ADDIS ABABA UNIVERSITY
COLLEGE OF BUSINESS AND ECONOMICS
SCHOOL OF COMMERCE
OFFICE OF GRADUATE STUDIES

Assessing the Project Time and Cost Management Practices: Case of UNICEF Ethiopia Supported Project

By
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January 2024

DECLARATION OF CANDIDATE

I hereby declare that this research entitled "Assessing the Project Time and Cost Management Practices: Case of UNICEF Ethiopia Supported Project" is my own work and that it has not been submitted anywhere for any approval.

Name: Tigist Admassu Bekele

Signature: _____

Date: _____

STATEMENT OF CERTIFICATION

This is to certify that Tigist Admassu has carried out this project work entitled "Assessing the Project Time and Cost Management Practices: Case of UNICEF Ethiopia Supported Project" under my supervision. This work is original in nature, and it is sufficient for submission as the partial fulfillment for the award degree in Masters of Art in Project Management.

Name of Advisor: Dr. Adane Atara

Signature: _____

Date: _____

ADDIS ABABA UNIVERSITY
SCHOOL OF COMMERCE
DEPARTMENT OF PROJECT MANAGEMENT

This is to certify that the project work entitled "Assessing the Project Time and Cost Management Practices: Case of UNICEF Ethiopia Supported Project" is prepared by Tigist Admassu and submitted in partial fulfilment of the requirements for the degree of Masters of Arts in project management complies with the regulation of the University and meets the accepted standards with respect to originality and quality.

Approved Board Committee:

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

Acknowledgment

First and foremost, all praise and thanks go to God the Almighty for making this possible for me.

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Acronyms

BCA - Basic Cooperation Agreement

CFO - Chief of Field Office

CSO - Civil Society Organizations

ERP – Enterprise Resource Planning

IPs – Implementing Partners

OXFAM - the Oxford Committee for Famine Relief

PERT - Project Evaluation and Review Technique

PM4DEV – Project Management for Development Organizations

PMI - Project Management institute

PMP - Project Management Professional

UNICEF – United Nations Children's Fund

WaSH - Water, Sanitation and Hygiene

WBS - Work Breakdown Structure

Abstract

The aim of this paper is to assess project time and cost management practices and their challenges, a case study on UNICEF supported multi-village rural water system rollout project, which was implemented by OXFAM. Descriptive research design with quantitative and qualitative approaches were adopted by this paper. Primary data were collected using a structured questionnaire from participants of the project in UNICEF and an open-ended interview was conducted with two supervisors of this project. Secondary data was obtained from desk review of official communications and progress reports about the project. Census survey method is used to collect primary data from the population of sixty. Frequency distribution tables were used to analyze the data, presenting it in percentages and mean supported by qualitative descriptions of the results. The study identified eleven time management practices, nine cost management practices and twelve common challenges to answer the research questions. Findings of the study showed that though there were some time and cost management practices implemented during the project lifecycle, most were either not effectively practiced or missing. These include lack of office policy or procedure to manage project schedules, absence of appropriate tools or techniques to do time and cost estimations and to develop schedules, identification of interactivity logical relationships which is hardly done, lack of regular monitoring of the project's time and cost performance, absence of timely allocating the appropriate physical resources to the project, and absence of a budget line for contingency to accommodate for risk or unforeseen costs. Challenges that were highly faced towards implementing efficient time and cost management practices included unpredictable external factors, project delay, price fluctuations, lack of relevant skills, change in scope and poor risk management strategies. The study concluded that the absence of the basic time and cost management practices, inefficient use of the existing ones coupled with the challenges faced had immensely contributed to the project's time and cost overrun. The UNICEF Ethiopia Country Office should work towards having a proper guidance in place for these practices and provide a well-crafted training to its program team. Further research on all sectors the agency is working on is suggested to be conducted to come up with a more comprehensive solution.

Key Words: Project Time Management, Project Cost Management, Time Overrun, Cost Overrun

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CHAPTER ONE
INTRODUCTION

1.1. Background of the Study

Project time and cost management are two of the basic knowledge areas in project management discipline that are expected to be employed while managing and executing projects to ensure their successful implementation.

Time management was originally considered to be of no significance beyond the commercial or work activities and, until recently, this focus has also been expanded to include personal activity. In practice, project time management is composed of a combination of processes, tools, techniques, and methods, which most of the processes are required in the planning phase of the project. (Hazar, 2014). These include definition and sequencing of activity, estimating the required resources an activity needs to be completed and the duration it will take to finish an activity. The actual project schedule can be built based on the output of these processes.

According to Arun & Srikumar, (2017), efficient time management involves the optimum investment of time in order to achieve suitable results from activities that are carried out within a defined period or timeframe.

Cost management, on the other hand, can be summarized as the process of estimating, allocating, and controlling costs that are related to a project, which calls for utilizing various kinds of tools and techniques under each process to ensure its efficient utilization. (Wrike, Inc., 2023).

Globally, around one-third of the projects undertaken (i.e., 33%) are completed on time and on budget. Only 2.5% of companies complete all of their projects as initially planned (Galiana, 2022). On time and on budget delivery of a project take up the weight of 19% and 18% respectively when considered out of seven criterions used to measure a project's success (Ibid.), which shows the attention that needs to be given to time and cost management practices when implementing a project.

Some of the most common issues that impact an effective project time and cost management include, but not limited to, are absence of a well-prepared project plan, poor/incorrect estimation of activities' durations and their costs, absence of monitoring and other relevant systems, lack of the right people with the right skills at the time of need, failing to identify the critical path early on and/or failing to monitor it, and having prolonged project meetings that waste time. (SkillMaker, 2017)

Various projects being implemented in Ethiopia are also no exception to this problem, despite existing principles and various tools and techniques to manage project time and cost are in place. Starting with the mega water and sanitation projects to the small-scale ones, the problem of completing such and other projects according to their plan is being faced in the country. This means that the projects face either a schedule overrun, or cost overrun or both.

A case study conducted on eleven water supply projects in Ethiopia depicted that only one of the projects was completed on time and on budget while another one project was completed on time but with a 3% cost overrun. Two projects were completed on budget but with a 37 and 39 more days than the initially planned timeline respectively (time overrun), while the remaining eight projects faced both time and cost overruns when completed. (Berihu et al., 2023).

This research is aimed towards finding out whether or not appropriate time and cost management practices were being used in managing the water supply project in the Somali Region and to suggest viable options and recommendations to address any challenges encountered and improve completion of projects as per their initial schedule and budget plans.

1.2. Background of the Organization

UNICEF has been mandated by the United Nations General Assembly to protect children's rights, meet their basic needs and help them reach their full potential. UNICEF works to provide special protection for the most disadvantaged children, including victims of war, disasters, extreme poverty, all forms of violence and exploitation, and people with disabilities. In coordination with United Nations partners and humanitarian agencies, UNICEF makes available its facilities for rapid response to its partners to relieve the suffering of children and those who provide their care.

In Ethiopia, its first office was established in 1958 in Addis Ababa and in 1963, it signed a formal Basic Cooperation Agreement (BCA) with the Government. Currently, the agency has over 400 staff members with its head office in Addis Ababa and eight Field Offices in the different regions.

The country office works to support national efforts to ensure the realization of the rights of children and women through improved child survival, development and protection. The Agency has established good relations with the Government of Ethiopia, bi-laterals, donors, development partners and civil society organizations.

To this end, UNICEF Ethiopia is engaged in partnerships with Government and Civil Society Organizations (CSOs) to support the implementation of different social initiatives and projects through providing technical and financial support as well as engaging in monitoring and evaluating of their progress. These projects are mapped under six sectors the country office is actively collaborating with the relevant stakeholders in the country. The sectors include Survival and Health, Social Policy and Evidence for Social Inclusion, Child Protection, Learning and Development, Nutrition, and Water, Sanitation and Hygiene (WaSH).

1.3. Statement of the Problem

Building partnerships with CSOs to carry out different types of projects is one of UNICEF's collaborating methods with these institutions to reach vulnerable children and women. Some projects get to be finalized on time and within cost. However, a significant proportion of projects which UNICEF is undertaking in collaboration with CSOs have either schedule delays and/or both schedule and cost overruns.

UNICEF Ethiopia had supported 92 projects to be implemented by CSOs during the years of 2018, 2019 and 2020. Out of these projects, only 22% of them were finalized utilizing their initially approved budget and within their scheduled timeline. The remaining 78% of the projects had either schedule overruns or both schedule and cost overruns as shown in the Figure 1 and Figure 2.

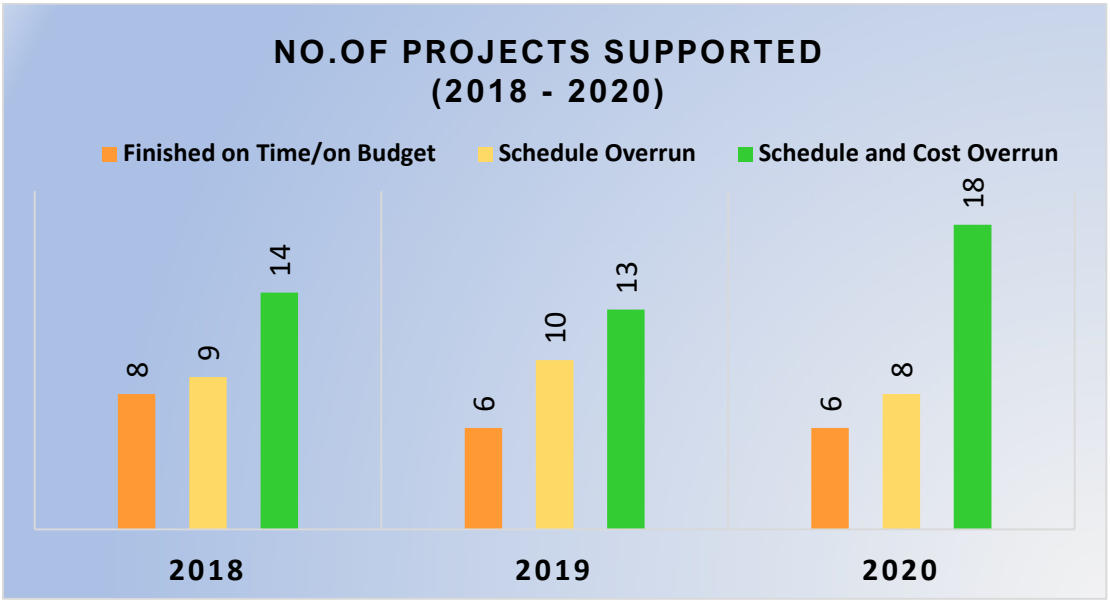

Figure 1. Nature of Projects Completion (2018 – 2020)
Source: CSO Projects Registry, UNICEF Ethiopia

The chart in Figure 1 shows the overall projects that were approved for funding during the three years period and how many of them were finished on time, finished but with schedule delays and those that had both schedule and cost overruns during their completion.

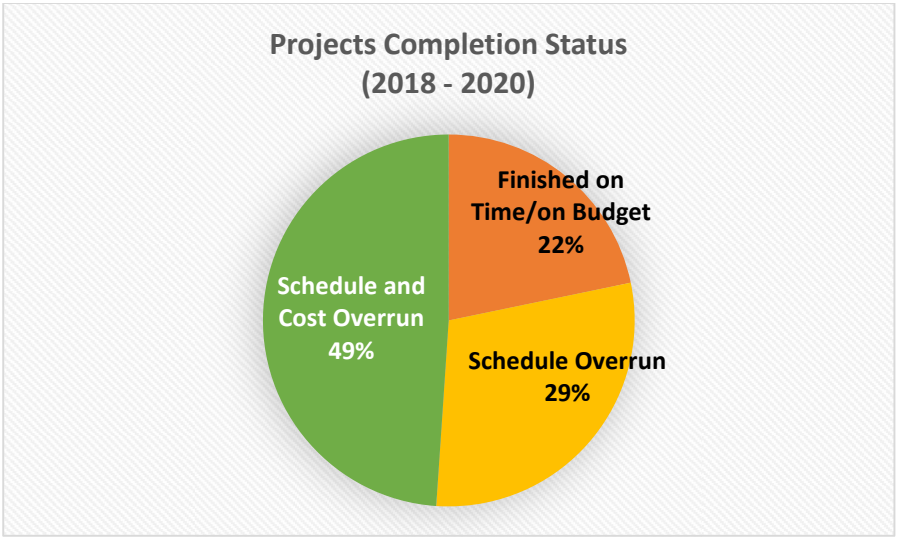

Figure 2. Projects Completion Status (2018 – 2020)
Source: CSO Projects Registry, UNICEF Ethiopia

Taking the presentations in Figures 1 and 2 as an indicative information on project time and cost management problem, one of the projects supported by UNICEF Ethiopia is selected as a case study for this project work. This project, entitled "*Rollout of Multi-village Water Supply Management Model and Promotion of Hygiene and Sanitation in Somali Region*", was managed under the WaSH sector, and was implemented by OXFAM. The project's main objective was to introduce and roll out an innovative way of managing large multi-village rural water management system as well as to promote hygiene and sanitation in selected three woredas of Siti Zone, Somali Regional State.

The project was a one-year project which started on 20 July 2018 and expected to end on 19 July 2019. However, the project had a 16-month delay and has ended on 31 December 2020. Regarding its budget, the initial total budget approved for the project was ETB20.3 million. By the time the project was closed, its total project budget had reached to ETB 29.1 million, which had increased by 43% compared to the initially approved budget over the course of its implementation.

1.4. Research Questions

1. What were the project time and cost management practices followed while managing the project under this study?
2. What were the challenges encountered in managing the project's time and cost related issues?
3. How can similar projects in future implement relevant project time and cost practices to minimize time and cost overruns?

1.5. Objective of the Study

Main Objective

The main objective of the study is to assess the project cost and time management practices and challenges encountered in UNICEF Ethiopia Country Office while managing the rural water management system project.

Specific Objectives

The specific objectives of this study are:

- To identify the project time and cost management practices employed by UNICEF Ethiopia while managing the rural water management system project.
- To identify the challenges encountered while carrying out the project cost and time management activities when managing the rural water management system project.
- To indicate any gap with respect to project time and cost management practices while handling the specific project under this study.
- To suggest areas of improvements for a better project time and cost management in future

1.6. Scope of the Study

This study has assessed the time and cost management practices exercised and challenges faced by UNICEF Ethiopia Country Office while managing the rural water management system project. The practices in the other project management areas are beyond the scope of this study. Only one project that was approved for funding during the year 2018 is considered for this study excluding other projects that were also approved the same year or prior and after the year 2018.

1.7. Limitation of the Study

This paper is limited to studying the time and cost management practices employed in managing only one project under WaSH Sector and the challenges encountered in doing so. Such practices may differ depending on the type of projects for other sectors, which is not disclosed in this paper.

1.8. Significance of the Study

This study will help identify the project time and cost management practices that were followed through when managing the rural water management system project to replicate best practices, if any and take lessons on missed areas for similar future projects.

This project work may also serve as a reference for similar future academic research.

1.9. Organization of the Paper

This project work has five sections which are divided into chapters. The first chapter is the introductory part which includes background information about the study and the organization in focus, statement of the problem, research objectives, research questions, significance of the study, and its scope and limitation. Chapter two focuses on review of various literatures that are related to the study area. References are made from books, journals, and online sources. Chapter three presents the research methodology. It includes the research design, source of data, population, and data collection techniques used. The fourth chapter discusses in depth the findings through analysis, presentations, and interpretation from the collected data. The last chapter provides summary of the findings, conclusion drawn based on the findings and recommendations given.

CHAPTER TWO
REVIEW OF RELATED LITERATURE

2.1. Introduction

This section of the paper reviews related theoretical and empirical literatures pertaining to project management practices giving emphasis on project time and cost management areas in relation to the focus of the study. The theoretical literature part explains relevant academic concepts on project time and cost management practices and anticipated challenges in implementing these practices. The empirical literature section focuses on actual research works conducted in areas related to this project work. The research gap section indicates lack of studies made explaining the area this paper is narrowing down to fill this gap. A conceptual framework is also developed at the end of this chapter based on the reviews to show the relationship between the time and cost management practices, the challenges faced and their outcome as a result of it.

2.2. Theoretical Literature

2.2.1. Definitions of Project Concepts

A project can be defined as "a complex, non-routine, one-time effort limited by time, budget, resources, and performance specifications designed to meet customer needs" (Gray, C.F. & Larson E.W., 2008: 10-11). According to Wysocki (2014), a project is a series of distinctive, complicated, and connected operations with a single objective that must be finished on schedule, on budget, and in accordance with specifications.

Siles, (2023) also defined a project as a clear set of activities with related inputs and outputs aimed to achieve objectives and goals linked to anticipated (desired) effects and impacts in a target population.

Projects must be managed, which means that they need to be planned, staffed, organized, monitored, controlled and evaluated. (Karwitha & Kihinji, 2019). According to D. Aničić, & J. Aničić, (2019), project management implies attaining the project's goal through balancing its scope, time and costs that arise during its implementation.

In related note, project management is “the application of a collection of tools and techniques (such as the Critical Path Method and matrix organization) to direct the use of various types of resources towards accomplishing a unique, complex, and one-time task within the planned schedule, cost and performance standards. Each task needs a specific combination of tools and techniques that are expected to match with the task environment, and life cycle (from starting to finishing) of the task.” (Olsen, 1971)

According to Barnes, (2011), project management is the application of processes, methods, skills, knowledge and experience so as to attain certain project objectives based on the agreed upon project acceptance criteria within the agreed boundaries. It can be linked with the processes of initiating, planning, executing, monitoring, controlling and closing phases of a project.

There are ten project management knowledge areas which are highlighted below with a brief description of what each area addresses, that are expected practices and actions when managing projects (PMI, 2000).

Figure 3. Project Management Knowledge Areas
Source: University College London, Translational Research Office

1. **Project Integration Management**: This practice addresses the steps necessary to make certain that the many components of one's project are well coordinated. It focuses on project planning, implementation and integrated change management.

2. **Project scope management** is the process essential to make certain that a project consists of the required work only that is necessary to successfully complete the project. It addresses initiation, planning, defining, verifying of scope and its change control.

3. **Project time management** offers with the strategies necessary to make certain that projects are finished on time. It deals with the definition, sequencing, duration estimation of activities, as well as the creation and management of schedule.

4. **Project Cost Management**: In an effort for a project to be finalized within the authorized budget, this process includes activities involving planning, estimating, budgeting, financing, funding, managing and controlling costs.

5. **Project quality management**: To be able to meet its stakeholders' expectations, a project's and its deliverables quality requirements must be met. Activities that help obtain this include incorporating the organization's quality directive regarding planning, managing and controlling of the set and agreed upon performance or quality standards.

6. **Project human resource management** is concerned with the procedures required to utilize the project's participants as effectively as possible. Planning, hiring, and team building at an organizational level are part of this process.

7. **Project Communications Management** deals with processes that are geared towards ensuring a project's information is generated timely and appropriately, collected, disseminated, stored and finally disposed after it served the purpose it was intended for. Activities to this end include planning of communication, information distribution, reporting on overall performance and closure.

8. **Project Stakeholders Management** deals with identifying the relevant groups of individuals and institutions that could affect or be affected by the project, studying and understanding stakeholders' expectations and their impact on the project, coming up with

suitable management strategies towards their effective engagement in the project decisions and execution. (Jainendrakumar, 2016)

9. **Project risk management** focuses on procedures for locating, evaluating, and addressing project risk. It deals with planning for risk management, identifying risks, analyzing them both qualitatively and quantitatively, planning for risk responses, and monitoring and controlling risks.

10. **Project Procurement Management** has its focus areas on processes required to purchase products and services from sources that are outside of the performing organization. The planning of procurement, solicitation, source selection, contract management, and contract closeout are activities carried out under this practice area.

2.2.2. Project Time Management

Oburu (2020), views time as a crucial component of project management, which includes abilities like goal-setting, planning, and prioritizing for an improved project performance. In order to maximize the limited time spent on tasks related to a given project, he further defined time management as the act of planning, scheduling, and exercising cognitive control over those activities expected to be carried out under a project.

Before obtaining a thorough schedule during the planning phase, project time management begins at the very beginning of launching the project by establishing the required project duration and its milestones (Hazar, 2014).

Project time management, according to PMI (2000), encompasses the procedures or techniques necessary to guarantee the timely completion of a project. It entails scheduling the management process, identifying the activities, sequencing the activities, calculating the time of the activities, developing the schedule, and controlling the schedule.

i. Plan Schedule Management

Plan schedule management is the process of developing the procedures, guidelines, and records necessary for the planning, development, management, execution, and control of the project schedule. The key benefit of this activity is that it provides guidelines and instructions for managing the project duration throughout the project's life. This process is only used once or in conjunction with particular project milestones (PMI, 2000). It makes use of inputs such as organizational process assets, the project management plan, the project charter, and enterprise environmental factors. The result is a schedule management plan which outlines the procedure to be utilized to help assure the timely completion of the project. It offers instructions on how the project schedule will be created, kept up with, and managed.

ii. Define Activities

The quantity of work done to translate input into the right output is referred to as activity in project management. In order to obtain the project's main and sub deliverables listed in the Work Breakdown Structure (WBS), it is necessary to determine the precise tasks that must be carried out (PMI, 2000). To estimate the time and resources needed to finish them, this must be done in enough depth. In order to properly define project activities, project managers employ inputs as well as a variety of tools and methodologies (Hussain, 2014).

iii. Activity Sequencing

This entails identifying and recording logical linkages between activities that include interaction. To later enable the construction of a realistic and achievable schedule, activities must be correctly sequenced. It can be carried out either manually or with the use of a computer (for instance, by utilizing project management software). Finalizing the connection of activities to complete the project scope and accomplish the task objectives is the primary motivation behind the sequencing of activities. (PMI, 2000)

iv. Activity Duration Estimating

Estimating activity durations is the process of using project scope and resource information to create durations that may be used as schedule input (PMI, 2000). The WBS and activity list

are used to define the activities, and this procedure determines how many work hours are required to finish each activity. Hours or days are typically used to describe work periods. Larger projects, however, might specify duration in weeks or months. The main advantage of this approach is that it indicates how long it will take to perform each activity. Throughout the project, this procedure is used.

Tools and technics of estimating activity duration consist of: (Dino, 2022)

- **Expert judgment**: When possible, expert judgment should be used, informed by previous data. The individual project team members may also offer information on duration estimates or suggested maximum activity durations from earlier projects with a similar scope

- **Analogous estimating**: This is the process of estimating the duration of a future schedule activity by starting with the actual duration of a current, comparable schedule activity.

- **Parametric estimating**: The amount of work to be completed multiplied by the productivity rate can be used to objectively derive the basis for estimating activity durations.

- **Three-Point estimating**: This entails taking into account the level of risk in the initial estimate, the accuracy of the activity time estimate can be increased. By taking the average of the three predicted durations, an activity duration estimate may be created. When there is uncertainty in the individual activity estimations, the Project Evaluation and Review Technique (PERT) is utilized to estimate the activity duration by applying a weighted average of optimistic, pessimistic, and most likely projections (PMP, 2012).

- **Reserve analysis**: To account for schedule risk, project teams may decide to add extra time known as contingency reserves, time reserves, or buffers to the overall project schedule. The contingency reserve might be calculated quantitatively or as a percentage of the anticipated activity duration.

v. Schedule Development:

The timetable outlines when each task is to be completed, what has already been done, and the order in which tasks must be completed (Hussain, 2014). According to PMI (2000), the start and end dates of project activities are determined as part of the schedule planning process. If the start and end dates of a project are not reasonably determined, it is doubtful that it will be completed as planned. Before establishing the project plan, this process frequently needs to be iterated (together with the processes that supply inputs, particularly length and cost estimating). (Ibid)

According to MindTools (2013), the major tools and techniques that are used to developing the schedule are:

1. **Schedule Network Analysis:** This shows the project's activities, the time required to execute them, and the order in which they must be completed graphically. These studies are often produced using project management software; popular formats include Gantt charts and PERT charts.

2. **Critical Path Analysis:** This method involves examining all of the required tasks and determining the "best line"—or critical path—to follow in order to finish the project as quickly as possible.

3. **Schedule Compression**: This tool reduces the amount of time allotted for specific operations, hence reducing the overall length of a project.

4. **Resource Optimization**: is the process of changing the start and end dates of activities to change the anticipated resource use to be equal to or less than the resource availability.

vi. Schedule Control:

To guarantee that modifications are agreed upon, schedule control focuses on influencing the variables that cause schedule changes, identifying when the schedule has changed, and managing the actual changes as they happen (PMI, 2000).

Schedule control, according to Dino (2022), is the process of keeping track of the project's progress in order to update the project schedule and manage modifications to the baseline schedule. The main advantages of this procedure include maintaining the timeline baseline throughout the project, measuring actual progress and regularly comparing it to projected progress, and taking rapid remedial action when necessary. Throughout the project, this procedure is used.

Schedule controlling involves four steps:

1. Examining the timetable to identify the areas that require improvement
2. Selecting a specific course of action for correction
3. Modifying the strategy to include the selected corrective action.
4. Adjusting the timeline to account for the effectiveness of the intended corrective actions

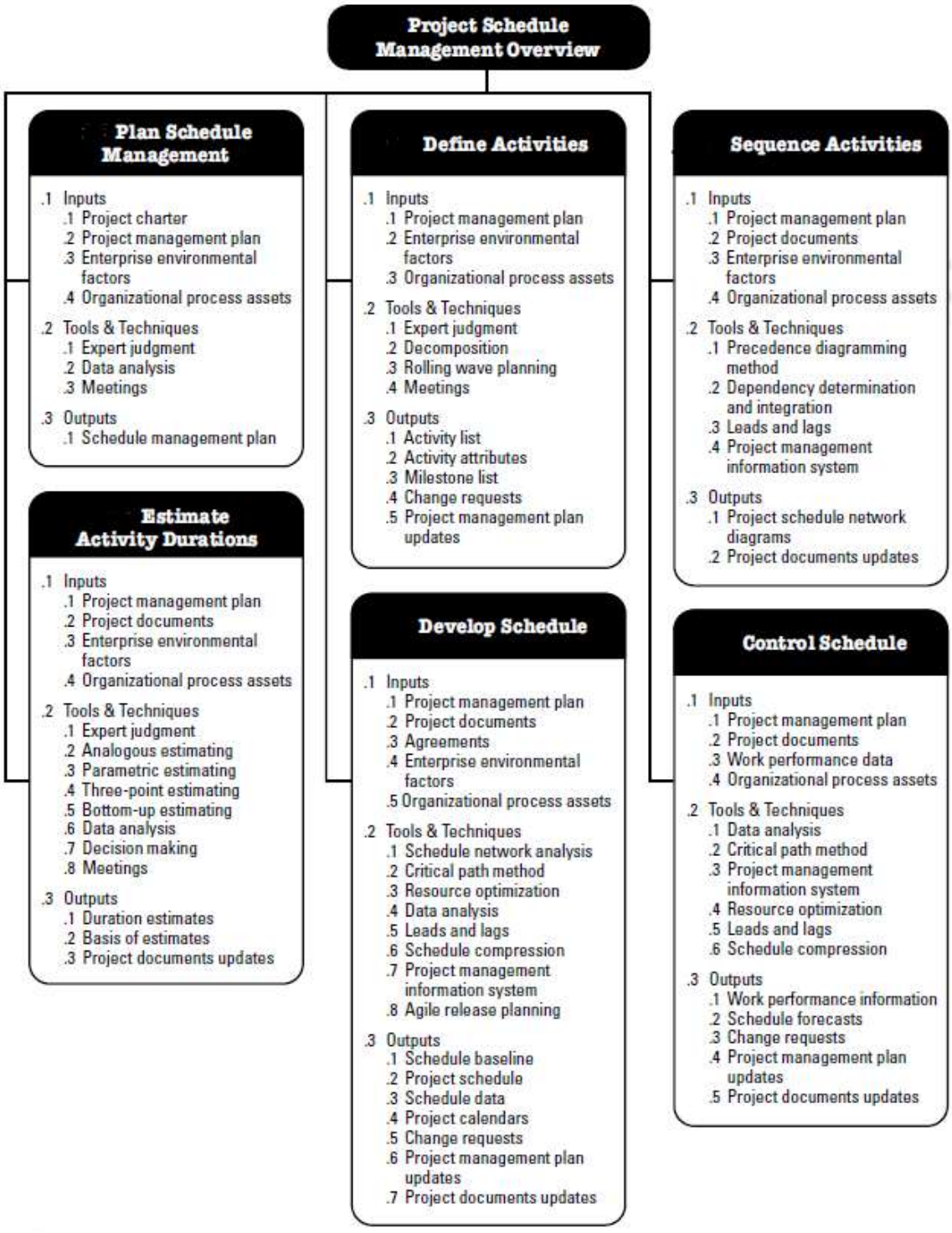

Figure 4. Project Time Management Overview
Source: Project Management Body of Knowledge (PMI, 2017)

2.2.3. Project Cost Management

Cost can be thought as the resource that is given up or spent in order to accomplish a particular objective (Hongren et al., 1994). Cost may also be described as the sum of money required to pay for, compensate for, or obtain a good or service. The sum of fixed and variable costs is the value or entire sum of money required to complete the work for a firm. (The Project Definition, 2023)

According to Jovanovic (2003), project expenses, are some of the fundamental elements of management and consist of the finances required for the project's realization. The total amount of money required to accomplish a project or piece of work, which includes both direct and indirect costs, is sometimes referred to as the project cost. Any expenses incurred or anticipated to be incurred, as well as financial commitments made or anticipated to be made, in order to finish the project are included in the project costs and are mentioned in the project baseline. (The Project Definition, 2023)

Project cost management involves four processes that are required to ensure a project is completed within the approved budget. These processes include resource planning, cost estimating, cost budgeting and cost controlling (PMI, 2000). These processes are shown in Figure 4 with their inputs to process the activities, the tools and techniques used during the period and the final outputs of the activities.

i. Resource Planning

Resource planning entails allocating the appropriate personnel to the appropriate projects at the appropriate times. It entails figuring out which physical resources (people, equipment, and materials), how much of each, and when they would be required to carry out project tasks (PMI, 2000).

According to an article on PlanView (2022), a resource plan identifies, organizes, and lists the resources required to complete a project. Resource planning is a strategic approach to ensuring resources are used in the most effective way, across a single project or a portfolio of work. It was further stated that when executed properly, organizations achieve maximum efficiency and optimization in their use of resources, without under or overutilizing any one resource.

ii. Cost Estimating

Cost estimating is the process of assembling and predicting costs of a project over its life cycle (Georgas, P. C. & Vallance, G. V., 1987). It involves developing an approximation or estimate of the costs of the resources needed to complete project activities through considering the causes of variation of the final estimate for purposes of better managing the project. (PMI, 2000). Stephen et al. (1994) stated that "estimating is the fundamental process of answering the question how much is the project expected to cost?"

The importance of cost estimation is stated by Akintoye (2000) in such a way that, "without an accurate cost estimate, nothing short of an act of God can be done to prevent a loss, regardless of management's competence, financial strength of the contractor, or know how".

Koeneke, (2023) also stressed the importance of accurate project cost estimation by stating that many costs can appear over the project management life cycle and an accurate project cost estimation method can be the difference between a successful plan and a failed one.

According to Adisa Olawale & Sun, (2010), cost estimation should be based on the project scope, the WBS and be connected to the project plan. To reach a correct estimation it is important that each activity is estimated based on the conditions of the execution of the specific activity. Since there are several factors that are uncertain in a project, a reserve cost can be assigned to activities with a low level of detailed information or work packages with potential high financial risks (quoted in Par Karlsson, 2011).

Methods for cost estimation:

A variety of estimating approaches can be employed to provide reliable estimates, allowing for varied degrees of accuracy. The following cost estimating methods are the most common (Eby, 2017):

- **Analogous Estimating**: Similar to expert opinion, comparable estimating, also known as top-down estimating or historical costing, bases estimates for prospective projects on data from completed projects in the past. When utilized to create estimates for comparable

projects and when the cost-influencing aspects can be carefully assessed by professionals, analogous estimating can be highly accurate.

- **Bottom-Up Estimating** is the most precise estimating method when a complete work breakdown structure is available. It is also known as analytical estimating.
- **Parametric Estimating**: This parametric estimating technique uses unit prices to get extremely precise estimates for projects that involve similar operations with high levels of repeatability.
- **Three-point Estimate**: This technique generates three scenarios: the most likely, the optimistic, and the pessimistic ranges. In order to develop a formula for reducing the cost, it takes into account the best-case, average, and worst-case possibilities. The estimator may even attempt to start with less accurate estimates and adjust after the project scope and deliverables are determined, even though a corporation always strives to produce the most precise estimate.
- **Expert opinion**: Order of magnitude and intermediate estimations are where this estimation technique is most frequently applied. Experts who are knowledgeable about how much previous projects of a comparable nature have cost perform expert judgment estimate.

iii. Cost budgeting

To create a cost baseline for gauging project performance, this entails allocating the overall cost projections to specific activities or work packages. (PMI, 2000).

In small projects, the project cost budgeting step may be incorporated into the project cost estimating phase (Owen et al., 2007). However, it is crucial to construct the project budget for big projects while including planning for contingencies and allowances. The authors have demonstrated two cost budgeting tools in order to properly build the budget: Contingency and Allowance Budgeting and Strategic Budgeting. These methods aim to make the budgeting process better. While efforts are made to develop and share a strategy for achieving improved estimates with all employees through contingency and allowance planning, the contingency

and allowance are important cost elements to accommodate for risk or unforeseen costs for appropriate establishment of the budget. Overlooking these cost components could impact proper project execution (Ibid).

iv. Cost Control

Cost control is the process of continuously collecting, compiling, evaluating, monitoring, reporting, and managing costs (PMI, 2000). It is involved with detecting that the cost baseline has changed, influencing the reasons that lead to changes in the cost baseline to ensure that changes are agreed upon, and managing the actual changes as they happen. Monitoring cost performance, ensuring that all appropriate changes are recorded, preventing incorrect, inappropriate, or unauthorized changes from being included in the cost baseline, notifying stakeholders of authorized changes, and taking action to keep expected costs within reasonable bounds are all activities involved in cost control (Ibid).

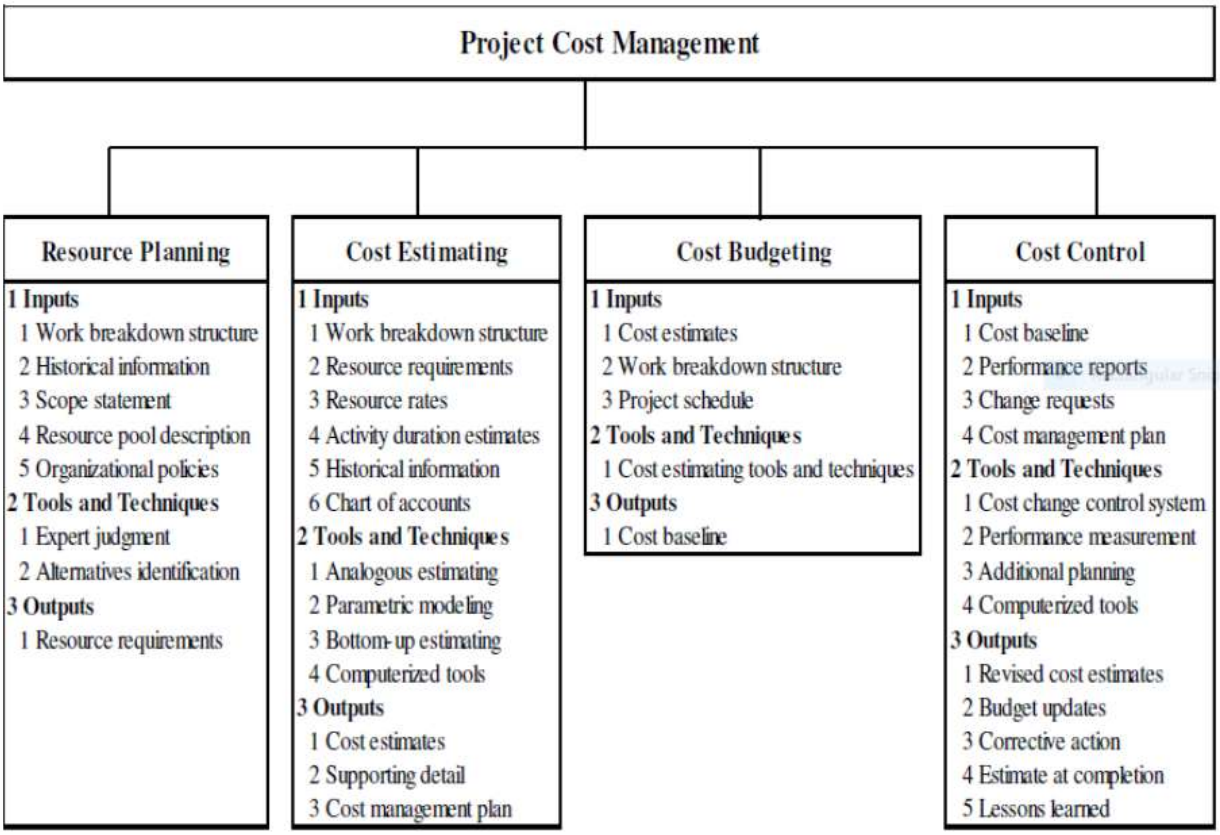

Figure 5. Project Cost Management Overview
Source: Project Management Body of Knowledge (PMI, 2013)

2.2.4. Challenges of Project Time and Cost Management

Project time and cost management areas are very important skills project managers and team members need to acquaint themselves with. There are challenges encountered affecting the effective time and cost management processes when managing projects.

PM4DEV, (2023) identified some of the challenges faced by development projects which include poor project planning, inadequate management skills, lack of relevant skills, lack of accountability, lack of stakeholder involvement, unrealistic plans, no measure to evaluate quality, poor and inconsistent project management discipline, duplication of efforts, poor risk management strategies and unmotivated project staff.

Elinwa & Joshua (2001) also identified some challenges to materialize an effective project time management, such as underestimation of time/duration for projects, mode of financing and payment for completed works, and improper planning.

An article from an online source (kissflow, 2022) also highlights challenges related to projects delays. These include changes in project scope, resources becoming unavailable, poorly planned project timeline, unrealistic project objectives and deliverables within the project constraint, lack of historical data, external vendors not delivering on time, ineffective communication between project stakeholders , unpredictable external changes like disasters. Multitasking, as indicated by Järrehult, (2012) is another challenge faced by project managers and their teams as it increases project time by over 60% and decreases efficiency by 30%.

2.3. Empirical Literature Review

According to Mahfouz (2019), World Bank had studied 1,627 projects worldwide between 1974 and 1988 and concluded that 90% of the projects related to construction sector were delivered late, while their cost also overruns up to 560% of their initially planned budget. He further indicated that 70% of the public projects in Kingdom of Saudi Arabia were delayed and there was a 110% time overrun of the contractual durations of these projects. The major challenges faced to end up in such time and cost overruns by these projects were identified as poor planning, scheduling, monitoring and controlling; shortage of administrative, technical, managerial or interpersonal skills; change in the scope or design of the project; and unrealistic contract duration.

Kostalova and Tetrevova (2014) indicated that 83% of the projects that were implemented in Czech Republic that were monitored under their study failed to meet the planned project timeline. In similar study, 70% of these projects had also failed to be completed within their planned project budget. The major challenges faced to complete these projects on time and budget were identified as insufficient qualified human resources, change in the projects scope, inaccurate project planning, poor requirements planning and insufficient budget.

Mansfield et al (1994) identified in their survey study the challenges faced that hindered an effective project cost management in Nigera. These include price fluctuation, inaccurate estimates, delay (time overrun), additional work, fraudulent practice and kickbacks, and non-adherence to agreement conditions.

A study in Ethiopia conducted by Dino (2022) on ERP projects indicated that most of EthioTelcom projects are not completed within a given schedule, budget and quality. Some of the challenges faced by these projects to be completed as per their plan are complexity of the project, lack of skilled manpower in project development and management, poor scope management, lack of ongoing analysis of the project performance, and integration issues raised in different projects.

Abubekir (2015), who focused on ten selected road construction projects in Addis Ababa, has identified that 100% of these road construction projects suffered both time and cost overrun. The rate of time overrun in these projects ranged from 25% to 264.38% of the contract duration, while the cost overrun ranged from 4.11% to 135.06% of the contract budget. The main challenges faced that contributed for the projects overrun were delay to start the projects (right of way problem), improper planning, inadequate supply of raw materials and equipment by contractors, design changes, and adversarial relations among stakeholders.

Mulu (2019) identified challenges to complete water and sewerage projects in Ethiopia as escalation of local material prices, ineffective project planning and scheduling, insufficient or inaccurate estimation of the projects duration and cost, bureaucracy in government agencies, and government tendering system of choosing the lowest bidder.

Abdi (2019) disclosed in his term paper that the Harar Water Supply Project had exhibited a significant delay from its initiation up to its completion. Challenges this project faced to be completed on time included frequent design changes, lack of close and regular supervision of the consultants, failure by the consultants to closely monitor the contracts, slow physical progress as result of failure to timely commence and complete physical activities, delays in finalizing the procurement process, and understaffing of the project team.

2.4. Research Gaps

Various pieces of research were conducted on project time and cost management practices and the challenges encountered in implementing these practices. Most of these bodies of research found were focused mainly on road and building construction projects with minimal data on water supply projects. Water supply projects also vary depending on their locations in urban and rural areas. Although few studies were found to have been conducted on urban water supply projects, very little or no research could be found on the rural water supply project with respect to the time and cost management practices employed in such projects and the challenges faced as such. Most studies on water supply projects, be it in urban or rural areas, tend to focus on ensuring their sustainability. Hence, this research paper will focus on identifying the project time and cost practices implemented in managing a rural water supply project and its challenges in doing so to fill this gap.

2.5. Conceptual Framework to Assess Project Time and Cost Management Practice

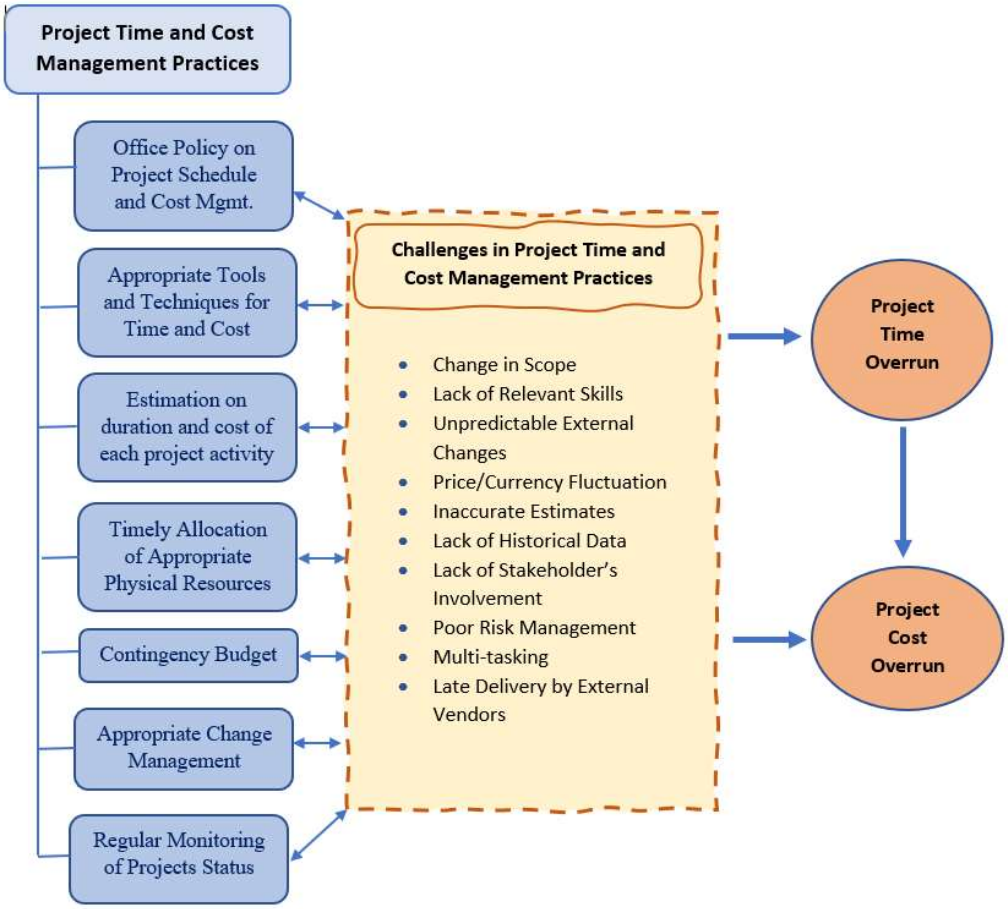

Figure 6. Conceptual Framework
Source: Developed by Researcher based on Literature Review, 2023

CHAPTER THREE
RESEARCH METHODOLOGY

3.1. Introduction

This chapter highlights the research design and approach used, sampling design utilized, sources of data, and the data analysis and interpretation methods used in the research. It also mentions the validity and reliability as well as ethical considerations taken into account when conducting the study.

3.2. Research Design

Descriptive research design was used to shade light into the time and cost management practices exercised when managing the multi-village rural water management system project and the challenges encountered in this regard.

3.3. Research Approach

Both qualitative and quantitative approaches were used for the collection and analysis of data.

3.4. Sample Design

In this research, the entire population of the study is sampled. The total target population of this study is 60 in number which includes the whole WaSH team in UNICEF Addis office (20), the project and support team in Somali Field Office (26), Finance/Operations team (6) as well as the PRC members (8).

As the population size for this study is relatively small in number, census survey is used for this research.

3.5. Sources of Data

Data was collected from both primary and secondary sources.

3.5.1. Primary Data Sources

The following primary data sources were used to collect required data:

a. Staff members who were involved in managing and supporting the project. These include WASH Officers and Specialists, Finance and Programme Associates who were supporting in managing the project budget.

b. Members from the Partnership Review Committee (PRC) who reviewed and approved the project

c. The WaSH Program Section Chief at Addis office and the Chief of Field Office (CFO) based in Jigjiga, Somali Region who were the supervisors of this project.

d. Support staff from other sectors in the Somali Field Office who had their fingerprints on this project.

A structured questionnaire and an open-ended interview were used to collect primary data from the potential respondents and identified interviewees.

3.5.2. Secondary Data Sources

Various official communications between UNICEF and OXFAM, progress reports, and revised workplans and budgets were reviewed to obtain the secondary data. Desk review of these documents was made to review factual secondary data.

3.6. Data Analysis and Interpretation

Quantitative analysis was made on the data collected through questionnaire and is presented using descriptive statistics method. Findings are discussed through frequency distribution tables and percentages with corresponding descriptions. Qualitative analysis was also done from the interview and review of the documents related to the project.

3.7. Validity and Reliability

Data triangulation was used in this study by using both primary and secondary sources and utilizing different data collection instruments (questionnaire, interview, and desk review of documents) in order to increase the validity and reliability of the results.

A pre-test was done on the questionnaire to test its reliability through a prior circulation to eight identified staff members (2 from Addis office WaSH team, 2 from Somali Field Office, 2 from Finance/Operations and 2 from PRC members) before being distributed to the population. To this end, Cronbach's Alpha has been utilized to assess the questionnaire's internal consistency. Cronbach's alpha is a value between 0 and 1, and the acceptable reliability has a positive value in between 1 and 0.7.

Table 3.1. Cronbach Alpha Value

Questionnaire	Cronbach's Alpha	No. of Items
Project Time Management Practices	0.711	11
Project Cost Management Practices	0.721	9
Challenges in Project Time and Cost Management	0.767	12

Source: Own survey (2023)

According to the values presented in Table 3.1, the value of individual variables range from minimum 0.711 to maximum value of 0.767. Hence, the researcher concluded that the questionnaire has internal consistency and is reliable to be used for further analysis.

3.8. Ethical Considerations

There was no physical or psychological harm caused to any participant of this project work. Those that were involved in this project work were informed of the purpose of this study to participate upon their own consent. Their anonymity is also protected, and there was no dishonest or misleading information included.

Any data used from secondary sources was cited and the questionnaire was prepared with full honesty in order to reach the goal of this study. Confidentiality of the participants is secured in the questionnaire filling process or any other data collection methods.

CHAPTER FOUR
DATA PRESENTATION, ANALYSIS AND INTERPRETATION

4.1. Introduction

This chapter focuses on the data presentation, its analysis, and interpretation pertaining to the objectives of the research.

The questionnaire developed has three sections: Part one focusing on the respondents' demography, part two on questions related to project time and cost management practices, and part three on challenges in project time and cost practices. The questionnaire's part two and three questions used a 1 to 5 Likert Scale, where (1) represents Strongly Disagree, (2) Disagree, (3) Neutral, (4) Agree and (5) Strongly Agree.

Qualitative analysis was also made from the feedback obtained during the interview sessions conducted and secondary data available from official communications and progress reports of the project.

4.2. Response Rate

The questionnaire was distributed to 60 potential respondents out of which 54 of them have responded, with 90% response rate. This rate is assumed to be an acceptable percentage to conduct studies through questionnaires. Interviews were also conducted with the WASH Program Section Chief and Chief of the Somali Field Office working in UNICEF Ethiopia.

4.3. Respondents' Demography

Table 4.1. Demography of Respondents

No.	Description		Respondent		Total	
			Frequency	%	N	%
1	Gender	Male	37	69%	54	100%
		Female	17	31%		
2	Age Distribution	Below 31	2	4%	54	100%
		32 - 42	16	30%		

No.	Description		Respondent		Total	
			Frequency	%	N	%
		43 - 55	29	54%		
		Above 55	7	13%		
3	Level of Education	Diploma	1	2%	54	100%
		First Degree	11	20%		
		MSc/MA	37	69%		
		Above MSc/MA	5	9%		
4	Relevant Work experience in the organization	0-5 years	18	33%	54	100%
		6-10 years	8	15%		
		11-15 years	16	30%		
		Above 15 years	12	22%		
5	Engagement in the Project under study	Less than 6 months	4	7%	54	100%
		6 months to 1 year	3	6%		
		1 year to 2 years	7	13%		
		More than 2 years	40	74%		
6	Job Level/ Category	Support Staff	15	28%	54	100%
		WASH Program Officer/Specialist	22	41%		
		Planning, Monitoring and Evaluation Officer/Specialist	4	7%		
		Finance	5	9%		
		Others	8	15%		

*n: is frequncy
Source: own survey (2023)

Out of the 54 respondents, 69% of them are male while the rest 31% of them are female.

Majority of the responders, i.e., 54% are between the age range of 43 – 55, 16% of them are between the ages of 32 – 42 leaving the rest 7% and 2% in the categories of Above 55 years of age and below 31 years respectively.

69% of the respondents have an educational background of master's level and 9% of them have above master's level. It was identified through a qualitative analysis that only 2 out of these categories have a background in project management. This validates the challenges identified in the theoretical review, i.e., inadequate management skills by the project team and in the empirical study, i.e., lack of skilled manpower in project development and management. The rest of the respondents' field of study included areas related to natural resource management, environmental

engineering, public health, environmental health, climate adaptation or mitigation, accounting, behavior change communication, etc.

Regarding relevant work experience of the respondents in the organization, over 52% of them have over 11 years of work experience in the organization while 33% and 15% fall in the categories of 0 - 5 years and 6 – 10 years. This shows that majority of the respondents has an institutional memory on the project under the study and the general project time and cost management practices of the office as well as the challenges encountered in this regard in the past.

Those who were engaged or involved in the project under this study account for 74% of the respondents, which helped to obtain a genuine and relevant data for this paper.

4.4. Assessing Project Time Management Practices

The time and cost management practices on the identified project for this study as well as the challenges faced were assessed using mean scores from the responses under Parts 2 and 3 of the questionnaire. The criteria suggested by Scott., (1999), regarding mean values is adopted for this study. His suggestion states that for studies conducted using a Likert scale ranging from 1 (Strongly Disagree/ Highly Dissatisfied) to 5 (Strongly Agree/Highly Satisfied), the interpretation to be given as: mean up to 2.8 is considered as Disagree, from 2.9 to 3.2 means neutral or neither disagree nor agree and mean above 3.2 is considered as an agree. Hence further interpretations will use these criteria on the respondents' data.

Table 4.2. Project Time Management Practices

Project Time Management Practices	Strongly Disagree (1)		Disagree (2)		Neutral (3)		Agree (4)		Strongly Agree (5)		Total		Mean
	n	%	n	%	n	%	n	%	n	%	n	%	
There is an office policy or procedure in place focusing on projects/program documents schedule management?	32	59%	20	37%	2	4%	0	0%	0	0%	54	100%	1.44
Identification of specific tasks that need to be performed in a project/program document is done.	20	37%	34	63%	0	0%	0	0%	0	0%	54	100%	1.63
Sufficient detailed information is included when identifying the specific tasks to be performed in a project/program document.	34	63%	13	24%	7	13%	0	0%	0	0%	54	100%	1.50
Interactivity logical relationships of activities is identified before estimating durations.	7	13%	33	61%	14	26%	0	0%	0	0%	54	100%	2.13
Sequencing of activities is done per their type of dependency.	0	0%	6	11%	14	26%	34	63%	0	0%	54	100%	3.52
Duration of each activity in a project/program document is estimated.	3	6%	5	9%	6	11%	29	54%	11	20%	54	100%	3.74
Appropriate tools and techniques for estimating duration have been provided by the office.	7	13%	27	50%	20	37%	0	0%	0	0%	54	100%	2.24
Determining the start and end dates of each activity in a project/program is done realistically.	34	63%	14	26%	6	11%	0	0%	0	0%	54	100%	1.48
Appropriate tools and techniques for schedule development have been provided by the office.	14	26%	12	22%	28	52%	0	0%	0	0%	54	100%	2.26
Status of projects/program documents is monitored on a regular basis.	13	24%	34	63%	7	13%	0	0%	0	0%	54	100%	1.89
Changes to the initial schedule of projects/program documents is formally agreed upon and documented.	0	0%	0	0%	14	26%	40	74%	0	0%	54	100%	3.74
Average													2.13

*n: is frequncy

Source: own survey (2023)

Under Table 4.2 where project time management practices were assessed, majority of the respondents disagreed to the statements that most of these practices were exercised while managing the project under the study, except for three areas that have mean values more than 3.2 and also above the overall average mean. These three areas include sequencing of activities per their type of dependency, which has a mean value of 3.52, duration estimation of each activity and documenting and formally agreeing on the changes that occurred in the initial schedule each with mean values of 3.74. This shows that the office is performing these three activities regarding time management practices as also stipulated in the theoretical literature review. However, the overall mean value of 2.13 for the various project time management practices which is less than the mean average of 2.8 for a Disagree scale level adopted for this study, indicates that most of the practices are not being exercised.

It can also be noted that provision of appropriate tools for estimating duration and schedule development may seem to be in place given their mean value is more than the overall average mean. However, based on the responses given to these two time-management practice areas, 63% of the respondents disagree (13% Strongly Disagree and 50% Disagree) to being provided with the appropriate tools and techniques to estimate durations, while 37% of them neither agree nor disagree. In related note, while 52% of the respondents neither agree nor disagree to being provided with the appropriate tools and techniques for schedule development, 48% of them were found to disagree (26% Strongly Disagree and 22% Disagree). During interview with the CFO and WaSH Program Section Chief, it was disclosed that the office usually uses historical data on similar past projects to do estimates. However, the project under study being an innovative one in nature which was yet to be rolled out, there was little or no information available to be used as such.

What had been disclosed under the theoretical review to have been good time management practices which are planning the schedule management through provision of office guidelines and instructions; defining of activities to be carried out; including sufficient detailed information when identifying specific tasks; identification of logical relationship of activities before estimating durations; utilization of appropriate tools and techniques for estimating durations and schedule

development; realistically determining the start and end dates of each activity and regularly monitoring the status of the project were found to be not practiced while managing this project.

4.5. Assessing Project Cost Management Practices

Table 4.3. Project Cost Management Practices

Project Cost Management Practices	Strongly Disagree (1)		Disagree (2)		Neutral (3)		Agree (4)		Strongly Agree (5)		Total		Mean
	n	%	n	%	n	%	n	%	n	%	n	%	
Appropriate physical resources (personnel, equipment, material) are allocated to the project at the appropriate times by clearly defining how much of each, and when they would be required.	0	0%	40	74%	14	26%	0	0%	0	0%	54	100%	2.26
Costs of the project resources that are needed to complete identified activities are estimated.	0	0%	0	0%	0	0%	41	76%	13	24%	54	100%	4.24
Appropriate tools and techniques for cost estimation have been provided by the office.	7	13%	33	61%	7	13%	7	13%	0	0%	54	100%	2.26
Estimated costs are allocated to each individual activity.	0	0%	0	0%	0	0%	34	63%	20	37%	54	100%	4.37
Contingency budget is included in the cost estimates to accommodate for risk or unforeseen costs.	12	22%	27	50%	10	19%	5	9%	0	0%	54	100%	2.15
Cost performance of the project is gathered, analyzed, monitored, reported and managed on an ongoing basis.	11	20%	24	44%	10	19%	9	17%	0	0%	54	100%	2.31
Changes to the cost baseline are recorded, properly documented.	0	0%	14	26%	7	13%	27	50%	6	11%	54	100%	3.46
Changes made on the project cost was communicated with the relevant stakeholder(s).	0	0%	7	13%	14	26%	14	26%	19	35%	54	100%	3.83
Efforts were made to bring expected costs within acceptable limits.	0	0%	12	22%	8	15%	26	48%	8	15%	54	100%	3.56
Average													2.77

*n: is frequncy

Source: own survey (2023)

Among the project cost management practices indicated under the theoretical review section, most of them (with mean values more than the overall average mean of 2.77) as depicted on Table 4.3, were being exercised while managing the multi-village rural water supply project. The ones that were not practiced, whose mean values are less than the overall mean average value include allocation of the required resources (personnel, equipment, material) as and when needed, provision of appropriate tools and techniques for cost estimation, inclusion of contingency budget in the project cost, and gathering, analyzing and monitoring of the project's cost performance on a regular basis.

Similar information was obtained from the review of OXFAM's progress report which stated that the CSO was not able to get the right candidates to fill the key staff positions for the rural public utility service model to start the work on time. As mentioned under the previous section, per the interview held with the CFO and WaSH Section Chief, appropriate tools and techniques were not provided to do cost estimates given the office often uses historical data for similar projects whereas the multi-village rural water supply project being a new initiative, made it difficult to use this technique for the cost estimate. The other information obtained from the interview was that the office has no room to budget for contingency as a procedure, and any budget line must be associated with a proposed activity of the project.

Monitoring of the cost performance of the project was also done by the program team only after the CSO submits progress and financial reports, as per the response obtained from the interview sessions.

4.6. Assessing Challenges of Project Time and Cost Management Practices

Table 4.4. Challenges of Project Time and Cost Management

Challenges Encountered in Time and Cost Management	Strongly Disagree (1)		Disagree (2)		Neutral (3)		Agree (4)		Strongly Agree (5)		Total		Mean
	n	%	n	%	n	%	n	%	n	%	n	%	
Change in scope (additional targets, work, etc)	0	0%	0	0%	8	15%	18	33%	28	52%	54	100%	4.37
Lack of historical data (to do estimates)	0	0%	0	0%	18	33%	14	26%	22	41%	54	100%	4.07
Lack of relevant skills	0	0%	0	0%	5	9%	21	39%	28	52%	54	100%	4.43

Challenges Encountered in Time and Cost Management	Strongly Disagree (1)		Disagree (2)		Neutral (3)		Agree (4)		Strongly Agree (5)		Total		Mean
	n	%	n	%	n	%	n	%	n	%	n	%	
Lack of stakeholders' involvement	0	0%	0	0%	27	50%	25	46%	2	4%	54	100%	3.54
Unpredictable external factors like disasters or conflicts	0	0%	0	0%	0	0%	12	22%	42	78%	54	100%	4.78
Poor risk management strategies	0	0%	0	0%	6	11%	24	44%	24	44%	54	100%	4.33
Delay (time overrun)	0	0%	0	0%	0	0%	15	28%	39	72%	54	100%	4.72
Price/currency fluctuation	0	0%	0	0%	7	13%	7	13%	40	74%	54	100%	4.61
Inaccurate estimation of cost/project budget	0	0%	0	0%	7	13%	40	74%	7	13%	54	100%	4.00
Inaccurate estimation of time/duration for projects	0	0%	0	0%	7	13%	40	74%	7	13%	54	100%	4.00
Multi-Tasking of project team	0	0%	0	0%	11	20%	18	33%	25	46%	54	100%	4.26
External vendors not delivering on time	0	0%	0	0%	3	6%	40	74%	11	20%	54	100%	4.15
Average													4.27

*n: is frequncy

Source: own survey (2023)

Table 4.4 clearly indicates that almost all the responders have agreed that the captioned challenges in the list, which are also included both in the theoretical and literature review sections, are encountered when practicing project time and cost management activities in managing the multi-village rural water supply project. The most trying challenges in managing the multi-village rural water system project which have mean value of over the overall average mean in order of rank are unpredictable external factors, delay (time overrun) of the project, price/currency fluctuation, lack of relevant skills, change in scope and poor risk management strategies. Results obtained from review of secondary data and interview also support this as discussed below.

One of the many reasons indicated in the official communications by OXFAM for the delay of the project was the CSO's inability for the first several months, to find suitable key staff to manage the rural public utility service model, which halted the project from starting. Another reason mentioned in these documents was that as the project being new in its nature, more time than anticipated was needed for the awareness, familiarization, and capacity building activities to both OXFAM staff as well as the regional bureau officials. These all relate to lack of relevant skill to

implement the project as one of the challenges, which contributed to the time overrun faced by the project.

OXFAM requested for an eleven-month extension of the project for reasons related to unpredictable external factor where there was a security concern in the identified project area due to conflict along the borders of the Oromia and Somali regions. Another six-month time extension was again requested by the CSO on their letter dated 17 June 2020, mainly for reasons associated with delivery of construction materials for latrines; inability to mobilize professional and semi-professional workers due to COVID-19, and lack of cooperation and involvement from the kebele officials.

In an informal probing with the Somali FO WaSH Specialist to see what measures were considered in light of the conflict in the area which was ongoing during the project's approval timing, it was learnt that the team was aware of the conflict but did not expect it to escalate to the magnitude it did since similar conflicts between pastoralists and farmer communities along the border area in the past used to erupt and cool off in different occasions. This can relate to poor risk management strategy, where startup of the project timing could have been formally agreed upon at a later date to avoid the delay caused as a result of the security concern in the area.

After the conflict in the area was under control, estimated costs for latrine construction, labor cost, monthly payment rate for the key staff who were expected to manage the rural public utility service model and other associated costs have increased drastically when the project was progressing from there, according to the communication between UNICEF and OXFAM and the later agreed upon program amendment document. Though prices of construction materials for latrines and related items as well as professional payment rates have increased over the course of the project implementation, it was also found out from the interview session with the CFO and WaSH Section Chief, that the project team had no or very little reference related to similar project work conducted in the past to carry out project time and cost estimates. This also contributed to the inaccurate cost and duration estimates, which is one of the challenges the respondents agreed to.

Accommodating these changes, the project amendment also included and agreed upon to add additional two woredas to be part of the project on top of the initially proposed three woredas as per the request made by the Regional Water Bureau to introduce the intervention to the wider Siti

Zone. These changes, which can be attributed to change in scope together with the prior inaccurate estimations and subsequent project cost increments mentioned above, had resulted in an increase in the project budget from the initially approved Birr 20.3 million to Birr 29.1 million.

Multi-tasking was also identified as one of the challenges in the empirical literature review section, which is also agreed by the respondents being faced by the project team. This was also evidenced during the interview that a WASH Officer/Specialist in Addis office is expected to follow up WASH projects being implemented by different implementing partners (IPs) – both Government and CSOs - in the different regions including the ones in the Somali Region. Similarly, a staff at the Somali Field Office with similar responsibility is expected to follow up on such projects implemented by different IPs in different project locations (woredas, zone) after they get management approval.

CHAPTER FIVE
SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1. Summary of Findings

This paper has a 90% respondent rate. 60 questionnaires were distributed to the population and obtained 54 of them. According to the responses obtained from questionnaire respondents, the interview held with the WaSH Program Section Chief and Chief of the Somali Field Office as well as from the review of existing documents about the project, the following are the findings obtained based on the data analysis conducted.

The average mean value for assessing project time management practices is 2.13, which is less than the mean average of 2.8 for a Disagree scale level adopted for this study. This indicates that the respondents to this section of the questionnaire believe that most of the project time management practices were not being exercised.

The average mean value for assessing project cost management practices is 2.77, which is again less than the mean average of 2.8 for a Disagree scale level adopted for this study. This also indicates that the respondents to this section of the questionnaire believe that most of the project cost management practices were not being exercised.

Identification of the interactivity logical relationships of activities before estimating durations with 2.13 mean value and provision of appropriate tools and technics based on similar past projects for duration estimations with mean value of 2.24 and cost estimations with mean value of 2.26 were somewhat exercised but not to the extent and manner they should have been.

Practices that were not implemented or available for use include lack of office policy or procedure that can guide program team to manage projects schedules with mean value of 1.44; availability of suggested tools or techniques to estimate project durations with mean value of 2.24 and that of costs with mean value of 2.26; identification of interactivity logical relationships with mean value of 2.13; monitoring of the project's time and cost performance on a regular basis with mean value of 1.89; allocation of appropriate physical resources (personnel, equipment, material) to the project

with mean value of 2.26; and availability of a budget line for contingency having a mean value of 2.15.

The average mean value of challenges faced in time and cost management practices is 4.27, where almost all the respondents indicated that the anticipated challenges identified in the theoretical and empirical literature review have been encountered by the project team and the CSO. The most trying challenges include change in scope, lack of relevant skills, unpredictable external factors, poor risk management strategies, schedule delay (time overrun), and price/currency fluctuation. Lack of stakeholders' involvement which occurred at the project site with kebele officials, inaccurate estimation of time and cost, external vendors not delivering on time as well as multi-tasking of the UNICEF project team were also the other challenges faced by the project team and the CSO.

5.2. Conclusion

Based on the above findings, the project team that managed the multi-village rural water system project demonstrated to have used some of the anticipated project time and cost management practices, which minimized the already occurred time and cost overrun.

However, critical time and cost management practices that were not carried out had resulted in an unnecessary and avoidable delay in the project schedule, which was extended by 16 more months for an originally a 12-month planned project, and a cost overrun which resulted in 43% project cost increment on the originally planned budget of ETB 20.3 million, finally totaling ETB 29.1 million when the project was closed.

Lack of office policy or procedure on managing project schedules as well as absence of appropriate tools or techniques to do time and cost estimations show the low level of priority given to these practices by the office exposing it to incur unnecessary additional costs both in terms of time and money. Same is true when interactivity logical relationships of project activities are not identified properly which created a very disorganized and ineffective schedule management of the project.

Absence of alternative and suitable tools and techniques that can be adopted for different scenarios and contexts to estimate project time and cost was one of the reasons for inaccurate estimations.

Allocation of appropriate physical resources (personnel, equipment, material) to the project were not readily available after the project was signed. Additionally, the cost and schedule performances of the project were not monitored on a regular basis. These all led to an inefficient project management where the rural water supply project is concerned.

From both the questionnaire and interview results, contingency budget is not allowed by the office procedure to be included as part of the project cost. This hinders realization of the general principle this budget is aimed for, i.e., to accommodate for risk or unforeseen costs, even though the cost overrun faced by this project is not expected to be covered by a contingency.

Major challenges that were encountered to the time and cost practices by the project team had resulted in an evident time and cost overrun of the project under study.

5.3. Recommendation

The following possible recommendations are given with the aim of strengthening and improving the project time and cost management practices and adopting measures to address the challenges encountered to avoid or minimize to the extent possible time and cost overruns faced by projects to be implemented by CSOs.

- The office should develop a policy or procedure or system that can be used to manage project schedules, introduce different but appropriate tools or techniques for time and cost estimations that can be used by the program team depending on the type of project at hand and the context and provide an orientation session on these. Standard costs appropriate to the programming context can also be defined to encourage consistent budgeting in related exercise.

- Assessment of CSOs capacities must be accurate/frank, which is one of the critical pre-requisites for any implementation to be completed timely, on budget and meeting the required standards/specifications. In this exercise, the program team should be proactive enough to enquire about the level of readiness of the CSO(s) to make ready and avail

required physical resources (personnel, equipment, or material) when needed with the required quantity and quality at the required time before taking up an intervention.

- The project team should be conducting regular project reviews with the CSOs to identify and address emerging challenges in a timely manner to mitigate challenges related to time and cost overrun.

- The office should give a room for contingency budget with a clear guidance on its proposed use to avoid or minimize its possible misuse.

- Organize a pre-budget meeting with CSO partners to have the same level of understanding about budget preparation, to maintain the economy, efficacy, and effectiveness of the resource during which the Finance unit team can join the meeting to support the process.

- The office should have a rigorous risk mitigation measure in place depending on the situation at hand and the type of project being managed, as different scenarios call for different risk mitigation measures.

- A well-crafted and need-based training on the above areas and regular refreshers should be organized by the office to equip the program team with the required and missing project time and cost management practices which are also expected to address and lessen those challenges being faced as a result of lack of these skills.

- The office management to explore ways to systematically mainstream management of such projects by the program team to be done with focus to lessen the challenge of multi-tasking.

5.4. Further Research

This study has focused on one project that was selected from only one of the Sectors UNICEF Ethiopia is working on. Similar study can be done from the remaining five sectors to further be able to address the project time and cost management aspects in the agency at an institution level.

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Appendix A. Questionnaire

Questionnaire
On Assessment of Project Time and Cost Management Practices and Challenges
(To be filled by UNICEF Staff)

Dear Participants:

My name is Tigist Admassu. I am conducting a project work entitled "Assessment of Project Time and Cost Management Practices, Case of UNICEF Ethiopia Supported Project" for partial fulfillment of my M.A. in Project management at AAU. The project selected for this study is entitled "*Rollout of Multi-village Water Supply Management Model and Promotion of Hygiene and Sanitation in Somali Region",* which was implemented by OXFAM and overseen by the WaSH team in the office.

The main purpose of this questionnaire is to collect relevant data for the above-mentioned project work from the staff members who participated in managing the captioned project. The information you provide will be used only for the academic purpose and will be kept strictly confidential. Appreciating your willingness, time and cooperation, you are kindly requested to fill the questionnaire carefully and responsibly based on your experience and knowledge since the outcome of this study will highly depend on your response.

Thank you and best regards,
Tigist Admassu
E-mail: tadmassu2000@yahoo.com; tadmassu@unicef.org

Instructions
1. Please, answer all questions.
2. In all cases where answer options are available, tick (√) inside the given box.

Part 1: Demographic Profile of Respondents

Please indicate your appropriate choice among the options provided by ticking (√) that best represents you.

1.Gender
☐ Male ☐ Female

2.Age
☐ Below 31 ☐ 32 – 42 ☐ 43 – 55 ☐ Above 55

3. Level of Education

☐ Diploma ☐ First Degree ☐ M.Sc./MA ☐ Above

4. Relevant work experience in the organization

☐ 0- 5 years ☐ 6-10 years ☐ 11-15 years ☐ Above 15 years

5. Your engagement in the *Multi-village Water Supply Management Model Project implementation*

☐ Less than 6 months ☐ 6 months to 1 year

☐ 1 year to 2-year ☐ more than 2 years

6. What is your job level/category?

☐ Support staff ☐ WaSH Program Officer/Specialist

☐ Finance ☐ Planning, Monitoring and Evaluation Officer/Specialist

☐ Other

Part 2. Time and Cost Management Practices on "Rollout of Multi-village Water Supply Management Model and Promotion of Hygiene and Sanitation in Somali Region" project

Instruction:

Please indicate how much you agree or disagree with the following statements concerning time and cost management practice in case of the captioned project. Please Tick (√) where appropriate in the space provided for each question.

No.	Description	Scale				
		1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree
Questions related to Project Time Management						
1	There is an office policy or procedure in place focusing on projects/program documents schedule management?	☐	☐	☐	☐	☐
2	Identification of specific tasks that need to be performed in a project/program document is done.	☐	☐	☐	☐	☐
3	Sufficient detailed information is included when identifying the specific tasks to be performed in a project/program document.	☐	☐	☐	☐	☐
4	Interactivity logical relationships of activities is identified before estimating durations.	☐	☐	☐	☐	☐
5	Sequencing of activities is done per their type of dependency.	☐	☐	☐	☐	☐
6	Duration of each activity in a project/program document is estimated.	☐	☐	☐	☐	☐
7	Appropriate tools and techniques for estimating duration have been provided by the office.	☐	☐	☐	☐	☐
8	The start and finish dates of each activity in a project/program document are determined.	☐	☐	☐	☐	☐
9	Appropriate tools and techniques for schedule development have been provided by the office.	☐	☐	☐	☐	☐
10	Status of projects/program documents is monitored on a regular basis.	☐	☐	☐	☐	☐

No.	Description	Scale				
		1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree
11	Changes to the initial schedule of projects/program documents is formally agreed upon and documented.	☐	☐	☐	☐	☐
Questions related to Project Cost Management						
1	Appropriate physical resources (personnel, equipment, material) are allocated to the project at the appropriate times by clearly defining how much of each, and when they would be required.	☐	☐	☐	☐	☐
2	Costs of the project resources that are needed to complete identified activities are estimated.	☐	☐	☐	☐	☐
3	Appropriate tools and techniques for cost estimation have been provided by the office.	☐	☐	☐	☐	☐
4	Estimated costs are allocated to each individual activity.	☐	☐	☐	☐	☐
5	Contingency budget is included in the cost estimates to accommodate for risk or unforeseen costs.	☐	☐	☐	☐	☐
6	Cost performance of the project is gathered, analyzed, monitored, reported and managed on an ongoing basis.	☐	☐	☐	☐	☐
7	Changes to the cost baseline are recorded, properly documented.	☐	☐	☐	☐	☐
8	Changes made on the project cost was communicated with the relevant stakeholder(s).	☐	☐	☐	☐	☐
9	Efforts were made to bring expected costs within acceptable limits.	☐	☐	☐	☐	☐

Part 3. Challenges of Project Time and Cost Management

No.	Questions	Scale				
		1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree
Question related to Challenges of Project Time and Cost Management						
	The following were the challenges encountered while managing the project's time/duration					
1	Change in scope (additional targets, work, etc)	☐	☐	☐	☐	☐
2	Lack of historical data (to do estimates)	☐	☐	☐	☐	☐
3	Lack of relevant skills	☐	☐	☐	☐	☐
4	Lack of stakeholders' involvement	☐	☐	☐	☐	☐
5	Unpredictable external factors like disasters or conflicts	☐	☐	☐	☐	☐
6	Poor risk management strategies	☐	☐	☐	☐	☐
7	Delay (time overrun)	☐	☐	☐	☐	☐
8	Price/currency fluctuation	☐	☐	☐	☐	☐
9	Inaccurate estimation of cost/project budget	☐	☐	☐	☐	☐

No.	Questions	Scale				
		1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree
10	Inaccurate estimation of time/duration for projects	☐	☐	☐	☐	☐
11	Multi-tasking of project team	☐	☐	☐	☐	☐
12	External vendors not delivering on time	☐	☐	☐	☐	☐

Thank you for your time!

Appendix B. Interview Questions

(WASH Program Section Chief and Chief of Somali Field Office)

1. What major elements are examined or reviewed before approving a project to be implemented by CSOs?

2. Are appropriate tools and techniques provided by the office to do time and cost estimates and schedule development?

3. Is there a provision to reserve for contingency for both time and cost estimates?

4. How many CSO projects, on the average, a particular WaSH Officer/Specialist in UNICEF manages?

5. How was the time and cost performance of the project followed up?