

**DETERMINATES OF PROJECT COMPLETION IN TIME
A CASE OF DEDO AND KERSA WOREDA WATER PROJECT
FOUND IN JIMMA ZONE**

**A Thesis Submitted to the School of Graduates of Jimma University in
PartialFulfillment of the Requirements for the Master of Arts Degree in
Project Management and Finance**

By

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**JIMMA UNIVERSITY
COLLEGE OF BUSINESS AND ECONOMICS
DEPARTMENT OF ACCOUNTING AND FINANCE
MPMF PROGRAME**

JULY, 2020

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Declaration

I hereby declare that the this thesis entitled “ **Determinates of Project Completion in Time A Case of Dedo and Kersa Woreda Water Project Found In Jimma Zone** ” was composed by myself, with the guidance of my advisor, that the work contained herein is my own except where explicitly stated otherwise in the text. And that this work has not been submitted, in whole or in part, for any other degree or processional qualification. Parts of this work have been published in (state previous publications).

Name: WassihunAbebeEjigu Signature..... Date:

Certificate

This is to Certify that the thesis prepared by **Student WassihunAbebe** entitled “**Determinates of Project Completion in Time A Case of Dedo and Kersa Woreda Water Project Found In Jimma Zone** ” and submitted in fulfillment of the requirements for the degree of Master of Project Management and Finance in complies with the regulations of the University and meets the accepted standards with respect to originality and quality.

Signed by the Examining Board:

Ex. Examiner: SignatureDate:

Int. Examiner: Signature......Date:

Thesis Advisor: Arega Seyoum (PhD) Signature.....Date:

Thesis Co-Advisor: Ins.Mohammed Getahun Signature..... Date:,,

Abstract

This study sought to investigate on factors affecting the completion of water projects in time from contractor, client and consultants' perspectives during the construction phase. The study was a case of water projects implemented by OWSS in Kersa and Dedo woredas and examined how and to what extent financing, monitoring, contractor's capacity and contract variations as important parameters in a project's construction phase influence the completion time of water projects in Dedo and Kersa woreda. The study was explanatory survey in nature. Self-administered questionnaires and interviews were used to collect primary data while content analysis of relevant project implementation. Questionnaires were administered to persons purposively drawn from contractors, consultants and clients (OWSS personnel), involved in the implementation of the nine projects in the study. Explanatory statistics, correlation and regression analysis through Statistical Package for Social Science (SPSS) version 20 was used to analyze data and present the findings of the study. Strata and Census survey sampling were used. Multiple regression analysis of the variables at 1% level of significance and 99% level of confidence showed that, financing had a 0.003 level of significance; monitoring 0.002, contractor's capacity 0.001 level of significance while contract variations had a 0.004 level of significance implying that the most significant factor is contractor's capacity followed by monitoring of projects. The data findings also showed that financing effectiveness will lead to a 0.534 increase in timely completion of projects; monitoring effectiveness will lead to a 0.323 increase in timely completion of the projects; contractor's capacity will lead to a 0.356 increase in timely completion of the projects; and contract variations will lead to a 0.237 decrease in timely completion of the projects. This means that the most significant factor is contractor's capacity followed by monitoring. The most independent variables which affect project completion in time were financing, monitoring, contract variations and contractor's capacity. The level of financing of a project's construction activities and its timeliness was found to be a determinant of its completion time, and that effective monitoring partially depends on adequacy of supervisory personnel as well as timeliness in decision making and taking of actions to alleviate significant project target deviations that exist. Contractor's incompetence that can be attributed to inadequate equipment and personnel with required skills as well as financial

difficulties among others is a key factor contributing to time overruns in the water projects, while contract variations are common among the water projects and they impact negatively on the projects' completion time. To improve on the completion time of water projects in WSSs, It is important that WSSREB emphasizes on a comprehensive feasibility based investment and financing plan from all WSSs as a prerequisite for funding of proposed projects in order to ensure adequacy of projects' budgets and timely payments of contractors certificates. All WSBs should adopt a comprehensive result based monitoring system with which every implementing agent should comply so as to enhance effectiveness in monitoring of ongoing projects. WSBs should also ensure that the contractors they procure will have successfully executed similar projects in the past as an assurance of adequacy of the contractor's capacity in construction management. To mitigate on the negative impact of contract variations, WSSREB and WSSO should ensure that adequate forecasting mechanisms are included in the implementation plans to enable identification of potential threats early enough. It is expected that the study findings are useful to the government and Water Supply Service in formulating strategies aimed at improving completion time of water projects and other public infrastructure project implementers

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Acronyms

OWSS:	Oromia Water Supply Service
NWSS:	National Water Supply Service.
MWI:	Ministry of Water and Irrigation.
WSI:	Water Supply Investment.
PPI:	Project Performance Indicator.
WSB:	Water Supply Board.
MDGs:	Millennium Development Goals
JU:	Jimma University
MWRS:	Ministry of water and Resource supply

CHAPTER ONE

INTRODUCTION

1.1. Background of the Study

Access to clean water and sanitation is declared as a human right by United Nations in 2010 (UN, 2013). At the beginning of 2000, 1.1 billion people of the world's population were without access to improved water supply. The absence of reliable water supply and sanitation services and inadequacies in these services has been the main cause of death of millions. Government and non-government organizations are carry out several water supply construction projects across the country to reduce such a big problem. However, several studies pointed of that most of construction projects suffer delays. The effects of these delays may be of considerable magnitude on the efficiency of the project. It is possible to reduce these delays through recognition of their real causes (Ashraf and Ghanim, 2016).). In Ethiopia, only 8.25% projects have been finished to the original targeted completion date. The remaining 91.75% delayed 352% of its contractual time (Worku and Jah, 2016). The construction industry, in particular, water projects, plays a significant role in socio-economic development as it provides the basic services such as water supply and sanitation which are necessary for the wellbeing of the society. A project is considered successful if it is delivered on time, within budget and acceptable quality (Mbamali, 2005). Unfortunately, most projects are never completed on time (Sambasivan and Soon 2007). This has limitations in that there is no certainty in factors causing delays in project activities (Jeffrey et al., 1997). As a result, the identification of factors influencing the completion time of public sector project becomes essential. Over 1.2 billion people worldwide lack access to safe drinking water (World Bank, 2010). In this regard, providing access to clean, affordable and accessible water is therefore a top global priority, The African continent faces the most difficult challenge for achieving the water and sanitation MDG targets. Ethiopia like other countries in Sub-Saharan Africa has its socio-economic development goals highly dependent on the availability of clean water (Water and Sanitation News, 2007). Like other African countries, Ethiopia is water-scarce with its renewable water per capita. The government has however taken up the challenges of Water Declaration by envisioning availability of water and access to all by the year 2030 (Ethiopia Vision 2030). To enable achieve this long term goal, the government has identified a number of flagship water projects and

initiatives to be undertaken in the water sector in order to increase the national water coverage.

On access to safe water, for example, the total urban population with access to safe water in 2011/12 was 15% which was below the target of 54% envisaged in the vision 2030 goal for 2012. In addition, only 25% of the rural population had access to safe water which fell below the target of 72% as per the vision 2030 flagship project's goal for 2012 (MWRS, Annual Water Sector Review Report 2012). The report cited factors that affect the completion of these water projects are unexperienced project managers, inadequate monitoring of ongoing projects, inefficient resource utilization, and delayed disbursement of project development funds as some of the key challenges hampering progressive improvement in water project supply coverage. Since construction of new water supply infrastructure as well as rehabilitation and expansion of already existing ones is among the efforts the government is making towards extending access to safe water; there is need for the government's water infrastructure implementing agencies to understand the factors influencing the completion time of their water supply projects in order to ensure that the projects are completed within the specified time frames. Development of water supply infrastructure in Jimma Zone is the mandate of Water Services office in federal and regional levels. In the year 2010/11 overall access to safe water in the rural area reduced to 25% from 37.6% reported in the previous year while access in rural settings decreased to 15% from 27% reported in the previous year. In Jimma zone, 42% of the water projects implemented were successfully completed and 58% of water projects were not completed on time. This indicates that various water projects face enormous challenges of implementation. Although studies have been done on the factors that affect the completion of water project / construction projects in Jimma zone, it is necessary to undertake studies in projects in rural and sub-urban areas. Therefore, the focus of this study is limited to those factors that affect the completion or implementation time of water projects in selected woredas of Jimma zone. The construction phase is when the work activities of the project plan are executed, resulting in the completion of project deliverables and achievement of the project objective(s). The contractor's capacity for effective construction management is paramount during the implementation stage if the project's stipulated targets are to be achieved. During this stage, money is spent to finance the activities and time is expended. At the same time, monitoring and control should continuously be carried out to ensure that the project remains on course (Kezner 2002).

1.2 Statement of the problem

Delays in completion of infrastructure development projects during implementation continue to pose great challenges to developing countries (Sambasivan & Soon, 2007). The Ethiopian Government has invested heavily and continues to invest in infrastructure projects. Despite the importance of infrastructure and the huge financial resources committed to it, the intended benefits are partly or never realized due to many unsuccessful or delayed project completions (Mwandali 1996, Talukhaba 1988, and Musa 1999). Consequently, this has a negative effect because delayed completion of projects results to; cost overruns, disputes, litigation and sometimes complete abandonment of important projects. Secondly, project beneficiaries are deprived of the benefits that would have otherwise accrued from timely completion of the projects. Delays in completion of water projects in Jimma Zone are a common phenomenon.

According to Jimma water service office the year 2015 achievement report Jimma Zone Dado and Kersa completed late while 10 of 14 (71.43%) ongoing projects were behind schedule. According to Dado and Kersa woredas, for example; 9 of 16 (56.25%) completed projects in the rural area were Oromia Water Supply Service, (OWSS) Annual Water Sector Review Report 2015; poor site management and supervision of projects, lack of elaborate monitoring system to inform on the status of ongoing projects, financing challenges and contract variations are key contributory factors to this phenomenon. While overall national water supply coverage despite this phenomenon has steadily increased over the recent years reaching a level of 60% and 35% in urban and rural areas respectively (NWSS, Annual Water Sector Review Report 2012), a gap of 20% and 30% respectively needs to be closed to reach the sector's National Water Services Supply Strategy target coverage of 85% in urban areas and 70% in rural areas by 2020 (NWSS, 2004). In Jimma water project construction are under taking by Non-governmental organizations and by government specially in different woredas in Jimma, but some of the project are not completed on time and some of the project are completed but they have no provided service yet. There is Lack of access to clear water in Jimma zone especially, in those two woreda.

Efforts to increase access to safe and adequate water in Jimma Zone that are in woredas and the country as a whole can be reinforced through professional implementation and monitoring of planned water supply projects in the woreda in order to ensure that they are completed within the specified time. It is in this context that the researcher intended to identify the factors that are

significant in influencing the completion time of water projects in Jimma Zone with particular focus on projects in two Jimma woredas in Dedo and Kersa factors involved in the construction phase of the projects namely; financing, monitoring, contractor's capacity and contract variations are the focus of this study. There are very few studies in Jimma zone which focus on water project completion time and quality as a measure of project success.

In Jimma zone, 42% of the water projects implemented were successfully completed. This indicates that various water projects face enormous challenges of implementation. Although studies have been done on the factors influencing completion of water construction projects in Jimma zone, it is necessary to undertake studies in projects in rural and sub-urban areas. Also with the implementation of a devolved system of government where the Counties are responsible for some water projects, it would be interesting to investigate the factors that would inhibit successful completion of these projects. It would also fill the gap in the research on factors influencing completion of water projects undertaken by Jimma zone in Dedo and Kersa woreda which will encompass the influence of finance, contractor's capacity, Monitoring, and contract variations. This would help draw conclusions on factors that influence water projects in Dedo and Kersa woreda.

Research Questions

1. Does project financing significantly affect project completion in time in Dedo and Kersa woreda water project?
2. Does project monitoring process significantly affect project completion in time in Dedo and Kersa Woreda water projects?
3. Does project contractor's capacity significantly affect project Completion in time in Dedo and Kersa Woreda water projects?
4. Does project contract variations significantly affect project completion in time in Dedo and Kersa Woreda water projects?

1.3 Objective of the Study

1.3.1 General Objective

The general objective of this study was to identify the factors that affect the completion of water projects in time in Jimma Zone with particular focus on projects in Dedo and Kersa woreda.

1.3.2 Specific Objectives

In addition to the broad objective stated above, the study assumes the following specific objectives:

- i) To assess the effects of project financing on water projects completion in time water projects in Jimma zone Dedo and Kersa Woreda.
- ii) To assess the effects of project monitoring process on water project completion in time water projects in Jimma zone Dedo and Kersa Woreda.
- iii) To examine the effects of project contractor's capacity on water project completion in time water projects in Jimma zone Dedo and Kersa Woreda.

To evaluate the effects of project contract variations water project completion in time in Jimma zone Dedo and Kersa Woreda

1.5 Significance of the Study

The findings of this study may be useful to the following: The study may provide useful insights to the government and the development partners on the factors that impede on the timely completion of projects and therefore help in formulating strategies to address these factors. To the regulator water service the study will provide useful information on the key factors influencing the completion time of water projects and thus help in formulating better strategies and regulatory tools to enhance efficiency and effectiveness in the implementation of water projects. Project contractors and clients may find the findings of this study a useful source of information on what factors they need to closely focus on in order to ensure delivery of projects within the stipulate time, or future researchers and academicians the findings of this study may provide useful material for other related researches as well as providing reference material on

what factors need to be considered for successful implementation of water projects in Jimma Zone Dedo and Kersa woredas.

Late completion of projects is characteristics of some of water projects in the study area.

The area is also easily accessible to the researcher which enabled faster collection of data and hence timely completion of the research project.

1.6 Scope of the Study

The study was limited to identify the factors that affect the completion time of water projects. The study were limited to Jimma Zone with particular focus on water projects in Dedo and Kersa woreda. The sampling frame was desired from various subgroups of population in the project from the two woredas in the town. The information from the project engineer's represented the client, site agents/engineers the contractor and resident engineers the consultant will be obtained through administration of survey questionnaires and responses recorded and analyzed for presentation. To obtain the sample population of respondents' stratified and purposive sampling were adopted.

1.7 Organization of the Study

Chapter One which is the introduction to the study covers the following sections; Background to the study, Statement of the problem, purpose of the study, research objectives and the corresponding research questions, Significance of the study, Scope and delimitations of the study, assumptions of the study and definitions of significant terms. Chapter two titled literature review will explore what has been done in relation to the study by examining the existing literature on factors that influence the completion time of construction projects in the world and particularly in Kenya. It will lay emphasis on four variables; financing monitoring, contractor's capacity and contract variations. The chapter will consist of the following sections; an introduction, project completion time, financing, monitoring, contractor's capacity, and contract variations, theoretical framework, conceptual framework, summary of literature and research gap Chapter three will deal with the research design and methodology and will comprise of an introduction, research design, target population, sampling procedure, data collection method, validity and reliability of the research instruments, methods of data analysis, ethical Consideration sand operational definitions of the study variables. Chapter four presents findings

of the study discussed under thematic areas and subsections in line with the study objectives while chapter five covers summary of findings, discussions, conclusions, recommendations and suggestions for further study.

CHAPTER TWO

2. LITERATURE REVIEW

2.1 Introduction

This chapter reviews existing literature relating to the research problem outlined in the previous chapter with particular focus on the main variables in the study which if addressed would lead to completion of water projects as scheduled. The parameters to be investigated will be financing, monitoring process, contractor's capacity and contract variations. The chapter has the following sections; conceptual framework/empirical review and conceptual framework that critique of the existing literature relevant to the study, research gaps and summary. The theoretical framework will be based on Henri Fayal's administrative theory of management. The theory mainly focuses on the personal duties of management. Empirical review is based on Several studies have been carried out on factors affecting completion time of water projects in African countries and around the world and the conceptual framework illustrating the relationship between different variables in the study are also outlined.

2.2 Project Completion Time

By its basic definition, a project comprises a defined time frame to completion, a limited budget, and a specified set of performance characteristics (Kerzner, 2002). Construction contract time of a project is defined as the time allocated to complete the actual project construction starting from the time of tender award to the time of delivery of the project in the state described in the contract (Rendon&Garrett, 2005).The project time frame as a variable is

fixed by consideration of time required to procure various materials and equipment used in the project, labor deployment and capability, Finance flow, Predictable weather and managerial ability to drive the project(Porters , 1999).

A project is said to be complete when its deliverables and objective(s) are achieved. This is realized through execution of the project's work activities which occurs during a project 'implementation construction stage. Project construction then requires that materials and

resources necessary for the work activities are procured, the project is produced, and its performance capabilities verified (Kerzner and, 2002). The project's execution phase therefore demands that all project management disciplines be brought together for a product or service that meets the project deliverable requirements and the customer's need(s) is produced (Giridhar and Ramesh, 1998). Project management involves managing the resources: workers, machines, money, materials and methods used (Giridhar and Ramesh, 1998). Management requires that resources be planned for and procured, coordinated/organized for efficient use, activities carried out by people who require to be directed through communication of what needs to be done and motivated towards attainment of objectives. Control through continuous result based monitoring and reporting should always be the basis of communication in management.

Further Frimpong et al. (2003) revealed that project management tools and techniques play an important role in the efficient and effective completion of a project. Activity schedules and monitoring frameworks are typical management tools. While some projects are effectively and efficiently managed others are mismanaged leading to failure to meet their set deadlines for completion (Jagboro and Aibinu, 2002).

Though completing projects on time is an indicator of efficiency in project management, project successes are not common in the construction industry especially in developing countries and Kenya is no exception (Assaf, 2006). This has motivated Professionals and scholars to take steps to meet this challenge by trying to identify delay factors and the best ways to mitigate them. Chan and Kumara Swamy (2002) remarked that studies in various countries appear to have contributed significantly to the body of knowledge relating to time performance in construction projects over the past three decades and that construction time is becoming increasingly important because it often serves as a crucial benchmark for assessing the success of a project and the efficiency of the project organization.

Studies conducted in developed economies like UK/USA/Australia (Ireland, 1997), China (Kumar Swamy and Chan, 1997; 1998), Florida (Ahmed et al. 2002), revealed a trail of time overruns on building and infrastructure projects in public and private sectors, attributable to numerous factors that come into play during the projects' implementation. Similar observations have been made in developing countries, such as Ghana (Frimpong et al, 2003); Nigeria (Jagboro and Aibinu, 2002); Saudi Arabia (Assaf, and Al-Hejji, 2006), Vietnam (Long et. al. 2007), and

Singapore (Lingetal,2004) revealing factors ranging from inflation, project complexity, inaccurate material estimation, financing, change orders, design changes, late submission of drawing, poor specification, incorrect site information, poor contract management among many others as major sources of overruns. Specific research undertaken to investigate what ails implementation of projects in some public sector projects in Kenya, provide an insight to what has been the major causes of projects time overruns, failure to meet specifications and stakeholders expectations. Musa (1999) conducted a study on factors influencing delays in water projects in Kenya funded by the Government. A similar study by Karimi (1998) focused on factors contributing to cost overruns in projects under the Ministry of Water. Talukhaba (1988) investigated on time and cost performance of construction projects. Mwandali (1996) did an analysis of major factors that affect project management in Kenya Railway projects. Their findings showed that, poor communication, inexperienced project managers, contract variations and inadequate resources as being some of the major contributors to poor time performance of public sector projects. .

As a result, many major projects fail to meet scheduled deadlines. In a construction project, in which time truly equals money, the management of time is critical (Duran, 2006). Predicting a likelihood of schedule delay thus plays a key role in overall project success (Luu et al., 2009).

Any construction project comprises of two distinct phases: the preconstruction phase (the period between the initial conceptions of the project to awarding of the contract) and the construction Phase (period from awarding the contract to when the actual construction is completed) (Sambasivan and Soon, 2007). There are many underlying factors that influence the timely completion of projects in both phases. However, the factors that have major impact on project completion time occur in the construction phase (Frimpong et al., 2003) and is of primary concern to contractors, owners and consultants—the parties involved in the implementation of projects(Koushki&Kartam, 2004). The main role of the construction project manager is thus to simultaneously manage the four basic elements of a project: resources, time, money, and most importantly, scope to avoid delayed completion of the project as well as ensure overall project success (Porters & Michael, 1985).

According to Zimconsult study on Economic and Financing of the water sector in Kenya (20011), water is essential for life and is the basis for economic development. In this regard, one

objective in the NWSS is to increase the rural water supply from the current access rate of 45% to 75% by the year 2015 in line with the Millennium Development Goals (MDGs) access target of 50% to all by 2015. This is based on increasing the available water from 60 liters per person per day to 80 liters per person per day for individual house connection and increasing the available water at standpipes from 15 litres per person per day to 20 liters per person per day while decreasing maximum distance to nearest public standpipe to 2000 meters (NWSS 2007-2015). However, at an average annual increase in access of 6.4% points (WASREBIMPACT Report, 2012), attaining the 75% the NWSS target will not be feasible as this requires closing a gap of 30% points in just three years. Moreover, the demand for water for various uses has continued to increase rapidly outstripping supply and resulting in unreliable water availability and conflicts. This poses a threat to Kenya's development blueprint-Vision 2030 goal of ensuring adequate water and sanitation as a primary driver of other economic sectors. Efforts by WSBs (the government's water infrastructure implementing agencies) to contribute towards this goal by increasing access to safe water and sanitation services in their areas of jurisdiction through infrastructure development remain a big challenge which calls for a concerted effort to address (WASREBI impact Report, 2009). Professional planning, implementation and monitoring of water projects would accelerate the achievement of this goal by ensuring that the projects are completed within the allocated time, cost, quality and scope. While WSBS have been able to implement several investment projects under the umbrella of vision 2030 their investment realization level is still below par (Wasreb Impact Report, 2009).

The objective of this study was therefore to identify the factors influencing the completion time of water projects.

2.2.1 Financing and Project Completion time

Financing provides the monetary resources required to meet the project construction budget as represented by the project's bill of quantities. When the funds allowed for the project are short the contract time is extended, or scope decreased, or both. It is then imperative that investment and financing plans based on feasibility studies are made to enable adequate funding. Devarpiya & Ganesan 2002 obtains that poor financing arrangements, inadequate construction funding and budgets, bad cash flow that may be occasioned by contractor's and client's financial difficulties, and inaccessibility to formal structured finance have a heavy bearing on the project smooth

running leading to delayed completion of a project. Thomas (2002) also identified financing as a major success criterion of construction projects. At present capital investment in water is almost entirely financed from public funds. WSB success funds to execute infrastructure investment projects from the treasury in form of loans and grants. Though the public sector is charged with the responsibility of providing public services, the numerous competing demands from the different sectors of the economy make it difficult for available fiscal resources to match investments required in water services infrastructure (Wasreb Urban Water Financing Report, 2011). Further, the constitution recognizes the human right to water and sanitation which impacts the development, organization and management of water services provision in the country. This has made partnership with the private sector critical in plugging the finance gap for infrastructure development. The Kenya Water sector should then continue making efforts to attract financial support from development partners and develop its commercial financing potential. This can only be achieved on the basis of sound management practices and adequate financial planning.

According to Waser bi Impact Report (2012), the biggest weakness of WSBs is the absence of investment plans sufficiently detailed (to prefeasibility quality), for further development through feasibility studies and financing plans. The consequence has been low value for money and unacceptably low investment realization. There is therefore urgent need to have a comprehensive sector investment plan indicating the investment necessary to achieve the progressive realization of the right to water and sanitation that is based on prioritized demands. This investment planning would guide investments in the water service sector and would be easy to sell to development partners. The researcher therefore intended to determine the influence of financing on the completion time of water projects.

2.2.2 Monitoring and Project Completion time

Monitoring and reporting is a component of project control and salsa management function in any project carried out through the duration of every phase of the project. It entails systematic collection of data on specified indicators to provide management and other stakeholders of an ongoing intervention with indications of the extent of progress and achievement of objectives and progress in the use of all allocated resources (Kerzner, 2002);Navon (2005) obtained that a control system is an important element to identify factors affecting construction project effort and that one or more Project Performance Indicators (PPI) is needed for each of the project goals

to help guide the control process. Effective project monitoring helps the project manager ensure that the project is on track to completion by certain deadlines by comparing actual performance with planned performance and taking timely corrective action to yield desired outcomes when significant deviations exist. Making allowances for adequate monitoring and feedback mechanisms therefore gives the project manager the ability to anticipate problems, to oversee corrective measures, and to ensure that no deficiencies are overlooked. Monitoring therefore informs forecasting and planning during the implementation phase of a project. The plans are then communicated to the workers for execution (Navon, 2005). The WSBs' monitoring of investment implementation continues to be inadequate. A telling example in this respect is the futile effort by the Ministry of Water and Irrigation (MWI) to streamline WSBs' investment planning and monitoring through the Water Services Investment Tool (WASBIT). The WASBIT was specially designed to help WSBs to direct investments towards progressively increasing water and sanitation coverage. Further, lack of a comprehensive monitoring framework to inform on changes pertaining to service delivery and status of ongoing projects adversely affects the attainment of Vision 2030 and NWSS targets. It also affects the planning and targeting of resources and misinforms on coverage (MWI, Annual Water Sector Review Report 2012). The researcher therefore intended to establish the influence of the monitoring process on the completion time of water projects.

2.2.3 Contactor's Capacity and Project Completion time

Projects are fulfilled through the efforts and skills of people, with the help of systems. The contractor's capacity for effective construction management is paramount during the construction stage if the project's stipulated targets are to be achieved. Construction management manages the overall planning, coordination and control of project activities from the beginning to the completion (Barbara J., 2010). The contractor should have capacity to carry out construction management functions which typically include: (1) Specifying project objectives and plans including delineation of scope, budgeting, scheduling, setting performance indicators and selecting project participants. (2) Maximizing the resource efficiency through procurement of labor, materials and equipment. (3) Implementing various operations through proper coordination and control of planning, design, material estimation and subcontracting in the entire construction process. (4) Developing effective communication and mechanism for resolving

conflict an aspect of directing and motivating people towards attainment of project objectives (Chris Hericksson (2008)). Xiao and Proverbs (2003) and Sambas Ivan and Soon (2007) conclude that contractor's construction management capacity ranks among the ten most common factors influencing successful completion of projects. As such; Contractor's incompetence inadequacy attributed to problems such as lack of contractor experience, poor methods of construction and delayed procurement of equipment and materials, contractor's cash flow problems, labor shortages or engaging inadequate labor skills and unrealistic budget fronted by the client is a key factor contributing to time overruns in construction projects globally (Chan and Kumaraswamy, 2002). It is in this background that the researcher intended to examine how the contractor's capacity influences the completion time of water projects.

2.2.4 Contract Variations and Project Completion time

Construction projects are one-off endeavors with many unique features, such as long times pans, complicated processes, extremely challenging environments, financial strain and dynamic organization structures (Zhou, Zhang and Wang, 2007). As such; problem areas exist in almost every implementation regardless of how carefully the project was initially planned due to the fact that it is impossible to foresee every trouble area or problem that could possibly arise. Similar observations were made by Chan and KumaraSwamy (1998), who found that unexpected problems arise during the construction phase leading to contract variations and that poor site management, unforeseen ground conditions and low speed of decision making involving all Project teams were the three most significant factors causing delays in completion of building works. Such factors will conspire against the project and may impact negatively on the project targets of time, cost, quality and scope (Fugar and Agyakwah-Baah, 2010). As a result, it is important that the project manager makes adequate initial arrangements for forecasting mechanisms to be included in the implementation plan to enable identification of any potential threats early enough so that appropriate action is taken to minimize their impact on the project (Soon, 2010). The researcher therefore intended to establish the extent to which contract attritions influence the completion time of water projects.

2.3 Theoretical Framework

This study will be based on Henri Fayal's administrative theory of management. The theory mainly focuses on the personal duties of management. In today's construction industry, it is vital to have concrete management plans so that projects are completed on time. Henri Fayal's management theory is said to be the most relevant in relation to the construction industry (Jarvis 2004). The theory purports that management is a practical skill that falls into patterns that can be identified and analyzed. The theory also suggests that management is not a personal talent but is a skill that can be taught and learnt. According to Fayol; management is the coordination of all resources through the process of planning, organizing, directing and controlling in order to attain a given stated objective. Fayolism is therefore concerned with how an organization should be managed in order to make the best use of its resources to achieve its goals and is based on five management principle roles. The five principles and how they relate to project management are: to forecast and plan, to organize, to direct, to coordinate, and to control. Forecasting and planning was the act of anticipating the future and acting accordingly. Organizing was the act of availing the resources both human and non-human required for planned organization activities. Directing was maintaining momentum and activity among workers. Coordination was the alignment and harmonization of the group's efforts. Finally, to control meant seeing to it that everything happened in accordance with established rules and expressed comm. And .Fayol developed fourteen principles of administration to go along with management's five primary roles. These principles are: specialization/division of labor, authority with responsibility, discipline, unity of command, unity of direction, subordination of individual interest to the general interest, remuneration of staff, centralization, scalar chain/line of authority, order, equity, stability of tenure, initiative, and esprit de corps (team work). Fayol clearly believed personal effort and team dynamics were part of an "ideal" organization (Fayol, 1916).

2.4 Empirical Reviews

As the water project construction industry continues to grow in size and complexity, there exists planning and budgeting problems. As many researchers' findings showed that it is common for projects not to be completed on a given time and within the prescribed budget. This mostly happed due to the presence of various interest groups on the project activities. These interest

groups include project owners or clients, contractors, consultants, financiers, suppliers, end users, government and the like. These parties are the owner (clients) , contractors and consultants. Other delays, which do not arise from these three parties, are based on external causes.

These causes are material suppliers, government, financiers, monitoring, consultant and contracture. Many researchers have categorized the reasons for project delays are internal and external factors caused by different stakeholders.

Studying the significant factors that cause delay of water project construction in Malaysia, Salim&Ernawati (2007: Pp.199-200), used four categories for analysis, namely contractor, consultant, owner and monitoring and finance. As far as causes related to contractor actions are concerned, financial problems, shortage of materials and poor site management has ranked among the top three. Owner causes included delayed payments, slow decision –making and contract scope changes. The top three consultant causes were poor supervision, slowness to give instructions and lack of experience. Finally, those causes of delay included shortage of materials, poor site conditions and lack of equipment and tools in the market. Similarly, Sambasivan& Soon (2007), divided their findings into client, contractor and consultant categories, with all three categories listing poor site management, in adequate contractor experience and poor subcontractors are among the top causes for time delays on construction projects. Ogunlana et al. (1996), investigated 12 high–rise buildings and differentiated their findings into client, consultant, contractor related and external causes for time delays. The weighted findings among these three categories indicated that material shortages, overstretching of technical personnel and design changes were the most important causes for project delays. Ahmed et al. (2003) and Theodore (2009)identified the following factors causing delays in construction projects. One of the most important problems that may arise in construction project is delays and the magnitude of these delays varies considerably from project to project. According to delay categories that were contractor related, client related, consultant related, labor related and external related.

According to Odeyinka HA Yusif A(1997), the main client related causes of delay in Nigerian construction projects are variation orders, slow decisions, and problems in cash flow. The main contractor related causes of delay in Nigerian construction projects are difficulties in finances, poor site inspection, and shortage of labor, problems in planning and scheduling, and problems in material management & also the main causes of delay in Nigerian construction projects are natural disasters, weather conditions, conflicts, and labor disputes and strikes. According to

AssafSa, Alkhalil M & Al-Hazmi M. (1995), main causes of delay according to clients are slow progress of contractors, labor shortage and poor skills, and errors in design. The main causes of delay according to contractors are design modifications and changes, payments clients, and approval of payments. The main causes of delay according to consultants and engineers are slow decisions of client, subcontractor issues, and cash flow during construction and payments by clients, and approval and preparation of design and drawings. It is common to see construction projects failing to accomplish within the specified project period. Hardly few projects are complete on time and within budget. Completing the project or reaching to the end of any project is not a kind of success for the project owner. For the client or owner of the project, success of the project depends on many factors; the most important factors are finishing the project within the budgeted cost and reaching to the closing date of project without project time delay with a good quality of work and creating no health and safety problems, Abdulmajid & McCaffer (1998). Ismael (1996) reported time overrun is endemic to water construction projects in Ethiopia. He discussed the magnitude of delays in percentage and he had examined 13 projects in Ethiopia and obtained the delays encountered in most of the projects range between 100% and 460% of the original contract time. Project delay is the major cause of claims of time extension and associated contractures, consultant finance and monitoring.

There are needs to establish a tool to estimate construction time performance. According to Tebeje (2016), timely and with budget completion of a construction project frequently seen as a major criterion of project success by clients, contractors, consultants and related stakeholders. Schedule delay could define as a discrepancy where actual completion of the project exceeds the planned period according to the contract (Chabota et al., 2008). One of the most important those are due to:

Contractors Responsibility

The factors that are related to contractor's responsibility are:

A contract problem that may arise in construction project is delays and the magnitude of these delays varies considerably from project to project. According to delay categories that were contractor related, client related, consultant related, labor related monitoring and finance related. They have categorized the factors that cause delays in the four categories,

- ✓ Variations
- ✓ Changes in scope
- ✓ Unexpected ground and weather conditions
- ✓ Poor qualification of the technical staffs
- ✓ Poor skills and experience of labor.

Financing

- ✓ Adequacy of project budget
- ✓ Timely payments of contractor's certificates
- ✓ Contractor's financial capacity
- ✓ Conflicts in sub -contractors schedule in execution of project

Monitoring

- ✓ Adequacy of supervisory personnel
- ✓ Ability to Effectively supervise the project
- ✓ Timely approvals and actions on decisions

Consultant's Responsibility

The factors that are related to consultants' responsibility are:

- ✓ Contractor's capacity
- ✓ Experience
- ✓ Ability to effectively plan and schedule project activities
- ✓ Sufficiency of equipment
- ✓ Lack/ inadequate/ of experience

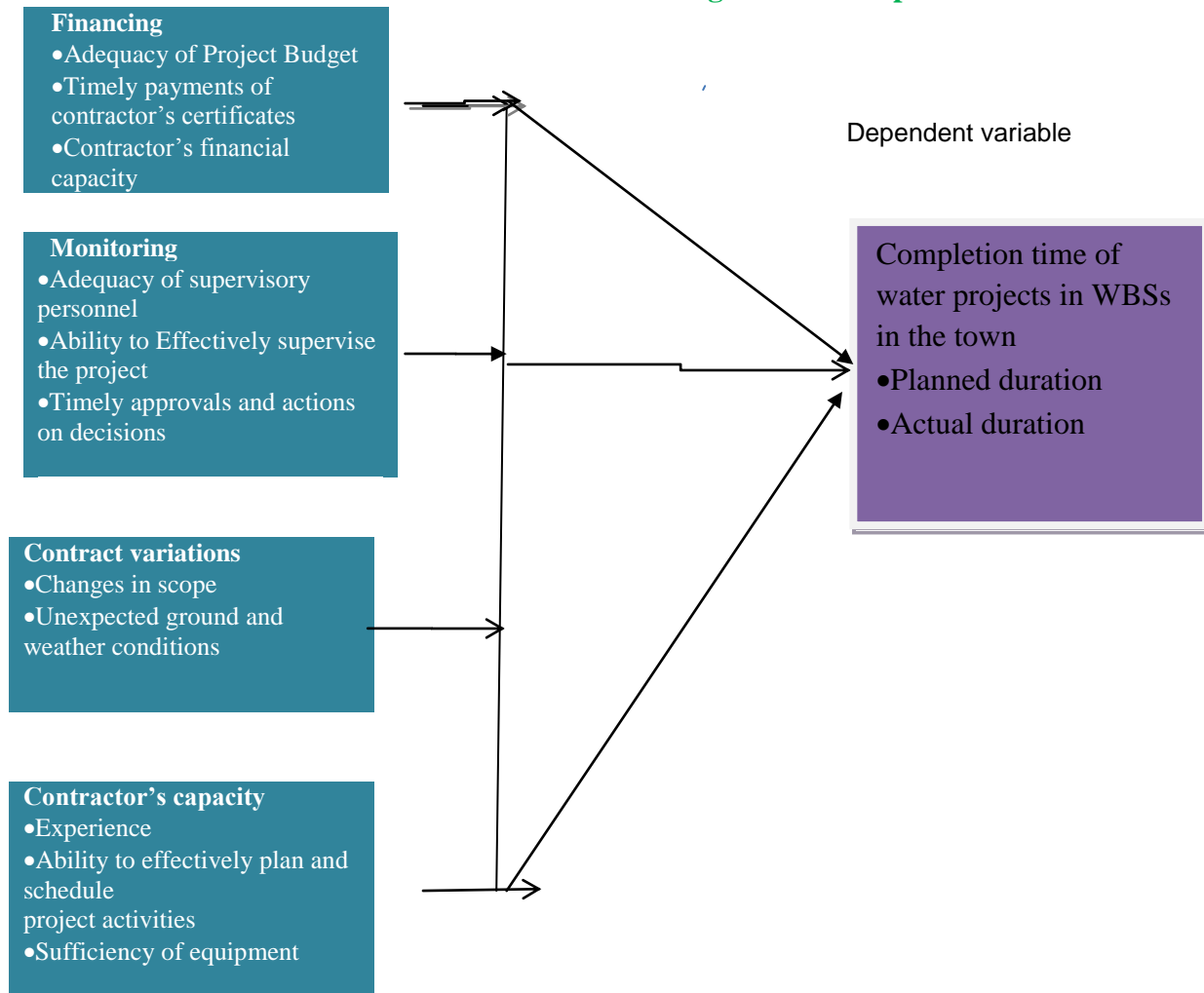
2.5 Conceptual Framework

A conceptual framework is a representation of the main concepts or variables under study and their presumed relationship with each other. It is a scheme of variables/concepts the researcher will operation in order to achieve the research objectives. The conceptual framework will be based on factors affecting completion time of water projects in Jimma town. The dependent

variable completion time of water projects is affected by independent variables: Financing, monitoring, contractor's capacity and contract variations. This study will be based on the conceptual framework shown in Figure 1

In dependent variable

Figure 1: Conceptual Framework



CHAPTER THREE

3. RESEARCH METHODOLOGY

3.1 Introduction

This chapter was given an explanation and justification of the methods that was used in order to answer the research questions posed. It also outlines the systematic research procedures t used in the collection and analysis of data. These include the project's research design, target population, sample and sampling procedure, data collection instruments and finally how the data collected and analyzed.

3.2 Research Design

According to Cooper and Schindler (2008) a research design is a statement of the essential elements of a study and constitutes the plan for the collection, measurement and analysis of data.

It refers to the systematic prepared structure of an enquiry that directs a research study (Shajahan, 2005). Its function is to ensure that the evidence obtained enables the researcher to answer the research question as unambiguously as possible. This research is categorized as both applied and descriptive research. The aim of this study would be to investigate the effect of financing, monitoring, contractor's capacity and contract variations on the completion time of water projects in Water Services office and in particular Dado and Kersa woredas.

This study would be adopted a descriptive and explanatory survey research design where interviews, desk study of documents relevant to the projects and self-administered questionnaires would be used for data collection. Kothari (2004) describes descriptive surveys as fact -finding enquiries, involving asking questions (often in the form of a questionnaire) to a large group of individuals; whose major purpose is to describe the state of affairs as it exists at present and represent the findings/information statistically. Similarly, Mugenda and Mugenda (2003) states that a descriptive survey design determines and reports the way things are or answers questions concerning the current status of the subjects in the study, while Cooper & Schindler (2003) obtains that a descriptive study is concerned with establishing the what, where and how of a

phenomenon. Moreover, to achieve the objectives sought, the study would also employ analytical or explanatory research design in addition to the descriptive design (as there was a cause and effect relationship between dependent and independent variables).

3.3 Target Population

. The study population consist of both completed and ongoing water supply projects undertaken by Jimma Zone Water Service office within the last three years (2008—2010 E.C.) in Dedo and Kersa woreda. As in 2010, 6 projects have been completed and 3 projects are ongoing, there for, total 9 projects and 27 target populations were studied. Target population drawn from persons involved in the implementation three (3) persons from each of the 9 projects. in this study as per the projects' implementation teams; that was, the Clients (personnel), Contractors and Consultants

3.4 Sample size and Sampling procedure

A sample was a subset of a study's target population on which information was obtained for generalization to the target population while sampling was the process of selecting the individuals of a sample which ensures that the sample was representative of the target population.

3.4.1 Sample Size determination method

Sample size determination is the act of choosing the number of observation or replication to include in a statistical sample. The sample size is an important feature of any empirical study in which the goal is to make inference about a population from a sample. In practice the sample size used in a study is usually determined based on the cost, time, or convenience of collecting the data, and the need for it to offer sufficient statistical power. Therefore, the sample would be expected to study all of the 9 targeted projects gave a clear indication of the factors that affects the completion time of water projects in Jimma particularly Dedo and Kersa woreda. The survey sample of respondents used in carrying out the study was census and stratified survey drawn. Census survey used to seek for an entire population, hence the intended sample size was equal to the population. Therefore , 27 respondents or sample were taken from each 9 projects and stratified survey used to determine the sample different sizes for each stratum such as Clients

(Personnel), Contractors and Consultants from these strata of 9 projects 27 sample or respondent were taken. The target population comprised of individuals working in water projects in Dado and in Kersa and construction personnel (client), Contractors and consultants in the woreda. The total numbers of people targeted were 27 however the target population was small. Therefore, total number of target people selected by census survey method to be respondents from persons involved in the implementation of each of the 9 projects in this study as per the projects' implementation teams; that was, the Clients (Personnel), Contractors and Consultants.

3.4.2 Sampling Procedure of Respondents

Sampling procedure may be defined as a systematic process of identifying individuals for a study to represent the larger group from which they were selected (Mugenda and Mugenda, 2003). To obtain the sample population of respondents the target population probability sampling techniques were used. It was based on the fact that every member of a population had a known and equal chance of being selected. The population were 27 each person 1-27 would have been chosen. It refers to sampling techniques first stratified. Stratification involves dividing the population into homogeneous subgroups (strata) and then taking a sample from each stratum independently of each other. It is generally used when the population is heterogeneous, or dissimilar or where certain homogeneous, or similar, sub-populations can be isolated (Patton, 1990). According to Mugenda and Mugenda (2003), the goal of stratified sampling is to achieve desired representation from various subgroups in the population. The total number of target people of 27n respondents was obtained by representing each of the three implementation groups as study subjects. Project engineer's represented the client, site agents/engineers the contractor and resident engineers the consultant. Three persons from each of the 9 projects gave a total of 27 subjects was used in the study

3.5 Data Collection Instruments

The study were used questionnaires and unstructured interviews to collect primary data while content analysis of information relevant to the implementation of the projects from the Water Supply Service used to provide the required primary data. Questionnaires were chosen because they are easy to administer, gives the respondent sufficient time to arrive at a well thought out response and are free from the researcher's bias. Open and close ended questions were used to get information on completion time of the projects and the factors influencing their completion

time. Interviews was used to help clarify issues that may not had been dealt with satisfactorily by the respondents through the questionnaire while content analysis enabled the researcher gain deeper insight of the activities that was taken place during the implementation of the projects and the underlying factors involved in the activities that had an influence on the completion time of the projects.

3.5.1 Data quality assurance

The data collection tool was developed and pretested prior to the data collection to assess clarity, flow, validity understandability, consistency, and reliability with area expert opinion and content review through literature. Briefing was done to data collectors. Data completeness and consistency were checked by the investigators. The Principal investigator was discussed with the research assistant's on regular basis and reviews the collected data for completeness. The collected data was summarized on the same day of the data collection. Data cleaning and editing were taken regularly.

3.6 Data Analysis

The data analysis methods was used depend on the type of research design to be employed, the nature of data collection and measurement method used. The study was based on explanatory design in addition to the descriptive research design. Descriptive analysis describes a phenomenon in statistical terms as it happens or in an expose-facto sense. Data was quantitative and qualitative; measured on ratio and nominal scales. It was therefore have been analyzed both qualitatively and quantitatively using the Statistical Package for Social Scientists (SPSS) version 20. The received questionnaires were first had been checked for completeness and then coded as per the research questions. Qualitative data analysis was used to summarize Information gathered from Questioner and data into relevant themes according to the research questions. Themes of words generated by the open ended questions in the questionnaires were also qualitatively was analyzed and added into the summary of themes. Quantitative data were analyzed using descriptive statistics calculate as proportions, frequencies and percentages. Pearson correlation was used to determine the strength and direction of association, and linear regression analysis to establish cause and effect of relationships between the variables and to help identify significant predictors of completion time.

3.8 Ethical Consideration

Ethical issues related to the study was addressed by maintaining high level confidentiality of the information volunteered by the respondents and not using the information for other purposes other than drawing the conclusion of the study. The names of the respondents were not requirement and if known to the researcher was not disclosed to protect their identities. All personal details were limited to general information. Permission was sought from the Chief Executive Officer to collect data from the respondents and a letter of introduction to respondents attached to each questionnaire.

3.9 Study Variables and Measurements

Variable	Measurement	Expectation sign
Project success	Project completed on time	
Financial management practice	Scoping, feasibility, and design	Positive
Monitoring and controlling process	Updates to project documents like the project plan, and change requests	Positive
Contractor's capacity	Perception of the contractors' ability to plan and schedule project activities experience	positive
Contract variation	Duration, schedule development and control	positive
Project completion on scheduled time	Number of completed on time and ongoing projects	

CHAPTER FOUR

4. FINDINGS AND DISCUSSION

4.1. Introduction

This chapter presents the results obtained from the study. It includes the general information of the respondents that were targeted in the study. The presentation provides raw data followed by discussions. Analysis was based on the research objectives and the independent variables. The data were analyzed and presented in frequencies and converted in to percentages and thereafter presented into tabular forms to make it is easy to understand and interpret. The total number of questionnaires administered for the study was 27 and all of them were returned. The main reasons for the high return rate were that contact persons were appointed individuals of good repute and were reminded through their email addresses. In case one failed to return the questionnaire it was given to a more reliable person. The findings of the study have been discussed under thematic areas and sub-sections in line with the study variables and objectives. The thematic areas include: study demographics, projects compliance to schedule, Financing, monitoring, contractor's capacity and contract variations.

4.2 Questionnaire Response Rate

A questionnaire with open and close-ended questions was administered to 27 project implementation team leaders of 6 completed and 3 ongoing water projects implemented by OWSS in Jimma Zone Specially in Dado and Kersa woredas within the last three years. The team leaders were selected on the basis of their practical experience in the construction of the projects in this study. They were also expected to have had sufficient experience in project management. It was therefore expected that their experiences would provide accurate information on the key factors influencing the completion time of water projects in WSSs from the clients, contractors and consultants perspective. All the questionnaires distributed to 27 implementation team leaders of the projects; clients, consultants and contractors in the 9 study projects were completed and returned . This represented a 100% response rate which was ideal for the purpose of this study.

The collected data was then edited to ensure consistency across the respondents and locate any omissions or errors and clarifications sought from the members of JWSS management team on issues that were not clear. The data was then summarized, coded and analyzed using descriptive statistics using the Statistical Package for Social Science (SPSS) version 20. Multiple Linear Regression analysis was used to establish cause and effect of relationships between the variables and to help identify significant predictors of completion time while Pearson correlation was used to determine the strength and direction of variable associations. The findings are presented in tables which form a suitable basis for arriving at important findings and conclusions.

4.3 Demographic Characteristics of Respondents

The demographics of respondents were as categorized in the following sections:

4.3.1 Distribution of Respondents by Project Implementation Teams

Respondents were requested to indicate the organisations that they worked so as to gauge the extent to which the three project implementation teams were represented

Table 4.1: Respondent's Organizations

Type of Organisation	Frequency	Frequency %	Commulative Frequency%
Client	13	48.148%	48.148%
Consultant	6	22.22%	70.37%
Contractor	8	29.63%	100%
Total	27	100%	100%

Source: Own Survey, 2020 from Jimma zone WSPS and from the two woredas project

As shown in Table 4.1, the resulting distribution of the 27 respondents among the three organisations was (48.148%) clients, (22.22%) consultants and (29.37%) contractors indicating adequate representation of views from the three groups of respondents.

4.3.2 Distribution of Respondents by job title

Respondents were also requested to indicate their job titles.

Table 4.2: Job Titles of the Respondents

Job Title of respondent	Frequency	Frequency	% commulative frequency
Project Engineers	10	37.037%	37.037%
Site Agents	12	44.44%	81.48%
Resident Engineers	5	18.52%	100%
Total	27	100%	100%

Source: Own Survey, 2020 from Jimma zone WSPS and from the two woredas project

The resulting distribution of the 37 respondents among the three organisations was (37.037%) clients, (44.44%) consultants and (18.52%) contractors indicating adequate representation of views from the three groups of respondents. Project engineers represented the client-OWSS, site agents the consultants and resident engineers the contractors. These categories of respondents had had practical experience in the construction of the projects under study. It was therefore expected that the information they gave was valid and reliable.

4.3.3 Summary of respondents' years of experience

Respondents were asked to state their years of experience in the field of construction. Average number of years of experience of client respondents was 9 years, average number of years of experience of consultants' respondents was 8 years, average number of years of experience of contractors' respondents was 9 years. All the respondents therefore had experience of more than 7 years which was deemed to be adequate in infrastructure project management.

4.3.4 Other Similar projects executed by the respondents

Respondents were requested to indicate the number of similar projects that they had executed in the past. Their responses are summarised in table 4.3. All the respondents therefore had experience of more than 7 years which was deemed to be adequate in infrastructure project management.

Similar projects executed	Frequency	Frequency%	Cumulative % Frequency
1 to 5	3	11.11%	11.11%
6to 10	20	74.074%	85.2%
11 to 15	4	14.8%	100%
More than 15	0	0%	0%
Total	27	100%	100%

Table 4.3 Number of other similar projects Executed

The results in this table indicated that 85.2% of all the respondents had implemented more than 7 similar projects; a good indication of their wealth of experience. It was therefore expected that their experiences provided reliable information on factors influencing the completion time of the water projects from the perspective of the clients, consultants and contractors.

4.4.Completion timeliness of projects

Of the completed projects, the respondents were asked to indicate whether they were completed as per the initial schedule (time). The responses are given in table 4.5

Table 4.4: Project's Completion Time line

Project's completion was timely	Frequency	% frequency	Cumulative % frequency
Strongly agree	9	33.33%	33.33%
Agree	2	7.407%	40.7403%
Disagree	10	37.037%	77.78%
Strongly disagree	6	22.22%	100%
Total	27	100%	100%

Sources: Own Survey, 2020 from Jimmazon WSPS and from the two woredas project

The results showed that 40.74% of the projects were completed as per the initial schedule while 59.26% were not completed on schedule.

4.4.1. Schedule Status of the Ongoing Projects

Of the ongoing projects, respondents were required to indicate whether they were on schedule

Table 4.5: Ongoing Project's Schedule Status

Project was on Schedule	frequency	% frequency	Cumulative % frequency
Strongly agree	0	0%	0%
Agree	3	11.11%	11.11%
Disagree	13	48.148%	59.26%
Strongly disagree	11	40.740%	100%
Total	27	100%	100%

Source: Own Survey, 2020 from Jimmazon WSPS and from the two woredas project

The results showed that all the ongoing projects were behind schedule. All other factors remaining constant, it was most likely that those ongoing projects behind schedule would be completed late. From the results in tables 4.5 and 4.6 it is clear that; only 3 (33.33%) of the studied projects had achieved timely completion while 6 (66.67%) had delayed completion indicating that delay in completion of water projects in Jimma woredas are a big challenge.

4.5 Financing and Project Completion Time

The first objective of this study was to determine how financing influences the completion time of water projects in WSBs. Financing provides the monetary resources required to meet the project construction budget as Represented by the project's bill of quantities.

Inadequate construction funding and budgets , and bad cash flow that may be occasioned by contractor’s and client’s financial difficulties, have a heavy bearing on the project smooth running leading to delayed completion of a project.

4.5.1 Adequacy of the Projects’ budgets

Respondents were requested to indicate whether the projects’ budgets were adequate.

Table 4.7: Adequacy of Project's Budget

Project’s budget was adequate	frequency	% frequency	Cumulative % frequency
Strongly agree	12	44.44%	44.44%
Agree	7	23.926%	70,37%
Disagree	5	18.518%	88.89%
Strongly agree	3	11.11%	100%
Total	27	100%	100%

Source: Own Survey, 2020 from Jimma one WSPS and from the two woredas project

The results indicated that 70.37 % of the projects had adequate budgets while in 29.63% the projects budgets were inadequate.

4.5.2 Timeliness of payments of contractors’ certificates

Respondents were requested to indicate whether payments of contractors’ certificates were made on time. Timely payment of contractors’ certificates ensures contractors have funds to enable them adequately finance construction activities within the required time frame.

Table 4.8: Timeliness of Payments of Contractors’ Certificates

Payments of Contractors Certificates were made on time	Frequency	Frequency%	Cumulative %frequency
Strongly agree	2	7.4%	7.4%
Agree	8	29.6%	37%

Disagree	6	22.3%	59.3%
Strongly agree	11	40.7%	100%
Total	27	100%	100%

Source: Own Survey, 2020 from Jimmazon WSPS and from the two woredas project

The results showed that only 37% of respondents indicated that payments of contractors' certificates were always or often made on time while 63% of respondents indicated that payments of contractors' certificates were at times or rarely made on time even though majority of the respondents (66.67%) indicated that project budgets were adequate. It is possible that this high level of delay in making payments to the contractor contributed to the high percentage (66.67%) of delayed project completions observed in this study. Project clients (WSBs) will have to thus make efforts to pay contractors' certificates on time to enable timely execution of projects construction activities if the projects are to be completed as initially scheduled

4.5.3 Contractor's Financial Capacity

In order to gauge the contractors' financial capacity, respondents' opinion of the contractors' financial difficulties was sought. Contractor's financial difficulties contribute to inadequate construction funding leading to contract's time extension among other negative effects. Their responses are summarized in table 4.9

Table 4.9: Contractor's Financial Capacity

Contractor allocate appropriate finance for the project	Frequency	Frequency	Cumulative % Frequency
Strongly agree	10	37.037%	37.037%
Agree	8	29.6%	66.67%
Disagree	5	18.53%	85.%
Strongly disagree	4	14.8%	100%
Total	27	100%	100%

Source: Own Survey, 2020 from Jimma zone WSPS and from the two woredas project

66.67% of the respondents agreed that the contractor did not have financial difficulties while 33.33% of respondents were not agreed as contractor had no financial difficulty disagreed. Financial difficulties of the contractor may be occasioned by the client’s failure to honor contractual payment agreements made between them and the contractors and / or contractor’s inability to effectively manage the project finances.

4.5.4 Influence of timely payments of contractors’ certificates on projects’ completion time

Respondents’ opinion of the influence of timely payments of contractor’s certificates on projects’ completion time was also sought

Table 4.10: Influence of Timely Payments to Contractors on Project’s Completion Time

Influence of timely Payments to contractors	Frequency	Frequency%	Cumulative % Frequency
Strongly agree	19	70,37%	70.37%
Agree	3	11.11%	81.48%
Disagree	4	14.81%	96.3%
Strongly disagree	1	3.7%	100%
Total	27	100%	100%

Source: Own Survey, 2020 from Jimma zone WSPS and from the two wored project

81.48 of the respondents were of the opinion that timely payments of contractors’ certificates had much influence on the completion time of the projects while 18.52 of the respondents were not agreed that as timely payment of contractors’ certificates influence the completion time of the project. as shown in table 4.10

Source: Own Survey, 2020 from Jimmazon WSPS and from the two wored project

4.6 Monitoring and Project’s Completion Time

The second objective of this study was to establish how monitoring influences the completion time of water projects in WSBs .Effective project monitoring helps project managers ensure that projects are on track to completion by certain deadlines by comparing actual performance with planned performance and taking timely corrective actions to yield desired outcomes whenever

significant deviations occur. To achieve this, the supervisory personnel should be enough and of the required skills.

4.6.1 Adequacy of Supervisory Teams

Respondents were required to indicate their opinion of the adequacy of the projects supervisory teams.

Table 4.11: Adequacy of Supervisory Teams

Adequacy of supervisory Team	Frequency	Frequency%	Cumulative% Frequency
Strongly agree	2	7.4%	7.4%
Agree	4	14.8%	22.2%
Disagree	12	44.4%	66.6%
Strongly disagree	9	33.4%	100%
Total	27	100%	100%

Source: Own Survey, 2020 from Jimma zone WSPS and from the two woredas project

Only 22.2% of the respondents were of the opinion that supervisory teams were adequate while the remaining 77.8% disagreed.

4.6.2 Ability to effectively supervise the projects

This section of the study aimed at gauging the effectiveness of the projects monitoring process by asking the respondents to indicate their opinion of the supervisors' ability to effectively supervise the projects.

Table 4.12: Supervisor's Ability for Effective Supervision

Supervisor's ability for effective supervision	Frequency	Frequency%	Cumulative Frequency%
Strongly agree	0	0%	0%
Agree	6	22.2%	22.2%
Disagree	13	48.2%	70.4%
Strongly disagree	8	29.6%	100%
Total	27	100%	100%

Source: Own Survey, 2020 from Jimma zone WSPS and from the two woredas project

As shown in table 4.12, the ability of the supervisors to effectively supervise the projects was rated as agree in only 22.2% of the projects. This percentage was the same as that of the projects in which supervision teams were adequate while in the other 77.8%; supervisory ability was rated poor.

4.6.3 Timeliness in Making of Approvals and Decisions

Whenever deviations from planned targets are detected; decisions on appropriate actions should be made immediately to avoid the deviation getting to an unmanageable level. At the same time, approvals to execute construction activities should be obtained before engaging the contractor in order to avoid conflicts during implementation. This helps ensure that the project's planned scope and / or contract duration is achieved. To gauge the timeliness of approvals and decisions making, respondents were requested to indicate whether decisions and approvals were made on time

4.7 Contractor's capacity and project completion time

The second objective of this study was to examine how the contractor's capacity influences the completion time of water projects in WSBs. The contractor's capacity for effective construction management which entails planning and scheduling project activities and maximizing of the resource efficiency through procurement of sufficient equipment, materials and personnel is paramount during the project's construction stage if the project's stipulated targets are to be achieved. Such capacity improves through experience in the construction field acquired through regular undertaking of projects

4.7.1 Contractor's experience in undertaking similar projects

Respondents were asked to indicate whether the contractors had enough experience in undertaking similar projects. Their responses are summarized in table 4.16 below

Table 4.16: Contractors' Experience in Similar Projects

Contractor had adequate Experience in similar projects	Frequency	Frequency%	Cumulative Frequency%
Strongly agree	11	40.7%	40.7%
Agree	13	48.2%	88.9%
Strongly disagree	3	11.1%	11.1%
Disagree	0	0%	100%
Total	27	100%	100%

Source: Own Survey, 2020 from Jimmazon WSPS and from the two woredasproject

88.9% of the respondents agreed that contractors in their projects had adequate experience in undertaking similar projects while the other 11.1% disagreed. These results were consistent with the findings in this study (table 4 .3) indicating that majority of the respondents (85.6%) had executed more than 7 other similar projects.

4.7.2 Contractor's Planning and Scheduling Capacity

Respondents were asked to rate the contractor's ability to effectively plan and schedule project activities. Their responses are summarized in table 4.17

Table 4.17: Contractors' Planning and Scheduling Capacity

Contractor's ability for effective planning and scheduling	Frequency	Frequency%	Cumulative Frequency%
Strongly agree	0	0%	0%
Agree	8	29.7%	29.7%
Disagree	10	37%	66.7%
Strongly disagree	9	33.3%	33.3
Total	27	100%	100%

Source: Own Survey, 2020 from Jimmazon WSPS and from the two woredasproject

Planning and scheduling was rated good in only 29.7% of the projects while it was rated as being poor or very poor in 70.3% of the projects.

4.7.3 Equipment Sufficiency

Respondents' opinion of the contractors' equipment capacity was sought and their responses summarized in table 4.18.

Table 4.18: Contractors' Sufficiency of Equipment

Contractor had sufficient equipment	Frequency	Frequency%	Cumulative Frequency%
Strongly agree	0	0%	0%
Agree	10	37%	37%
Disagree	7	26%	63%
Strongly disagree	10	37%	37%
Total	27	100%	100%

Source: Own Survey, 2020 from Jimmazon WSPS and from the two woredasproject

The results showed that contractors in only 37.0% of the projects had sufficient equipment while contractors in 63.0% of the projects did not have sufficient equipment.

4.7.4 Contractor had enough personnel and of required skills

Respondents were also requested to indicate their opinion of the contractor's capacity for sufficient personnel.

Table 4.19: Contractor s' Sufficiency of Skilled Personnel

Contractor had enough personnel of required skill	Frequency	Frequency%	Cumulative Frequency%
Strongly agree	0	0	0%
Agree	12	44%	44%
Disagree	7	26%	70%
Strongly disagree	8	30%	30%
Total	27	100%	100%

Source: Own Survey, 2020 from Jimmazon WSPS and from the two woredasproject

Respondents agreed that contractors had sufficient personnel of the required skills in 44.4% of the projects while in 56.6% of the projects the contractor did not have sufficient personnel. From the findings in this section; it is evident that though the contractors' experience in undertaking similar projects was adequate in 88.9% of the projects; their capacity in construction management was highly deficient.

4.7.5 The extent to which contractors' capacity influences projects' completion time

Respondents were requested to indicate the extent to which contractor's capacity influences a project's completion time. Table 4.20 indicates their responses

Table 4.20: Influence of Contractor's Capacity on Projects Completion Time

Influence of contractor's capacity on a project's completion time	Frequency	Frequency%	Cumulative Frequency%
Strongly agree	8	29.6%	29.6%
Agree	19	70.4%	100%
Disagree	0	0%	0%
Strongly disagree	0	0%	0%
Total	27	100%	100%

Source: Own Survey, 2020 from Jimmazon WSPS and from the two woredas project

The results in the table indicate that all the respondents were of the opinion that it did to a large extent.

4.8 Contract variations and project completion time

The fourth objective was to establish the extent to which contract variations influence project completion time. Contract variations are admissible deviations in contractual agreements that may be occasioned by unforeseen problem areas such as unexpected weather and ground conditions that occur during project implementations. Such problem areas impact negatively on a project's targets of time, cost, quality and scope

4.8.1 Frequency of variations in the projects

Respondents were asked to rate the frequency of variations in the projects.

Table 4.21: Frequency of Variations in the Projects

Frequency of variations	Frequency	Frequency%	Cumulative Frequency%
Very many	1	3.7%	3.7%
Many	10	37.0%	40.7%
Few	14	51.9%	92.6%
None	2	7.4%	100%
Total	27	100%	100%

Source: Own Survey, 2020 from Jimmazon WSPS and from the two woredasproject

Variations were rated very many or many in 40.7% of the projects and few or none in 59.3% of the projects as shown in table 4.21.

4.9 Correlation Analysis of the Variables

To determine the strength of the independent variables in predicting the dependent variable (completion time of water projects) and the direction of their relationship with the dependent variable, a bi-variant analysis was done and Pearson correlation coefficient (r) computed and tested at 0.01 (1%) significant levels.

Table 4.22 Correlation Coefficients of Variables

		Project Comp. Time Total Value	Financing Total Value	Monitoring Total Value	Contractor's Capacity Total Value	Contract Variation Total Value
Project completion time Total	Pearson correlation Sig. (2-	1	0.432	0.448	0.702	-0.282
				0.173	0.001	0.617

Value	tailed) N			27	27	27
Financing Total Value	Pearson correlation Sig. (2- tailed) N	0.432 0.178 27	1 27	0.443 0.066 27	0.120 0.617 27	0.079 0.156 27
Monitorin g Total Value	Pearson correlation Sig. (2- tailed) N	0.478 0.173 27	0.443 0.066 27	0.01 27	0.179 0.476 27	0.217 0.046 27
Contractor 's Capacity Total Value	Pearson correlation Sig. (2- tailed) N	0.702 0.001 27	0.120 0.637 27	0.179 0.476 27	1 27	0.195 0.660 27
Contract Variations N		- 0.282 0.617 27	0.079 0.156 27	0.217 0.046 27	0.195 0.660 27	1 27

Correlation is significant at the 0.01level (2-tailed)

Results from table 4.22 showed the following relationships.

The Table showed there is a moderate but positive relationship between financing and project completion time ($r = 0.432$, $p < 0.01$), because $p = 0.178$ because $p = 0.173$ which was statistically significant. The relationship were computed to determine the influence of financing on the

completion time of the water projects showed that 19% of variations in project completion time can be attributed to financing, all other factors remaining constant.

There was a moderate but positive relationship between monitoring and project completion time ($r = 0.448$, $p < 0.01$), because $p = 0.173$ which was statistically significant. The relation were showed that 20% of variations in project completion time can be attributed to financing, all other factors remaining constant

There was statistically significant moderate but positive relationship between contractor's capacity and project completion time ($r = 0.702$, $p < 0.01$) level because $p = 0.001$. It showed that 49% of variations in project completion time can be attributed to contractor's capacity, all other factors remaining constant..

There was a weak but significant negative relationship between contract variations and project completion time ($r = -0.289$, $p < 0.01$) which was statistically significant because $p = 0.617$. It showed that 8 % of variations in completion time can be attributed to contract variations, all other factors remaining constant.

4.8.2 Most influential variation on the completion time of the projects

The respondents were requested to identify from a list of three variations the one they thought was most influential on the completion time of their projects. Their responses are as shown in table 4.22

4.9 Regression of Variables

In order to get the importance of each of the four independent variables (Financing, monitoring, contractor's capacity, contract variations) and their contribution to the completion time of the projects a multiple regression analysis was carried out. The beta coefficients computed indicate the slope of the regression line while t-test is at 1% significant level. This is illustrated in table 4.25 below.

Table 4.25: Beta Coefficients of Regression of Variables

Mode	Unstandardized	Standardized	T	Sig. (@ 1%)
	Coefficient	Coefficients		
	B	Std error	Beta	
Constant	2.721	0.77		5.654 0.000
Financing	0.453	0.241	0.534	0.256 0.003
Monitoring	1.967	0.656	0.323	0.198 0.002
Contractor's capacity	2.254	0.437	0.356	0.199 0.001
Contract variations	0.233	0.296	0.237	0.567 0.004

Model Summary on Combined effect

	R	R-Square	Adjusted R square	Std. Error of the Estimate
	0.375	0.540625	0.093025	0.16605

The regression model generally assumes the following equation.

$$Y = \beta_0 + \beta X_1 + \beta X_2 + \beta X_3 + \beta X_4 + e$$

Where;

Y = Project completion time –The dependent variable

β_0 = this is the Y –intercept which is a constant not a variable

X1= financing

X2= monitoring

X3= contractor's capacity

X4= contract variations

e = error; variable which represents all the factors that affect the dependent variable but were not included in the model either because they were difficult to measure or not known. From the

regression findings, the substitution of the equation ($Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + e$) becomes:

$$Y = 2.721 + 0.256X_1 + 0.323X_2 + 0.356X_3 - 0.237X_4 + 0.77$$

$$y = 2.721 + 0.256\text{financing} + 0.323\text{monitoring} + 0.356\text{contractor's capacity} - 0.237\text{variations} + 0.77$$

According to the equation, taking all factors (Financing, monitoring, contractor's capacity and contract variations) constant at zero, timely completion of the projects will be 2.721.

The data findings also showed that a unit increase in financing effectiveness will lead to a 0.534 increase in timely completion of projects; a unit increase in monitoring effectiveness will lead to a 0.323 increase in timely completion of the projects; a unit increase in contractor's capacity will lead to a 0.356 increase in timely completion of the projects; and a unit increase in contract variations will lead to a 0.237 decrease in timely completion of the projects. This means that the most significant factor is contractor's capacity followed by monitoring.

At 1% level of significance and 99% level of confidence, financing had a 0.003 level of significance; monitoring 0.002, contractor's capacity 0.001 level of significance while contract Variations had a 0.004 level of significance implying that the most significant factor is contractor's capacity followed by monitoring of projects.

The following section presents discussion of findings under the various thematic areas.

Effects of Financing on completion time of water projects

The first objective of the study was to determine how financing influences the completion time of water projects. The findings showed a positive relationship between financing and completion time of the projects. The findings also showed that although a significant percentage of the respondents indicated that budgets in their projects were adequate, payments of contractors' certificates in majority of the projects were only at times or rarely made on time and that 55.6% of the contractors had financial difficulties. Additionally there was delay in completion of 6 out of the 9 projects studied implying delay in completion of water projects in Jimma zone Dedo and kersa woreda is a big challenge.

These findings relate with the literature review where Devarpiya&Ganesan(2008) stated that inadequate construction funding and budgets as well as bad cash flow that may be occasioned by contractor's and client's financial difficulties have a heavy bearing on a project's smooth Running leading to delayed completion of a project, while Thomas (2009) obtained that financing is a major success criterion of construction projects.

Therefore, it is important that clients and contractors avail adequate funds and at the required time to enable timely facilitation of project activities and by extension timely completion of projects.

Effects of monitoring on completion time of water projects

The second objective of the study was to establish the influence of monitoring on the completion time of water projects. From the findings, project supervision was rated poor in most of the projects. Poor supervision was also evidenced by the high percentage of projects in which supervisory teams were inadequate and actions to decisions were not taken on time. This finding relates with the literature review in which OWSPS in its annual report observed that monitoring of investment implementation in the WSBs continues to be poor despite the effort by the ministry of water and irrigation to streamline investment planning and monitoring, while Chan and Kumaraswamy (1998) found that low speed of decision making involving all project teams was one of the most significant factors causing delays in completion of construction works.

Effective project supervision is a monitoring strategy that enables the project manager to detect deviations in project targets and implement corrective measures before they go out of hand and impact negatively on project targets of scheduled

Effects of contractor's capacity on completion time of water projects

The third objective of the study was to examine how contractor's capacity influences the completion time of water projects. The study found that most of the respondents indicated that though most of the contractors had adequate experience in undertaking similar projects, most of them had incompetence attributed to inadequate personnel and equipment, and inability to effectively plan and schedule project activities. All the respondents were of the opinion that contractor's capacity influenced completion time of the projects to a large extent. These findings

relate with the literature review where Chan and Kumaraswamy (2002) concluded that Contractor's incompetence/inadequacy attributed to problems such as delayed procurement of equipment and materials, labor shortages or engaging inadequate labor skills is a key factor contributing to time overruns in construction projects globally, While Xiao and Proverbs (2003) and Sambasivan and Soon (2007) assert that contractor's construction management capacity ranks among the ten most common factors influencing successful completion of projects. The contractor's capacity for effective construction management which is the overall planning, coordination and control of project activities and resources from the beginning to the completion is paramount for timely completion of the project.

Effects of contract variations on completion time of water projects

The fourth objective of the study was to establish the influence of contract variations on the completion time of water projects. The study found that there were contract variations in majority of the projects and that unexpected ground conditions was the most frequent variation. These findings relate with literature review where Chan and Kumaraswamy (1998) found that unexpected problems arise during the construction phase leading to contract variations and that unforeseen ground conditions are among the most significant such problems causing delays in completion of projects

It is therefore important that the project manager makes adequate initial arrangements for forecasting mechanisms to be included in the implementation plan to enable identification of any potential threats early enough so that appropriate action is taken to minimize their impact on the project.

A moderate positive relationship ($r = 0.432$) between financing and project completion time which was statistically significant at 1% level because $p=0.178$. A coefficient of determination (r^2) computed to determine the influence of financing on the completion time of the water projects showed that 19% of variations in project completion time can be attributed to financing, all other factors remaining constant.

A moderate positive relationship ($r = 0.448$) between monitoring and project completion time which was statistically significant at 1% level because $p=0.173$. The coefficient of determination (r^2) showed that 20% Of variations in project completion time can be attributed to financing, all other factors remaining constant.

A statistically significant moderate positive relationship ($r = 0.702$) between contractor's capacity and project completion time at 1% level because $p=0.001$. The coefficient of determination (r^2) showed that 49% of variations in project completion time can be attributed to contractor's capacity, all other factors remaining constant.

A low negative relationship between contract variations and project completion time ($r = - 0.289$) which was statistically significant at 1% level because $p=0.617$. The coefficient of determination (r^2) showed that 8% of variations in completion time can be attributed to contract variations, all other factors remaining constant.

The four independent variables that were studied account for 96% of the completion time of the water projects. This therefore means that other factors not studied in this research contribute 4% 70 of variance in the dependent variable. Further research should therefore be conducted to establish the factors influencing the completion time of water projects in Jimma zone Dedo and Kersa woreda

CHAPTER FIVE

5. CONCLUSIONS ANDRECOMMENDATIONS

5.1 Introduction

This chapter summarizes and discusses the findings of the study and presents conclusions, recommendations and suggestions for further research. The purpose of this study was to investigate factors influencing the completion time of both complete and ongoing water projects in Jimma zone ,dedo and kersa woredas. The variables examined were Financing, monitoring, contractor's capacity and contract variations during the implementation phases of the projects. The study used a purposive sample of respondents all of whom were project engineers representing the clients, contractors and consultants and who were involved in the implementation of the projects

5.2 Summary of Findings

The study sampled 9 projects from the following categories; 6 completed and 3 ongoing water projects, and 27 respondents such as (clients, consultants and contractors). The result of the study is that the mean percentage of time elapsed for the sampled projects 66.6% and the projects were at an average completion and 33.3% projects were ongoing.

Nine projects;6 complete and 3ongoing were studied. Completion was timely in only three of the completed projects while all the ongoing projects were behind schedule. Most of the respondents indicated that the completion time of the projects was greatly influenced by the four

Factors and that these factors remain critical and continue to affect the completion time of the projects. This was also supported by the regression model which showed that the four independent variables accounted for 96% of the project's completion time. The research findings per the study objectives were as follows:

5.2.1 Influence of financing on the completion time of water projects

According to the findings, payments of the contractors' certificates were made on time in only 7.4% of the projects and that 55.6% of the contractors had financial difficulties although budgets in majority of the projects (66.7%) were adequate.All the respondents were of the opinion that completion time of the projects was greatly influenced by the time payments of contractors'

Certificates were made. This was also supported by the analysis which showed a moderate positive relationship ($r=0.432$) between financing and completion time of the projects

5.2.2 Influence of monitoring on the completion time of water projects

From the findings, the supervisor's ability to effectively supervise the projects was rated poor in 77.8% of the projects which was consistent with the findings that supervisory teams were inadequate in the same percentage of projects, and that actions on observed deviations in project targets were not taken on time in majority (66.7%) of the projects. 92.6% of the respondents indicated that monitoring had much influence on the completion time of the projects. The analysis showed a moderate positive relationship ($r=0.448$) between monitoring and the completion time of the projects.

5.2.3 Influence of contractor's capacity on the completion time of water projects

From the study findings, 92.6% of the contractors had executed more than 10 similar projects and that all had on average an experience of more than 10 years in the field of construction. This was confirmation that they had sufficient experience in construction management. Their ability to effectively plan and schedule project activities was however rated poor in 70.3% of the projects and most of them (89.6%) lacked sufficient equipment and personnel. All the 27 respondents were of the opinion that the contractors' capacity had a big influence on the completion time of the projects. This was supported by the analysis which showed a high positive relationship ($r=0.702$) between contractor's capacity and completion time of the projects

5.2.4 Influence of contract variations on the completion time of water projects

According to the research findings contract variations were indicated in 92.6% of the projects with unexpected ground conditions being rated the most frequent variation. 55.6% of the respondents were of the opinion that completion time of the projects was to a large extent influenced by contract variations. The bi-variety analysis showed a negative relationship ($r=-0.282$) between contract variations and completion time of the projects meaning that the more the variations the lower the probability of timely completion of the water projects would be.

5.3 Conclusions

From the above findings the researcher can conclude that: The level of financing of a project's construction activities and its timeliness determines its completion time. When project financing is adequate and timely, the project's contract schedule will be adhered to and hence its completion will be timely. The high percentage of contractors' financial difficulties observed in this study can be attributed to the high percentage of delayed payments of contractors' certificates, leading to the high percentage of delayed project completions of the water projects. Financing is thus a significant predictor of the completion time of water projects that has a strong positive relationship with timely completion of the projects. It is therefore important that the contractors and clients of the water projects make projects financing plans that are feasible to enable their adequate and timely funding.

Effective monitoring partially depends on adequacy of supervisory personnel and timeliness in making of decisions and taking of actions to alleviate significant project target deviations that exist. This was attested by the finding that the percentage of the projects in which monitoring was indicated as being poor was the same as that in which respondents felt supervision teams were inadequate. This by extension meant that decision making and action taking to alleviate deviations were not timely culminating to a big percentage of delayed completions of the water projects. There is therefore direct positive relationship between monitoring and timely completion of water projects.

Hence, it is important for WSPSs to reinforce monitoring of their projects to help identify factors affecting construction efforts of projects in order that they can be mitigated before they impact negatively on the project completion time. Contractors experience in the construction field is not a guarantee that they would successfully execute new projects. This was attested by the findings that though all the contractors had sufficient experience in executing other similar projects, there was a very high percentage of completion delay in the water projects. Contractor's incompetence that can be attributed to inadequate equipment and personnel with required skills as well as financial difficulties among others is a key factor contributing to time overruns in the water projects. Contractor's capacity is therefore a very significant predictor of timely completion of the water projects that has strong positive relationship with timely completion.

Contract variations occasioned by unpredicted physical conditions and /or necessary changes in scope occur in almost every implementation. Variations will conspire against the project and impact negatively on the project targets of time .This can explain the finding in this study that it was only in 7.4% of the projects that there were no variations, yet the percentage of completion delays among the projects was much higher. There is therefore a negative relationship between variations and timely completion of the water projects.

As a result, it is important that WSPSs make adequate initial arrangements for forecasting mechanisms to be included in the implementation plan to enable identification of any potential threats early enough so that appropriate action is taken to minimize their negative impact on the completion time of water projects.

5.4 Recommendations

In light of the key findings of this study, the following recommendations are proposed to address completion time of water projects in WSPSs:

(i) The organization should allow sufficient time to prepare project briefs and other feasibility studies and finance plan to avoid financial difficulty.

Contractor, of the project should ensure efficient time management through proper resource planning, duration estimation, and schedule development and control; to avoid delay

(ii) Monitoring is a factor that was positively influencing the completion time of the water projects as it provided the project implementers and other stakeholders of the projects with indications of the extent of progress and achievement of objectives and progress in the use of all allocated resources, helping them ensure that the projects were on track to completion by certain deadlines by comparing actual performance with planned performance and taking timely corrective action to yield desired outcomes when significant deviations existed. All WSBs should therefore adopt a comprehensive monitoring and reporting system that is result based to be adopted by all implementing agents to motivate implementers effectively supervise ongoing projects.

(iii) To ensure that contractors have the required capacity to deliver projects as per the initial schedules, WSBs should demand for prove of past successful executions of similar projects from contractors before procuring them. This is because contractor's capacity was found to be a very strong determinant of completion time of the water projects.

(iv) Since contract variations impacted negatively on the completion time of the water projects WASREB and WSBs should ensure that adequate forecasting mechanisms are included in the implementation plan to enable identification of any potential threats early enough so that appropriate action is taken to minimize their impact on the project.

WSPSs should therefore reinforce effective construction management practices that entail effective overall planning coordination and control of project activities from the beginning to the completion of the water projects.

As a result, it is important that WSPSs make adequate initial arrangements for forecasting mechanisms to be included in the implementation plan to enable identification of any potential threats early enough so that appropriate action is taken to minimize their negative impact on the completion time of water projects.

5.5 Suggestions for Further Research

(i) Further research should be conducted to establish other factors determining completion time of water projects in WSBs in Jimma zone since the four variables that were studied accounted for only 96% of variations in completion time of the water projects.

(ii) The study focused on factors involved in the construction phase of the projects. The scope of the study should be widened to include factors in the whole project cycle.

(iii) A study should be carried out on value for money for water projects in WSBs in Jimma zone in order to gauge whether the implementation of the water supply and sewerage projects use the available resources optimally, and to assess the projects' outcomes and impact.

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Appendices

Appendix A: Survey Questionnaire

JIMMA UNIVERSITY

SCHOOL OF GRADUATE STUDIES

M.A. IN PROJECT MANAGEMENT & FINANCE

Questionnaire to be Filled by Clients, Consultants, and Contractors

Dear Sir/ Madam,

I 'am a student at University of Jimma (JU), pursuing a Master of project management and finance (PM&F). I 'am undertaking a research project in partial fulfillment of the academic requirements. My study is on —:*the factors influencing the completion time ofwater projects. The study will be limited to JimmaZone with particular focus on water projects in Dedo and Kersaworeda.*

Your organization has been selected to form part of the study. I will be very grateful if you would spare sometime from your busy schedule, to respond to the questions listed on the attached questionnaire.

Your response will be treated with uttermost confidentiality. The findings of this research may be availed to you upon completion of the research if you so request.

Your assistance and co-operation will be highly appreciated.

Yours faithfully,

WassihunAbebe

JU, PM Student

Email: *wass.kochi94* [gmail.com](mailto:wass.kochi94@gmail.com)

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Appendix A: Survey Questionnaire

JIMMA UNIVERSITY
SCHOOL OF GRADUATE STUDIES
M.A. IN PROJECT MANAGEMENT & FINANCE
Questionnaire to Water Projects' implementation team leaders

The aim of this questionnaire is to gather information about the factors influencing the completion time of both completed and ongoing water supply projects undertaken by Jimma Zone water service within the last three years

This questionnaire is required to be filled with exact relevant facts as much as possible. All data included in this questionnaire will be used only for academic research and will be strictly confidential. After all questionnaires are collected and analyzed, interested participants of this study will be given feedback on the overall research results. Please respond to each question by adding a tick in the appropriate response or filling in the relevant information.

Name of project.....

Part A: General Information:

1. Respondent's Organization

- A) Client B) Consultant C) Contractor

2. Job title of the respondent:

- A) Project Engineer B) Site Engineer/ Agent C) Resident Engineer

3. Years of experience of the respondent: Years

4. Number of similar projects that you have executed

- A) 1 to 10 ----- B) 11 to 20 ----- C) 21 to 30 ----- D) More than 30 ----

Part B: Project’s Completion Time

5. What is the current status of the project? A) Complete ----- B) Ongoing-----

6. If complete; was the project completed as per the initial schedule?

A) Yes ----- B) No -----

7. If ongoing; is the project currently on schedule?

A) Yes ----- B) No-----

Please respond to the questions in part C to F with respect to the current status of the project; whether complete or ongoing. In a scale if 1-5, alongside each statements kindly indicate the extent to which you agreed where 1=Strongly agree 2= agree 3= Not sure 4= Disagree 5= Strongly Disagree

Part C: Financing of the project

<u>S/N</u>	<u>Statement</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>
8	The project budget is adequate for the project completion.					
9	Payments of contractor’s certificates made on time					
10	The contractor did not have financial difficulties.					
11	Timely payments of contractor’s certificates has influence on the project’s completion time					

In a scale if 1-5, alongside each statements kindly indicate the extent to which you agreed where 1=Strongly agree 2= agree 3= Not sure 4= Disagree 5= Strongly Disagree

PartD: Monitoring

<u>S/N</u>	<u>Statement</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>
12	The project’s supervision team was/ is adequate					
13	The project supervisors are/ were effectively supervise the project					
14	Supervision approvals and decisions made on time					
15	Actions to decisions made were / are taken on time					
16	The monitoring process have influence on the completion time / schedule of the project					

Part E: Contractor's Capacity

In a scale of 1-5, alongside each statement kindly indicate the extent to which you agreed where 1=Strongly agree 2= agree 3= Not sure 4= Disagree 5= Strongly Disagree

S/N	Statement	1	2	3	4	5
17	The contractor had / has adequate experience in undertaking similar projects					
18	The contractor's ability is /was interesting for effectively plan and schedule of project activities					
19	The contractor had / has sufficient equipment					
20	The contractor had / has enough personnel and of required skills					
21	The contractor's capacity highly influence the completion time/schedule of the project					

Part F: Contract variations

23. Which of the listed variations was/is the most influential on the completion time/ schedule of the project? Put a tick to indicate the extent to which you agree on a scale of 1 to 5 where 1=Strongly agree 2= Agree, 3= Not sure, 4=disagree, 5= Strongly disagree

S/N	Statement	1	2	3	4	5
22	Changes in scope\					
	Adverse weather					
	Unexpected ground condition					
23	The project has on variation.					
	The project has variation too many times					
	The project sometimes has variation.					
24	The frequency of variations are /were influence the completion time / schedule of the project					

Part G: On time Completion of Projects

. Which of the listed variations is /was on the completion time/ schedule of the project? Put a tick to indicate the extent to which you agree on a scale of 1 to 5 where 1=**Strongly agree** 2= **Agree**, 3=**Not sure**, 4=**disagree**, 5= **Strongly disagree**

S/N	Statement	1	2	3	4	5
25	The project is completed before the given schedule					
26	The project is completed on the given schedule					
27	The project is completed behind the schedule					

28. State other factors in order of importance that had / havehad significant influence on the completion time / schedule of the project.

29. Kindly give suggestions on how the project's completion time could be improved.
