respondents have first degree and 70% have work experience between 11 and 15 years which would suggest that majority of the respondents were able to appreciate and understand the project implementation challenges of the project.
2) On a five-point scale, the average mean of the responses of the respondents with the statements regarding the stakeholder engagement, monitoring and evaluation system, top management support, team building and communication system was 2.01, 2.03, 2.00, 2.97, 1.97 respectively.
3) On a five-point scale, the average mean of the responses of the respondents with the statement regarding Genale Dawa hydropower project has completed on time, within budget, meets quality target and contributes to the achievement of the Ethiopia Electric Power's strategic objectives was 2.13.

5.2 Conclusions

Based on the findings the study concluded that the factors stakeholder engagement, monitoring and evaluation system, top management support, team building and communication system significantly affects the implementation of Genale Dawa hydropower project.

The study concluded that it was the absence of top management support of EEP that leads to the excessive cost overrun and schedule delay of the project and hence unsuccessful implementation of the Genale Dawa hydropower project. The top management of EEP took too much time to make decisions and they were not giving guidance during the implementation of the project. The study also concluded that monitoring and evaluation system of the project was inadequate in which it was very hard to follow the project progress and take some mitigation measures in case of discrepancies.

The study further concluded stakeholder engagement was so poor in general and the local communities in particular. The compensation and resettlement works of the local communities was ignored for so long time and as a result it brought huge financial burden to EEP. Finally, the study concluded that there was serious challenge regarding the communication system of the project as there was no communication infrastructure for so long time even though it is now resolved.

5.3 Recommendations

The study makes the following recommendations that will help to improve the implementation of Genale Dawa hydropower project in particular and hydropower projects in EEP in the future in general. Top management support is very crucial and mandatory in implementation of the Genale Dawa hydropower project and any other power projects in EEP. Thus, top management involvement should be taken seriously as it affected the overall success of project. The top management shall allocate adequate resources, give fast decisions, empower the project office and closely follow the project progress.

As per the analysis conducted, EEP shall always identify and properly engage all stakeholders of the project. Specially, local communities at the project site shall be given higher priority during implementation of the project.

For the project to be successful it is highly recommended that monitoring and evaluation system shall be set up during the implementation of the project to assess the project progress with respect to time, cost and quality and to propose mitigation measures ahead of time.

The communication system is one of the most important success factors that ensure delivery of information at the shortest time concerning projects. The information shall be reliable, effective and efficient. Therefore, the communication barrier and bureaucracy should be avoided; and faster and effective way of communication should be applied. The project team needs to have direct communication with the project manager and the consultant. Moreover, regular meetings shall be held on a frequent basis and project progress shall be communicated with EEP higher management.

Building competent project team is important for successful implementation of any project and the project team of Genale Dawa hydropower project shall be multidisciplinary which includes team members who are experienced and competent.

5.4 Suggestions for Further Research

The study focused on investigating the Factors Affecting Implementation of Genale Dawa hydropower project. As explained in limitation section of the study, there was no research undertaken about Factors Affecting Implementation of hydropower projects in Ethiopian Electric Power. As a result the researcher calls for further studies to be undertaken. Furthermore, the study focused on few critical success factors that affect implementation of Genale Dawa hydropower project and it could not exhaustively examine all critical success factor that affect implementation the project due time and budget constraint. Therefore, there is a need for more research which will be inclusive of as much critical success factors as possible that affect implementation of the project.

References

Abdullahi, G., Mburu, D. (2017). Factors Affecting Effective Implementation of Wind Power Projects in Kenya, International Journal of Entrepreneurship and Project Management [online] Available at: https://www.researchgate.net/publication/313180605 [Accessed 21 Jan. 2019].

Agyei, W. (2015). Project Planning And Scheduling Using PERT And CPM Techniques With Linear Programming . International Journal Of Scientific & Technology Research Volume 4, Issue 08

Boyle, G. (2004) Renewable Energy Power for a Sustainable Future. 2nd Edition, Oxford University Press, Oxford [online] Available at: References-Scientific Research Publishing (scirp.org) [Accessed 20 Feb. 2021]

Dereje, D. (2013). Ethiopia's Renewable Energy Power Potential and Development Opportunities. Addis Ababa: Ministry of Water and Energy.

Ethiopian Electric Power, (2007). Genale Dawa Hydropower Project Feasibility Study. Addis Ababa: EEP

IEA, (2013). Key world energy statistics: France, [Online] Available at: http://www.iea.org/publications/freepublications/publication/KeyWorld2013.pdf [Accessed 1 Mar. 2021]

IFC, (2015). Hydroelectric Power: A Guide for Developers and Investors. Washington, DC [Online] Available at: (worldbank.org) [Accessed 1 Mar. 2021]

Kerzner, H. (2017). Project Management: A Systems Approach to Planning, Scheduling, and Controlling. 12th Edition, Hoboken, New Jersey: John Wiley & Sons.

Kobusingye, B., Kyalo, M. J., & Mulyungi, P. (2017). Influence Of Stakeholders Involvement On Project Outcomes. A Case Of Water, Sanitation, And Hygiene (Wash) Project In Rwanda, European Journal of Business and Social Sciences, Vol. 6, No.06, ISSN: 2235-767X.

Lumbroso, D., Hurford, A., Winpenny, J. and Wade, S.(2014). Harnessing Hydropower: Literature Review [online] Available at: (researchgate.net) [Accessed 20 Jan. 2021]

Mahianjo, J., & Njeru, A. (2016). Factors influencing project implementation in the department of public health in Kiambu County. The Strategic Journal of Business & Change Managment, 12-23.

Mallon, K. (2006). Renewable Energy Policy and Politics: A Handbook for Decision Making [online] Available at: (researchgate.net) [Accessed 20 Jan. 2021]

Ministry of Water and Energy, (2012). Scaling - Up Renewable Energy Program Ethiopia Investment Plan. Addis Ababa: Ministry of Water and Energy.

PMI, (2017). A guide to the project management body of knowledge (PMBOK® guide). Fifth edition: Pennsylvania, USA

Renewable Energy Policy Network for 21st century, (2014). Renewables 2014 Global Status Report [Online] Available at: http://www.ren21.net/REN21Activities/GlobalStatusReport.aspx [accessed 14th Jan. 2021].

Sambu, C., Ogolla, P. and Kitheka, S. (2019). Factors influencing project implementation in Kenya Pipeline Company Limited, Kenya. The Strategic Journal of Business & Change Management, pp. 486 – 502.

Tewelde, B. (2012). Scaling Up Renewable Energy Program: Ethiopia Investment Plan. Addis Ababa: Ministry of Water and Energy.

United States Bureau of Reclamation, (2005). Hydroelectric power, USAAvailable at: http://www.usbr.gov/power/edu/pamphlet.pdf

World Bank, (2009). Directions in Hydropower. Washington, D.C: [Online] Available at: http://siteresources.worldbank.org/INTWAT/Resources/Directions_in_Hydropower_FINAL.pdf [accessed 28th Jan. 2021].

Appendix 1

Questionnaire& Interview Instruments Used to Collect Information

Addis Ababa University

School of Commerce

Project Management Postgraduate Program

Survey Questionnaire

Dear Sir/Madam;

I am undertaking a research on the topic entitled "Factors Affecting Implementation of Genale Dawa Hydropower Project" as a partial fulfillment of senior essay required for Masters of Arts program in project management at Addis Ababa University School of Commerce.

The main purpose of this questionnaire is to collect information regarding Factors Affecting Implementation of Genale Dawa Hydropower Project in Ethiopian Electric Power. As an Ethiopian Electric Power staff and working in Genale Dawa hydropower project you are invited to participate in this survey.

I would like to confirm you that your response will be kept strictly confidential and it will be used exclusively for the purpose of this research. Besides, your swift response is enormously important in order to finalize the research timely and I would appreciate if you complete and return it within a short period of time of your responses.

Your cooperation is highly appreciated in advance, and looking forward to receiving your response.

Yours faithfully,

Fikre Hailu

Tel: +251913622207

Email: fikre.hailu1999@gmail.com

Thank you very much!!!

PART I: Background Information of Respondents

Please fill the answer by putting "√" mark.

No	***Items***	***Option/Dimension***	***Put (√)***
1	Gender	Male	
		Female	
2	Age	20 - 30 Years	
		31 - 40 Years	
		41 - 50 Years	
		Above 50 Years	
3	Marital Status	Single	
		Married	
		Separate	
		Divorced	
		Widowed	
4	Educational Qualification	PhD	
		Masters	
		First Degree	
		Diploma	
5	Work Experience	Below 5 Years	
		6 -10 Years	
		11-15 Years	
		Above 15 Years	

PART II:

Please indicate your response by using tick mark (√) according to your choice.

No	Descriptions	Scales				
		Strongly Disagree	*Disagree*	*Neutral*	*Agree*	*Strongly Agree*
1	***Stakeholder Engagement***					
1.1	Project stakeholders were identified regularly and their interests, involvement, interdependencies, influence, and potential impact on the project success has been analyzed					
1.2	Project stakeholders have been communicated to meet their needs and expectations, address issues, and foster appropriate involvement					
1.3	Approaches to involve project stakeholders based on their needs, expectation, interests, and potential impact on the project has been developed					
2	***Monitoring and Evaluation Systems***					
2.1	Monitoring and evaluation reports have been used for decision making					
2.2	There were good practice of developing monitoring and evaluation schedule					
2.3	Standard template have been used for monitoring and evaluation during Genale Dawa hydropower project implementation					
3	***Top Management Support***					
3.1	Top management of the EEP was able to make effective leadership and decision making					
3.2	There was guidance from Top Management for successful completion of Genale Dawa project implementation					
3.3	Top management of the EEP had willing to provide the necessary resources and authority power for the successful					

	implementation of Genale Dawa project					
4	***Team Building***					
4.1	There was trust and values within the Genale Dawa hydropower project implementation team					
4.2	The team members were willing to carry out their roles and responsibilities effectively					
4.3	Genale Dawa hydropower project team understands the goals and objectives of the project implementation					
5	***Communication Systems***					
5.1	Performance feedback has been regularly provided to all stakeholders based on their role and responsibility					
5.2	There was clear, timely, and unambiguous communication between all parties during the project implementation					
5.3	Standardized formats and templates has been used for all formal project communications regarding with the interest of the stakeholders					
6	**Genale Dawa hydropower project has completed on time, within budget, meets quality target and contributes to the achievement of the Ethiopia Electric Power's strategic objectives**					

Appendix 2

List of interview questions for Project Manager, Contractor's Site Manager, Civil Works Head, Geotechnical Head and Electromechanical Head of Genale Dawa hydropower implementation project

Dear Respondent,

The objective of this interview is to gather and analyze relevant and in-depth information that will provide insights about Factors Affecting Implementation of Genale Dawa hydropower project in Ethiopian Electric Power. This study is undertaken as a partial requirement for the completion of MA in Project Management. The lists of questions, conducted through telephone, are as follows:

1. Do you think there was effective top management support, commitment and guidance during Genale Dawa hydropower project implementation process?

2. Was there monitoring and evaluation system during the implementation of Genale Dawa hydropower project?

3. Was there effective communication system during the implementation of Genale Dawa hydropower project?

4. Ware there competent project team members during the implementation of Genale Dawa hydropower project?

5. Do you agree that Genale Dawa hydropower project is successfully implemented?