ST. MARY'S UNIVERSITY

SCHOOL OF GRADUATE STUDIES

MASTERS OF BUSINESS ADMINISTRATION IN PROJECT MANAGEMENT

ASSESSMENT OF QUALITY MANAGEMENT PRACTICES OF HOSPITAL CONSTRUCTION PROJECTS IN OROMIA

BY

ANANE MIRESSA

June, 2017

ADDIS ABABA, ETHIOPIA

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A THESIS SUBMITTED TO ST. MARY'S UNIVERSITY, SCHOOL OF GRADUATE STUDIESIN PARTIAL FULFILMENT OF THE REQUIRMENTS FOR THE DEGREE OF MASTER OF BUSINESS ADMINISTRATION IN PROJECT MANAGEMENT

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APPROVED BY BOARD OF EXAMINERS

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Dean, Graduate Studies	**Signature**
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Advisor	**Signature**
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External Examiner	**Signature**
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Internal Examiner	**Signature**

DECLARATION

I, the undersigned, declare that this thesis is my original work; prepared under the guidance of Dr. Worku Mekonin. All sources of materials used for the thesis have been duly acknowledged. I further confirm that the thesis has not been submitted either in part or in full to any other higher learning institution for the purpose of earning any degree.

Name

Anane Miressa Signature

St. Mary's University, Addis Ababa June, 2017

ENDORSEMENT

This thesis has been submitted to St. Mary's University, School of Graduate Studies for examination with my approval as a university advisor.

Worku Mokenin (Ph.D.) ----------

Advisor Signature

St. Mary's University June, 2017

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List of Abbreviations and Acronyms

EBCS	Ethiopian Building Code Standard
ORHB	Oromia Regional Health Bureau
OUCB	Oromia Regional Urban and Construction Bureau
PDCA	Plan-Do-Check-Act
PMBOK	Project Management Body of Knowledge
PMI	Project Management Institute
PMC	project management consultancy
QMS	Quality Management System
SPSS	Statistical Package for Social Sciences
STP	Health sector transformation program
TQM	Total quality management

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Abstract

This research was mainly set out with general purpose of the research to assess the quality management practices and major quality management challenges in hospital construction projects in Oromia. To achieve its objective, the study employed descriptive research and both primary and secondary data were used. Questionnaires, interview, and document review were, therefore, used as data collection tools. Furthermore, it employed purposive sampling techniques. The survey questionnaire was designed based on the literature and on the information collected through the document review of the project. The survey questionnaire was distributed to 66 project implementation team members who were selected purposively among them 58 responded, which represented a response rate of 87.8%. The data gathered through the questionnaire was analyzed by Statistical Package for Social Science (SPSS). The *generated data was analyzed using tables, frequency and percentage approaches. The result of the study indicated that ORHB employed all stages of quality management process even though some of the processes are overlooked. Inspection and statistical sampling are found to be the major quality management tools and techniques used to control quality of project. Qualified and experiences personnel, quality of materials and equipment used in the project construction and conformance to specification are identified as the top three factors in the determinant of the quality of primary hospital construction projects. In the study it is examined that various quality assurance measures were taken starting from defining project objectives and to monitoring and the tasks that were carried out mostly in weekly, monthly, quarterly monitoring at specified level with management members involvement. It was also identified that some barriers of quality management; inadequate management support, problems with contractors, unrealistic deadline, lack of quality management policy and strategy were the major once. The study also recommended that ORHB to have separate quality management policy in order to undertake complete project quality management process, enhance management involvement, capacity building on project management skills for effective implementation of primary hospital construction.*

Key Words: *Quality, Quality Management, Quality Management Process, Quality Management in construction projects*

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Project implementation and management focuses on three basic parameters: Quality, cost and time. A successfully managed project is completed at the specified level of quality, on or before the deadline, and within the planned budget. Client satisfaction also indicates success and opportunity for sustainability (UNCRD, 2000).

The best quality, time and cost are the important aspects of successfully managed construction project which fulfills the main goal of construction projects. Acknowledging the quality issues in construction and increasing demand for quality products and services, specific regulations to the implementation of the QMS have been framed. The quality management has to provide the environment within which related tools, techniques and procedures can be deployed effectively leading to operational success for a construction project. This tool and process of quality management are used to relate critical success factors to company processes. This establishes the foundation on which the continuous quality management proceeds to conduct a gap analysis that identifies processes and steps within processes where improvement opportunities might be made (Robert, 2003).

Quality is one of the main factors in the success of construction projects. Quality of construction projects, as well as project success, can be regarded as the fulfillment of expectations of the project stakeholder. Quality, cost and time have been recognized as the main factors concerning the client. However, for the majority of projects, the cost and time parameters are the main pre occupying factors for construction project. The quality in the construction industry is linked with client's satisfaction and the implementation of a quality management is a key tool in consistently and reliably managing the construction (Mane, 2015). Generally, managing customer satisfaction is one of the basic success of the project "The customer, or the recipient of the project's deliverables, expects a certain level of functionality and quality from the project" (Robert, 2003).

QMS has many applications in the construction project. It could be implemented either at the company level or at the project level. From the perspective of a construction company, quality management in construction projects should mean maintaining the quality of construction works at the required standard so as to obtain customer's satisfaction that would bring long term competitiveness and business survival for the companies.

The construction project has increased rapidly in the recent years, reflecting the interest of private and public sector investing more funds into development in developing countries like Ethiopia. Moreover attention is given to basic social sector infrastructure in public sectors particularly Health, Education, Water and other projects. Now quality management has become an integral part of construction projects (Birhanu, 2011).

Therefore, the role of quality management for a construction project is not an isolated activity, but intertwined with all the operational and managerial processes of the construction project. The quality management system in construction projects refers to quality planning, quality assurance and quality control. Therefore, this paper tries to assess quality management practices of hospital construction project of Oromia regional State Health Bureau.

1.2. Organizational Background

The study is conducted in Oromia Region which is one of the biggest regions of Federal Democratic republic of Ethiopia. Oromia Regional Health Bureau is one of the public social sectors which were formed as independent regional public services provider proclamation in 1987. It is established with a mission "To reduce morbidity, mortality and disability to improve the health status of the people through providing and regulating a comprehensive package of preventive, curative and rehabilitative health services via a decentralized and democratized health system." and with a long term vision of "To see healthy, productive, and prosperous people" (ORHB Report, 2016).

The head office is located at regional capital city Finfinne (Addis Ababa) and working in 333Woredas of 20 zones of the region providing health and health related activities in 1389 health centers, 6559 health posts and 79 functional hospital. Since its establishment ORHB

has been undertaking construction of various projects includes health center, regional laboratories, blood bank construction, referral hospital, Zonal and primary hospitals.

The region is committed to increase quickly the coverage of health services and had planned to reach the targets of the five year plan. According to the health sector transformation program (HSTP), one health centre is designed to serve 25,000 populations in rural while 40,000 in urban, one health post is intended to serve 5000 populations. To realize this, the ORHB in collaboration with the Federal Ministry of Health, other development partners through involving local communities, a number of health facilities were put under construction with a view to achieve universal access to primary health care services at the end of plan period. Thus, the regional health bureau has 65 functional public hospitals, 50 under construction out of which 11 are expected to begin service by the end of 2009 EFY (ORHB, Report 2009).

1.3 Statement of the Problem

Project quality management involves both quality assurance (planning to meet quality requirements) and quality control (steps taken to control results to see if they conform to requirements). Quality can be defined as the level of conformance of the final deliverable to the customer's requirements. One cause of usual project failure is that quality is overlooked or scarified so that a tight deadline can be met. It is very helpful to complete a project on time, only to discover that the thing delivered will not work properly (PMI, 2008).

Furthermore, the concept of quality management is to ensure efforts to achieve the required level of quality for the product/service which are well planned and organized. From the perspective of construction projects, quality management should mean maintaining the quality of construction works at the required standard so as to obtain customers' satisfaction that would bring long term competitiveness and business survival for the companies (Abdul-Rahman, 2011). Quality management is critically required for private and public basic social sector construction projects which are highly challenging and viable. Harris and McCaffer (2001) explained that quality management has to provide the environment within which related tools, techniques and procedures can be deployed effectively leading to operational success for a company.

The role of quality management in construction project is not an isolated activity, but integrated with all the operational and managerial processes of the company. It is accomplished through an integrated effort between all levels of a company to increase customers' satisfaction by continuously improving current performance (Biggar, 1990). In order to control quality management in construction projects several tools and techniques were identified as part of the implementation process, including, benefit/cost analysis, benchmarking, flow-charting, design of experiments, cost of quality, quality audits, inspection, control charts, praetor diagrams, statistical sampling, flow-charting and trend analysis (Abdul-Rahman, 2011).

There are few studies made on project management in general and quality management in particular in the Ethiopian context. These few studies also focused on general project management related, some of them are; Temesgen (2007) studied challenges of project cycle management in Federal level public sectors Abraham (2004) studied causes of project failures in Ethiopian Road Authority and Abraham (2004) studied performance of roads and education building projects in Ethiopia.

According to Feyisa (2014) in his Project Management Failures and Factors research work stated that projects are tools through which development policies and programs are translated into practice, many public sector development projects implemented usually take more time, require additional budget and customers complied about quality of project outputs. Similarly Abraham (2004) citied by Feyisa(2014) showed to enhance understanding of low performance of public construction projects in Ethiopia by taking two case studies from public construction projects. The research indicated that the performances of public construction projects exhibited low accomplishment rates. Consequently, completion time, cost overruns and strongly associated with quality related issues contributed to low performances for both the case studies (Abraham, 2004). Other study by Fetene stated that "Building projects that are delivered within estimated cost, specified quality, and calculated time can greatly satisfy client, contractor and consultant and also the project can be said it is delivered in successful manner. But almost all building projects in our country are not lucky to be delivered successfully to the client" (Fetene, 2008). This is also further strengthened another study which states that "From the view point of cost, completion time and quality of

the projects, the construction Industry of Ethiopia is not at required level compared to the rest of the world" (Amare, 2015).

Additionally specific to hospital quality related a study on quality improvement projects was conducted under the title "Hospital quality improvement in Ethiopia: a partnership–mentoring model" in 14 government hospitals within six regions and two city administrations. The improvements were not uniform across all hospitals. Mentoring on quality improvement seemed to have a positive overall effect in key areas. This finding is consistent with another study which indicated that quality improvement efforts critical for effective project implementation and management (Elizabeth, 2008).

According to report from Oromia regional Health Bureau Hospital Construction progress in 2016 there are various challenges on the construction of the primary hospitals such as; backlog projects, intermittent supply of finishing materials, quality concern, very less attention is rendered to finish the project, the contractor is non-responsive to the client, insufficient deployment of construction materials, excessive delay in which most of the projects are behind the schedule, shortage of materials & equipment supply, below average performance for instance analysis of 2007 projects show that the performance is only 13.74% from the target 30%(ORHB report, 2016).

Therefore, based on what has been done in other contexts, Ethiopia and practical problems observed in the hospital projects in Oromia indicated above this work aims to assess project quality management practices and causes of quality problems with special focus on construction of primary hospital projects in the region.

1.4 Basic Research Question

1. How quality management is practiced in relation to project management process in primary hospital construction projects in Oromia?
2. What are the key factors challenging project quality implementation and management in the primary hospital construction projects?

1.5. Objectives of the Study

1.5.1. General Objective

The general objective of the research is to assess the quality management practices and major quality management challenges in hospital construction projects in Oromia.

1.5.2. Specific Objectives

The specific objectives of the research are to:

- ✓ Assess quality management practices in relation to project management process in hospital construction projects;
- ✓ Identify the major challenges of quality management in hospital construction projects

1.6. Scope (Limitation) of the Study

This study is limited to quality management practices and challenges of public primary hospital construction projects limited to primary hospital construction projects administrated by Oromia Regional Health Bureau. Generally, the study is limited to examining the nature of process quality management in the project management process thereby identifying the root causes of achieving project quality in primary hospital construction projects within the last five years (2012-2016).

This study is also limited to project owners and consultant while actors in project implementation and management are also contractors and beneficiaries (the community) among others due to limited financial capacity and shortage of time.

1.7. Significance of the Study

Successfully managed and implemented projects play a key role in the improvement human health and contribute to improved productivity. Project management in general and quality management in particularly is at its infant stage of development as a profession especially in Ethiopian. This research also aims to add to the existing literature and findings for other similar related projects to improve quality problems through successful implementation and management of projects.

Therefore, this research work will contribute to the development of the disciple and adds to the project management body of knowledge by providing additional experiences in Ethiopian context. The study findings also are relevant input to the management of Oromia regional health Bureau in identifying the existing strength and weakness of quality management of hospital construction projects in order to apply the existing projects and to similar projects in the future. Likewise, other development projects can also use the result of the work to improve the quality related problems in construction projects. Moreover, it is believed to provide insight to development policy makers, development program/project designers, donors and non-government organizations. Furthermore, it may serve as a starting point towards further studies in the area at regional and national levels.

1.8. Organization of the Study

The study is organized into five chapters. The first chapter presents introduction of the study. It includes background of the study and the organization, statement of the problem, objectives, scope, significance and limitation of the research. Chapter two covers the review of related literature. Research design and methodology is given in chapter three. Chapter four is about Data presentation, analysis and discussions. The last chapter deals with summary of findings, conclusion and recommendations.

CHAPTER TWO

Review of Related Literature

2. Introduction

This section covers review literature of different scholars and authors that have been reviewed in the area of project management with special focus on project quality management. It deals with both theoretical and practical findings of various researchers concepts related to projects, project management, project quality management process, project quality management tools and Techniques, quality management implementation and management challenges. It deals with the review of related literature gathered from different secondary sources such as published books, articles and related websites. In this regard, efforts were exerted to include as much significantly related literatures as possible by reviewing available documents that exhibits points, targeting at the attainment of the research objectives.

2.1. Theoretical Literature Review

2.1.1. Project and Project Management

2.1.1.1 Project

A project can be defined in various ways since some writers and practitioners of project management state the meaning of projects as undertaking task that has a beginning and an end; requires budget and resources, and has a goal or objective to achieve, that may range from simple activities to mega projects that require many years and huge amount of budget.

A project is a task that is performed by a temporary organization in order to achieve a predetermined result. Projects are not limited in size or in persons involved but are always temporal and have a clear start and end. Projects can be used for different kinds of purpose, but most commonly they are used for realizing organizational goals. (Tonnquest, B(208) cited by Lund 2011).

Moreover, one of the most commonly accepted definition of a project is that "A project is a sequence of unique, complex, and connected activities that have one goal or purpose and that

must be completed by a specific time, within budget, and according to specification"(Wysocki, 2014: 3). This definition consists of attributes that to be called a project; an undertaking should be unique, have one goal and completed within constraints. Likewise, the organization of Governance Commerce defines a project as "a unique set of coordinated activities with definite starting and finishing points undertaken by an individual or team to meet specific objectives within defined time, cost and performance parameters as specified in the business case". Also a project is "a unique endeavor to produce a set of deliverables within a clearly specified time, cost, and quality constraints"(UNCRD,2000: 1)

2.1.1.2. Project Management

Over the years, several authors' definitions of project management were published. One of the most significant definition is given in PMBOK, which defines project management as "the application of knowledge, skills, tools and techniques to project activities in order to meet or exceed stakeholder needs and expectations from a project" (PMOK, 2013: 6). It is about creating an environment and conditions in which desired objective can be achieved in a controlled manner by a team of people and accomplished through the application and integration of the project management processes i.e., initiating, planning, executing, monitoring, controlling and closing.

Proper management of project as stated in PMOBK includes but not limited to the requirement identification, addressing stakeholders concerns, needs and expectations in planning and implementation of projects, maintain internal and external stakeholders' management and communication. Moreover, balancing of project competing constraints mainly scope, Quality, schedule, budget, resources and risks which are the most common factors(PMBOK, 2013). To this end there is strong relationship among each factor since there is interdependence to influence each other for example if there is time or cost overrun on the projects it has direct impact on targeted quality (Nader, 2011).

2.1.2. Overview of Quality Management

Quality has been characterized by many authors as something that relates to the results of an ongoing improvement that includes products, services, processes and people to fulfill customer expectations and customer satisfaction. Formal writing on the concept of quality can be found from quality gurus such as Deming (1986), Crosby (1979), Feigernbaum (1991) and Ishikawa (1985). As literature indicate that Gurus have laid the foundation for understanding most concepts of quality management such as TQM, Total Quality Control and Quality Management systems.

2.1.2.1 What is Quality?

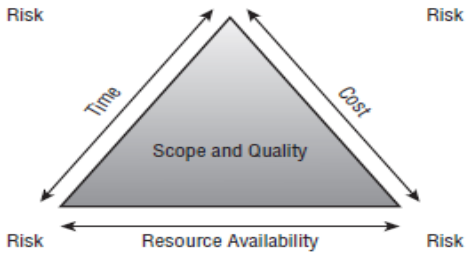
Quality has been defined from various perspectives. According to Shen Quality as satisfying or exceeding customers requirements and expectations, and consequently to some extent it is the customer who eventually judges the quality of a product (Shen, 2000). Moreover, Crosy who is one of the major contributors to quality improvements has four components of absolute quality these are; conformance to requirements, prevention, and performance standard is "zero defects" and measured by the cost of nonconformance (Kerzer, 2003).

Furthermore, the Kodak definition of quality is those products and services that are perceived to meet or exceed the needs and expectations of the customer at a cost that represents outstanding value. Additionally, the ISO 9000 define quality as "the totality of feature and characteristics of a product or service that bears on its ability to satisfy stated or implied needs"(Abdulaziz, 1999).

Additionally Wysocki identified two types of quality as part of every project; the first is *product quality* which refers to the quality of the deliverable from the project. The second type of quality is *process quality*, which is the quality of the project management process itself. The later mainly focus on how well the project management process works and how can it be improved (Wysocki, 2003). Moreover, he described projects with the following constraints: scope, cost, time, resources, quality and risk. Except for risk these constraints are connected, a change in one constraint will affect at least another constraint. The scope triangle clearly illustrate variables of the project and there interdependence. Similarly PMI illustrates project quality through the concept of the triple constraint—project scope, time

and cost. Project quality is affected by balancing these three interrelated factors. "The relationship among these factors is such that if any one of the three factors changes, at least one other factor is likely to be affected" (PMBOK, 2004). The following scope triangle clearly illustrate variables of the project and there interdependence.

Figure 2.1 Triple Constraint or "iron triangle."



Source: Effective project Management, 2014

2.1.2.2. Project Quality Management

As scholars justify that project quality management as a process, according to Crawford the overall aim of quality management is to satisfy the customer, conform to requirements, ensure fitness for purpose, and to ensure the product for use. Project model looks at quality management as set of activities or tasks that are required to ensure the project satisfies all the needs for which it was undertaken based on documented in the state of work and includes a focus on quality management from the perspective of product, processes, and the people needed to make quality an effective and efficient aspect of successful project completion (Crawford, 2002).

Moreover, Wysocki in his effective project management book states that: A sound quality management programs with processes in place that monitor the work in a project is a good investment. It is not only contributes to customer satisfaction but also it helps organizations use their resources more effectively and efficiently by reducing waste and rework. He further described "Quality management is one area that should not be compromised. The payoff is a higher probability of successfully completing the project and satisfying the customer" (Wysocki, 2014:8).

PMBOK Guide explains that "Project Quality Management includes the processes and activities of the performing organization that determine quality policies, objectives and responsibilities so that the project will satisfy the needs for which it was undertaken. It implements the quality management system through policy and procedures with continuous process improvement activities conducted throughout, as appropriate" (PMBOK, 2008:189). Furthermore, the PMI's PMBOK states that project quality management include

- To identify all the quality standards relevant for the project and plan how to satisfy them.
- To evaluate the project to ensure that the relevant quality standards will be met
- To monitor, to compare with the relevant quality standards, and to correct the product and the processes.

The concept of quality has existed for many years, but its meaning and perception has changed and evolved over time. Before the early twentieth century, quality management meant inspecting products to ensure that they met specifications (Reid and Sanders, 2007 cited in Sabah 2011). Similarly Harold (2003) descried the changing view of quality in the past and present as follows.

Table 2-1 Changing Views of Quality

No	Past	Present
1.	Quality is the responsibility of blue-collar and direct labor employees the floor and the overhead staff	Quality is everyone's responsibility, including workers working on white-collar workers, the indirect labor force,
2.	Quality defects should be hidden from the customers (and possibly management)	Defects should be high-lighted and brought to the surface for corrective action
3.	Quality problems lead to blame, faulty justification, and excuses	Quality problems lead to cooperative solutions
4.	Corrections-to-quality problems should be accomplished with minimum documentation	Documentation is essential for "lessons learned" so that mistakes are not repeated
5.	Increased quality will increase project costs	Improved quality saves money and increase business
6.	Quality is internally focused	Quality is customer focused
7.	Quality will not occur without close supervision	People want to produce quality products of people
8.	Quality occurs during project execution	Quality occurs at project initiation and must be planned for within the project

Source: **Harold K, 2003 P. 758**

From the Harold changing view of comparing the previous and current shows that quality as the process and dynamic concept which changes from individual based to collective, hidden to remedial solution, complain to two-way, rather than documentation to learn to improve, from incurring cost to minimize and enlarge the company, from internal to customer centered by producing quality product by focusing on the whole process of the project cycle rather than focusing only on the quality during implementation only. Therefore this may inferred that quality is dynamic concept for improvement of the business from one person to group for improvement of the business to meat organizational goal.

2.1.2.3. Quality Policy

As different scholars state quality policy is considered as a guide for improving quality of products and services. As Dale (2003) stated that an organization's quality policy is part of its strategic planning process, which includes setting the direction for the company to improve its situation for long-term prosperity and ending the means to achieve that direction. The main idea is to communicate throughout the company that something should be done in terms of quality if the company is to survive and compete in the future (Dale, 2003).

The Japanese approach known as 'Hoshin Kanri', or policy deployment, can be adopted when defining a company's quality policy (Tennant & Roberts, 2000, described its major elements). The main advantages of this approach over conventional planning systems are that it combines strategic objectives with tactical daily management, covers all functions in a company and increases quality goals' consensus. Moreover, Kerezen (2003) defined quality policy as " a document that is typically created by quality experts and fully supported by top management. The policy should state the quality objectives, the level of quality acceptable to the organization, and the responsibility of the organization's members for executing the policy and ensuring quality. The quality policy is instrumental in creating the organization's reputation and quality image"(Kerezen, 2003: 771). He also described good quality policy as

- Statement of principles stating what, not how
- Promote consistency throughout the organization and across projects
- Provide an explanation to outsiders of how the organization views quality
- Provide specific guidelines for important quality matters
- Provide provisions for changing/updating the policy

2.1.2.4 Total Quality management

The concept of Total quality management (TQM) movement started in Janpan during the 1950s. In 1980's it became increasingly popular in the United States and Europe as a result of the success of Japanese firms in global market. Since the 1990's, quality management becoming one of the main and accepted issues in many organizations (Jackson, 2009).

TQM is generally considered to be a higher level concept of strategic achievement than that provided by quality management system. McGregor and Parlmer (2002) view TQM, firstly, as an approach to ensure that a whole organization is involved in producing high quality outcomes in everything they do; secondly, in improving the continuous implementation of quality management; and finally, in achieving the primary objectives of customer satisfaction. Based on these objectives and guidelines for providing continuous improvement of quality in construction project, an effective TQM-based set of values is also an essential requirement for service providers, to generate qualified activities and the desired outcomes (Willar, 2012). This indicates that effective TQM program has continuous improvement, employee empowerment, bench-marking and team approach.

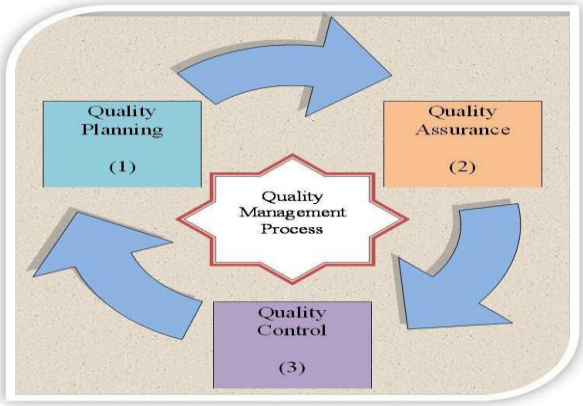
2.1.2.5. Principles of Quality and Quality Management

Kodak identified five principles of quality these are leadership, customer focus, analytical approach, teamwork and continuous improvement which is the center of his principle (**Harold K, 2003)**. In addition according to Evans and Lindsay Quality Management is based on three fundamental principles (Evans and Lindsay, 2008) cited in Sabah (2011); these are: i) Focus on customer and stakeholders; ii) Participation and teamwork by everyone in the organization; iii) A process focus supported by continuous improvement and learning.

2.1.3. Project Quality Management Process Flow

As defined in the PMBOK, Project quality management processes flow provides an overview of the processes which include: Plan Quality Management, Perform Quality Assurance, and Control Quality.

Figure 2.2: *Project Quality Management Process*



Source: Singatha Afrika Management Services, Quality Management for Delivering Sustainable Construction Projects in South African Rural Areas: The Construction Project Manager's Perspective. 2010 page 5.

2.1.3.1. Stage 1: Quality Planning

As per project management for development (PMD4), the first step in quality management is to define quality which is under taken by the project manger and the team to identify what quality standards will be in the project from perspectives of key stakeholders of the project depending upon the area of specialization of the projects for instance health may have some standard definitions of quality that can be used by the project.

Liydia (2010) on his part defined as the guidelines to ensure the quality in planning are: (i) Ensure that all relevant parties involved including consultants, subcontractors and suppliers are included in the task of quality planning for the project; (ii) Establish and define the purpose of the quality system; (iii) minimize the effort required to amend copies of documents; (iv) Set up a quality system development team so that the team can produce an effective plan; (v) Ensure that throughout the quality planning task constantly focused on the customer requirements.(Liydia, 2010).

Harris and McCaffer, (2001) defined quality planning as a set of activities whose purpose is to define quality system policies, objectives, and requirements, and to explain how these policies will be applied, how these objectives will be achieved, and how these requirements will be met. Subsequent to this definition, Construx,(2003) stressed that quality plan is different from a test plan. The study continued that quality plan defines the quality goals, is

realistic about where defects come from, Selects appropriate detection and prevention methods, and has means not to “go dark” (Construx, 2003).

The Project Management Book of Knowledge “PMBOK” also defined quality planning as the process for "identifying which quality standards are relevant to a project and determining how to satisfy them": In other words, it means planning how to fulfill process and product (deliverable) quality requirements: "Quality is the degree to which a set of inherent characteristics fulfill requirements". By planning the quality one has to respect some principles, and these are:

- *Customer satisfaction comes first*: Quality is defined by the requirements of the customer
- *Prevention over inspection*: It's better to avoid mistakes than to inspect the result and repair the defects.
- *Management responsibility:* Costs of quality must be approved by the management.
- *Continuous improvement*: Becoming better is an iteratively structured process.

2.1.3.2. Stage 2: Quality Assurance

Harris and McCaffer, (2001) defined quality assurance as a set of activities whose purpose is to demonstrate that an entity meets all quality requirements. Quality assurance activities are carried out in order to inspire the confidence of both customers and managers, confidence that all quality requirements are being met. Moreover, the main objective of quality assurance measures in information processes is to fulfill a required quality level (Harris and McCaffer, 2001).

In general quality assurance is a process to provide confirmation based on evidence to ensure to the donor, beneficiaries, organization management and other stakeholders that product meet needs, expectations, and other requirements. It assures the existence and effectiveness of process and procedures tools, and safeguards are in place to make sure that the expected levels of quality will be reached to produce quality outputs. Therefore, quality assurance occurs during the implementation phase of the project and includes the evaluation of the overall performance of the project on a regular basis to provide confidence that the project will satisfy the quality standards defined by the project.

2.1.3.3. Stage 3: Quality Control

Quality control is the use of techniques and activities that compare actual quality performance with goals and define appropriate action in response to a shortfall. It is the process that monitors specific project results to determine if they comply with relevant standards and identifies different approaches to eliminate the causes for the unsatisfactory performance. The goal of quality control is to improve quality and involves monitoring the project outputs to determine if they meet the quality standards or definitions based on the project stakeholder's expectations. Quality control also includes how the project performs in its efforts to manage scope, budget and schedule (PDEM, 2014).

The PMBOK refers to quality control as the technical aspect of quality management. Project team members who have specific technical expertise on the various aspects of the project play an active role in quality control. They set up the technical processes and procedures that ensure that each step of the project provides a quality output from design and development through implementation and maintenance. Each step's output must conform to the overall quality standards and quality plans, thus ensuring that quality is achieved (PMI, 2008).

According to Harold (2003) a good quality control system will; "Select what to control, set standards that provide the basis for decisions regarding possible corrective action, establish the measurement methods used, compare the actual results to the quality standards, act to bring nonconforming processes and material back to the standard based on the information collected, monitor and calibrate measuring devices and include detailed documentation for all processes" (Harold, 2003: 796). Similarly Juran quality control relies on five basics: a clear definition of quality; a target, a clear goal; a sensor, a way to measure actual performance; a way to interpret the measurement and compare with the target; and a way to take action, to adjust the process if necessary(Juran, 1999).

Additionally, Investopedia explains as cited by Agbenyega 'Quality Control' as a process through which a business seeks to ensure that product quality is maintained or improved and manufacturing errors are reduced or eliminated. Quality control requires the business to create an environment in which both management and employees strive for perfection. This is done by training personnel, creating benchmarks for product quality, and testing products

to check for statistically significant variations. A major aspect of quality control is the establishment of well-defined controls (Agbenyega, 2014).

2.1.3.4. Stage 4: Quality Improvements

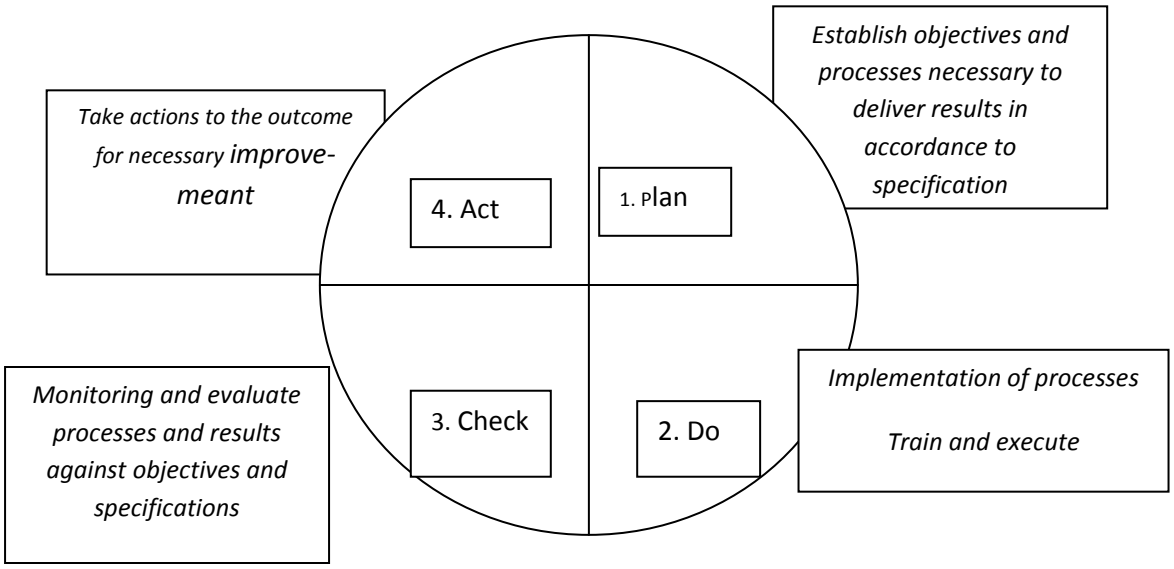
Quality improvement refers to the application of methods and tools to close the gap between current and expected levels of quality by understanding and addressing system deficiencies and strengths to improve, or in some cases, re-design project processes.

A variety of quality improvement approaches exists, ranging from individual performance improvement to redesign of entire project processes. These approaches differ in terms of time, resources, and complexity, but share the four steps in quality improvement: identify analyze, develop and test.

In general, quality improvement is the systematic approach to the processes of work that looks to remove waste, loss, rework, frustration, etc. in order to make the processes of work more effective, efficient, and appropriate.

According Walter A. Shewhart who was the developer of control charts and the continuous cycle of process improvement which was popularized by Deming who was a disciple of Shewhart, popularized the Shewhart Cycle as the Plan-Do-Check-Act (PDCA) cycle.

Figure 2.3. The Deming cycle for Improvement



Source: *Huemann, M, Improving Quality in Projects and Programs, Chapter 37 in Morris P.W. and Pinto. J.K. (eds), The Wiley Guide to Managing Projects, Wiley & Sons, 2004*

In general different scholars put various approaches to Quality improvement. The most popular philosophers in quality management put different approach on quality improvements, among these the following are the steps by the famous quality scholars.

Table 2.2: Quality Management Pioneers View on Quality Improvement

Deming's 14 Points to Quality Management	**Juran's 10 Steps Quality Improvement**	**Crosby's 14 Steps Quality Improvement**
1. Create constancy of purpose for improvement of product and service. 2. Adopt the new philosophy. 3. Cease dependence on inspection to achieve quality. 4. End the practice of awarding business on the basis of price tag alone. Instead, minimize total cost by working with a single supplier. 5. Improve constantly and forever every process for planning, production, and service. 6. Institute training on the job. 7. Adopt and institute leadership. 8. Drive out fear. 9. Break down barriers between staff areas. 10. Eliminate slogans, exhortations, and targets for the work force. 11. Eliminate numerical quotas for the workforce and numerical goals for management. 12. Remove barriers that rob people of workmanship. Eliminate the annual rating or merit system. 13. Institute a vigorous program of education and self-improvement for everyone. 14. Put everybody in the company to work to accomplish the transformation	1. Build awareness of the need and opportunity for improvement. 2. Set goals for improvement. 3. Organize to reach the goals (establish a quality council, identify problems, select projects, appoint teams, and designate facilitators). 4. Provide training. 5. Carry out projects to solve problems. 6. Report progress. 7. Give recognition. 8. Communicate results. 9. Keep score 10. Maintain momentum by making annual improvement part of the regular systems and Processes of the company.	1. Make it clear that management is committed to quality. 2. Form quality improvement teams with representatives from each department. 3. Determine where current and potential quality problems lie. 4. Evaluate the cost of quality and explain its use as a management tool. 5. Raise the quality awareness and personal concern of all employees. 6. Take actions to correct problems identified through previous steps. 7. Establish a committee for the zero-defects program. 8. Train supervisors to actively carry out their part of the quality improvement program. 9. Hold a "zero-defects day" to let all employees realize that there has been a change. 10.Encourage individuals to establish improvement goals for themselves and their groups. 11.Encourage employees to communicate to management the obstacles they face in attaining their improvement goals. 12. Recognize and appreciate those who participate. 13.Establish quality councils to communicate on a regular basis. 14. Do it all over again to emphasize that the quality improvement program never ends.

Source*:* *Harvard book (*Harold, 200: 763*).*

The above table infers that in general all the pioneers agreed to quality management quality idea even if the steps they suggest various among the founder.

2.1.4. Quality Management in Construction

Defining quality of construction is more difficult due to the uniqueness of the project. Chang stated that "the product is usually not a repetitive unit but a unique piece of work with specific characteristics. Secondly, the needs to be satisfied include not only those of the client but also the expectations of the community into which the completed building will integrate. The construction cost and time of delivery are also important characteristics of quality." (Chang, 1999:3).

For Rumane, construction project quality management is defined as the fulfillment of owner's needs per defined scope of works within a budget and specified schedule to satisfy the owner's / user's requirements. The phenomenon of these three components can be the construction project trilogy (Rumane, 2011). Construction projects are custom oriented and custom designed, having specific requirements set by the customer to be completed within a finite duration and assigned budget. Every project has elements that are unique that means no two projects are identical. It is always the owner's desire that his project be unique and better. To a great extent, each project has to be designed and built to serve a specified need. Construction projects are more customized than a routine and repetitive business (Rumane, 2011).

2.1.4.1. Quality Plan in Construction Project

According to Chung typical quality plan contains most, if not all, of the following: (Chung, 1999: 45).

- brief description of project;
- list of contract documents and drawings;
- project quality objectives;
- site organization chart, with named personnel if known;
- responsibilities and authorities of project staff;
- site layout plan;
- construction programme and sub-programmes;
- schedules of subcontractor nomination, material and equipment
- procurement, based on the construction programme;

- list(s) of materials and appliances used for the project, showing the verification requirement of each;
- inspection and test plans, or list thereof;
- list of quality procedures and work instructions applicable to project—by making reference to the company's Quality Manual and Procedures;
- list of project-specific procedures, work instructions and inspection
- checklists, or target dates for their provision;
- list of quality records to be kept, including pertinent quality records from subcontractors;
- frequency (or provisional dates if possible) of internal quality audits;
- Frequency of updating the quality plan.

2.1.4.2. Quality Assurance in Construction Project

Quality assurance "is oriented towards prevention of quality deficiencies. It aims at minimizing the risk of making mistakes in the first place, thereby avoiding the necessity for rework, repair or reject" (Chang, 1999: 7).

He also stated factors that staffs at organizational levels must know, these are; to have appropriate organization structure, clear lines of responsibility and communication, clear definition and description of duties, correct specifications and drawings, proper training, appropriate procedures, and ready access to necessary instructions, motivation, have the right resources, plant and materials; appropriate checking, measurement or testing of products and keeping proper records(Chang, 1999).

2.1.4.3. Quality Control in Construction Project

Quality control in construction is the process of verifying that the project is built to plan, that the tolerances allowable by industry standard and engineering practices have been met and that the finished project meets with quality standards of the project as inspected by the involved stakeholders. A good quality control system should have the to consider; select what to control, set standards that provide the basis for decisions regarding possible corrective action, establish the measurement methods used, compare the actual results to the quality standards, act to bring nonconforming processes and material back to the standard

based on the information collected, monitor and standardize measuring devices, include detailed documentation for all processes (Chang, 1999).

2.1.5. Factors Affecting Quality

Lepartobiko (2012) stated that quality can be assured by identifying and eliminating the factors that cause poor project performance. Jha&Jha (2006) found that the project manager's competence and top management support are found to contribute significantly in enhancing the quality performance of a construction project. Lack of contractor experienced topped the quality related cause of project failure.

Turner (2000) on his part described good quality in the context of projects and programs as being to meet the customer requirement, meet the specifications, solve the problem, fit the purpose and satisfy the customer in this case the community who are served by the project.
Most of the scholars agree that project quality in construction sector is affected by various internal and external factors.

2.1.6 Quality Management Tools and Techniques

For the implementation of quality management in construction projects, where identification of quality standards, evaluation of overall project performance and quality control monitoring of specific project results in the quality management processes were defined by PMI(2000). Several tools and techniques were identified as part of the implementation process, like benefit-cost analysis, benchmarking, flow-charting, design of experiments, cost of quality, quality audits, inspection, control charts, pareto diagrams, statistical sampling, flow-charting and trend analysis.

Moreover, Silva (2001) divided quality tools and techniques that are in support for quality programs such as control charts, statistical sampling standards, control charts, quality circles, quality planning tools, self-assessment and benchmarking as techniques to measure quality of construction projects(Silva, 2001).

2.1.7 Quality Management Problems in Construction Projects

Quality is one of the main concerns in project management depending on the nature of the project especially in developing countries including Ethiopia. The research done by Birhanu

(2014) stated in his Fish-bone diagram, the root causes of quality problems which contributed to weak quality management practices in Ethiopia are leadership problems, lack of policy and strategy, inefficient resources management, inefficient process management, lack of customer focus and weak business performance. Furthermore, quality problems should be taken as an opportunity for improvement; problems can help identify more fundamental or systemic root causes and help develop ways to improve the process.

2.2. Empirical Review of Literature

The empirical literature provides empirical evidences of quality management practices in construction projects. Additionally, at the end of this section the conceptual framework of this study is presented.

Quality Management has increasingly been adopted by construction companies as an initiative to solve quality problems and to meet the needs of the final customer. Accordingly, this section is concerned with other studies conducted on other area in similar discipline. The first study selected for the empirical review is "*Study of Quality Management in Construction Projects*" in Malaysia. This research explores preliminarily the practices of quality management, management commitment in quality management, and quality management implementation problems in construction projects in the context of Malaysian construction industry. The study used semi-structured interview approach with twelve project management practitioners and analyzed using quantitative approaches. The findings of the study indicate that the state of quality management in construction projects in Malaysia needs to be strengthened and there are problems in relation to quality management implementation that require attention.

The other study conducted by Everline in his study on factors affecting the performance of Construction projects in Kenya, identified four major factors that most important determinants in general construction projects; Experience and qualification of personnel, quality of materials and equipments, conformance to specification and quality assurance training and meetings (Everline, 2014). In addition as Joy stated in his study on factors influencing quality of construction projects, the major factors that affect quality; material, labor,

financial issues, conformance to codes and standards, top management support, management factors, selection of contractor, selection of designer design, co-operation of parties, contract documents and lack of communication (Joy, 2014).

Further as stated by Agbenyega(2014) in his study in quality management practices of construction firms in Ghana, in solving the potential barriers are the main measures to be taken, namely: management commitment, communication between managers and employees, employee involvement, detailed and logical work program, regular inspection, quality audit report, lack of training and education of team members and review and analysis(Agbenyega,2014).

Temesgen on his study a Challenge for the Ethiopian Public Sector (Federal Level), identified three major problems related to unsuccessful projects in Ethiopian public sectors these are; resource problem shortage of adequately trained and skilled human, financial and material resources, Management problems such as weak sharing of responsibility during planning, weak follow-up, poor coordination and Technical problems which include loose linkages with sectoral policy and strategy, weak technical skill and poor project design are some of the identified problems contribute to project failure in Ethiopia public sectors (Temesgen, 2007).

Further Birhanu in his study on his he identified that lack of effective supervision, communication, management of commitment, proper equipments and materials available for use, quality assurance team lead the process, staff turnover, skilled turnover, Inefficient resource management and problems with contractors are some of the challenges he identified to the attainment of project quality (Birhanu, 2014).

The problems identified by different researchers are almost similar even though there is variation due to their practical context of the projects. Accordingly, these variables are also considered in my study to consider in the context of the primary construction projects.

2.3. Conceptual Framework of the study

The conceptual framework of the study is first assessing the Parameters of Project quality management process and then followed by examination of major areas of project quality factors and management challenges. The following figure shows the details of the conceptual framework:

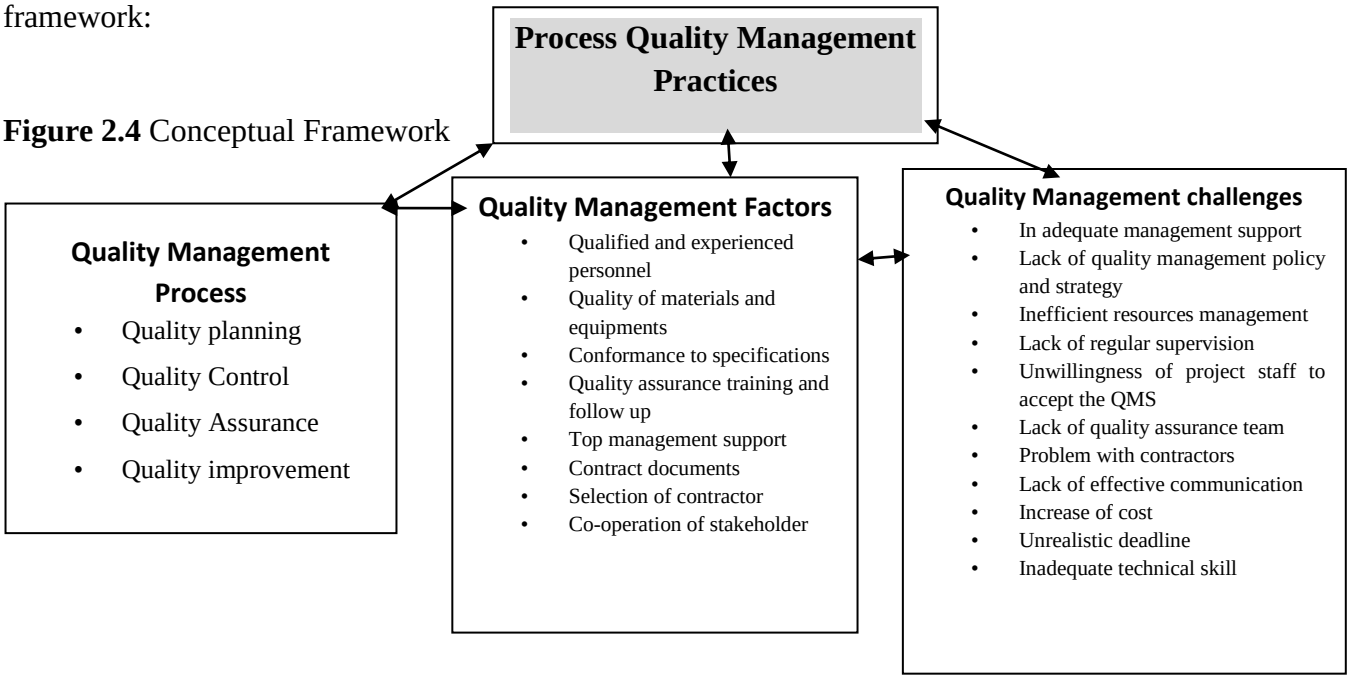


Figure 2.4 Conceptual Framework

CHAPTER THREE

Research Design and Methodology

Introduction

This chapter presents the activities and processes that were undertake in gathering data for the research work. It provides full details of how data are collected and processes for this research work. In the other words, this part discusses the methodology of the study. It explains the research design, sampling techniques and sample size determination, data sources, data collection tools used, validity and reliability test; describe how data collected from the research were analyzed and ethical considerations.

3.1. Research Design

In light of the objectives, this study the preferred and employed descriptive research method which qualifies and makes use of qualitative data since the method enables to easily be an instrument to analyze, tabulate and describe the context. The study adopts mixed research approach both qualitative and quantitative. According to Mark (2009), as cited in Aida (2015) mixing qualitative and quantitative approaches gives the potential to cover each method's weaknesses with strengthens from the other method. The study were employed descriptive research methods since the method enables to easily be an instrument to tabulates, analyses and describe the context. While describing the collected data use the visual aids such as graphs and charts are used so as to make the reader understand the data.

3.2. Sampling Techniques

To select the respondents for the questionnaire a purposive sampling technique was employed. This sampling method is chosen for it allowed the researcher to focus on a limited number of informants that were selected purposively from 41projects based on convenience to get the required information to carry out the study in order to get optimal insight. In this study projects are taken as unit of analysis. The respondents were selected based on their experience, information and area of work they have about project implementation and

management challenges in their respective organization in relation to hospital construction projects in Oromia.

3.3. Target Population and Sample Size

For the successful project quality management almost all member of the organization are responsible since they are involved directly or indirectly in the process. But due to limited time the sample is limited to ongoing primary hospitals construction projects by the region. Thus, due to the above mentioned facts 66 sample of Oromia hospital project implementation team are included in the sample from 41 ongoing projects. According to the report from ORHB during last five years there were 68 primary hospitals construction projects undertaking out of which 17 of them were completed and the remaining 41 projects are ongoing which the targets of this study are. Therefore, the focus of the primary data for sampling focus on the ongoing projects since the project management team is still on assignment to provide information. On the other hand the study tried to compare the practical experiences on quality management of the completed projects in order to apply to the ongoing but due to limited data only on cost and time it is not included in the study.

The target populations from various participants of the hospital construction projects were mainly from the client or owner side of the project; such as owner project manager, project management consultancy (PMC), and project monitoring team, various technical teams of the construction project from ORHB and Oromia Urban and Construction Bureau. The questioners were distributed and interview was conducted with concerned participants of project. In addition interview was conducted with Engineering and Maintenance Director at regional level. Regarding their qualifications the respondents are project manager from owner, project manager from consultancy, project engineer, project contract administrator and project supervisor.

3.4. Sources of Data

The study used both primary and secondary data. To obtain sufficient and relevant data that helps to answer the research questions and achieve research objectives, both quantitative and qualitative data were collected from different primary and secondary sources. The primary

sources of data were employees (professionals) on projects and at organizational level of ORHB selected for the study.

Apart from primary data, secondary data were also exploited to conduct the study. Documents review and analysis of secondary data from various sources were used as useful source of information for the study. Relevant books, text books, journals, organization's past and current written documents on the relevant issues were used. Moreover, available organizational documents such as structure, accessible project documents including agreement project profile, plans and reports were also reviewed.

3.5. Data Collection Tools/Instruments

The survey method was chosen by the researcher because of its popularity as a means of gathering much data in cost-effective way (Sunders, 2009). Therefore, semi-structured interview and questionnaires were administrated as survey instruments to the project manger of owners and project managers of consultants.

The main tools used to gather the primary data from the primary sources mainly include questionnaire, interview guides and experiences of the researcher. Regarding the questionnaire; primary data were collected using self-administered semi-structure questionnaire composed of close-ended and open-ended questions.

3.6. Procedures of Data Collection

In order to collect relevant data for the purpose of this study the above mentioned major instruments were applied. Accordingly the researcher has chosen this methods assuming that this is cost and time effective, data were analyzed and reduces basis since similar questions were distributed to each respondents. Secondly, interviews are considered as chosen instrument incase respondents misunderstand relevant questionnaires.

The methodology for the work consists of four step form. The first step is quality planning, second step is quality control; third step is quality assurance and last step quality improvement. Questionnaires have been prepared considering quality aspects and challenges of hospital construction projects in the region and the interviews of project manager was

conducted since the responses contributes to the understanding of current project quality management practices and problems of the hospital construction projects encountered.

The first phase of data collection was the establishment of the study framework which includes the survey and secondary data. The survey framework includes the identification of all relevant documentation and formulation of questions for the interviews and questioners. The second phase pilot test done on the questioners by distributing questions to verify the clarity and include any comments before distributing to the total target. And the final version of questioner distributed to respondents and finally collected the data. Likewise interview were used in gather more of in-depth qualitative data from the key informant of the project.

3.7. Validity and Reliability of Instruments

3.7.1. Validity

The researcher checked the validity of questioners developed for this study. Before distributing the final questionnaires to the respondents, it was be checked and commented by friends and project personnel and the advisor of the researcher and pilots done to check the valid. The final version of the questioners was distributed after incorporating all the comments and feedbacks obtained from different professionals.

3.7.2. Reliability

Reliability analysis was carried out for eleven items for internal consistency with regard to respondent's data on project quality management rating using cronbach's alpha and in principle cronbach's alpha of 0.7 is acceptable for internal consistency of data obtained from respondents. It is expressed as a number between 0 and 1 where the higher the score of Cronbach alpha, the more reliable the generated scale when the closer the alpha coefficient is to 1.0, the grater the internal consistency and the reverse is true. Therefore, the reliability is checked based on the data process on SPSS.

Table 3.2 Reliability Statistics

Cronbach's Alpha	No of Items
.860	11

Source: Survey Result 2017

The above table shows the computed result for reliability test which is 0.860 indicates that there was a high degree of internal constancy among the test items. Therefore, Cronbach's alpha value is 86%, well above acceptable level and fit as reliable for data analysis.

3.8. Methods of Data Analysis

After collecting all required data using the above mentioned instruments from the identified sources, both qualitative and quantitative methods of data analyses were applied. The data obtained from the questionnaire respondents used to assess the quality management practices and challenges was analyzed using SPSS (Version 20). After organizing, coding, and defining variables, responses of the cases were entered into the software. Then for analysis, both descriptive and inferential statistical methods were used. And results were presented using tables and figures.

3.9. Ethical Issues

Interaction with participants would be done after prior appointment and written letter from the University to Bureau. Questions were not be forced upon them to answer. Rather the purpose of the study would be explained to them to make them more comfortable to reply.

The researcher has declared that all participants were voluntary participate in the data collection by collaborating in filling of the questionnaire. By doing so, the respondents are free of any harm and more importantly their views were very confidential and anonymous. Moreover, the questionnaire does not have any connection with the respondents since it is done for education purpose.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND INTERPRETATION

4.1. Introduction

This chapter of the study presents result and discusses that the data collected to answer the research questions derived from objectives of the study set to achieve. The result of the survey was discussed by triangulating the different source results: questionnaire results, interview and document review results.

The process of data analysis involved first cleaning and editing to exclude irrelevant materials to the study. Data was then organized in terms of the two objectives of the study. A coding scheme was developed and data imputed into the Statistical Package for Social Scientists version 20 (SPSS) for descriptive statistical analysis. Code 1 was assigned to the lowest level of agreement while code 5 was assigned to the highest level of agreement with the respective statement.

The descriptive analysis and statistical calculation was done in order to interpret raw data into useful information. Descriptive data was analyzed using frequencies and percentages to find the views of the respondents on quality management practices of construction projects. The result of the analysis was presented in tables and charts.

Moreover, this chapter elaborates on the profile of the respondents and the surveyed projects, the general background of the projects. The study further identified practices of quality management with respective of project management process in the construction of primary hospital projects, the factors that influences quality of projects. The last section also assessed the challenges to quality management on projects.

4.2. Response Rate

A total of 66 questionnaires were sent to the client project management team of Oromia Regional Sate Health Bureau and consultant team of Oromia Urbana and Construction

Bureau that were involved in primary hospitals construction of projects team. The respondents were professionals who were purposively selected for this study. From both sectors the questioner directly focus on project staff involved at Bureau level and on the constriction sites as resident engineers who have full knowledge of the project to represent in filling questionnaires. After the data had been collected, 58 out of the targeted 66 questionnaires were responded to; therefore, 58 questionnaires were used in the analysis. This represented almost 87% response rate.

Table 4.1: Rate of Responses by Respondents

Questioner	**ORHB & OUCB Project Management & Consultant Team**	
	Respondents	**%**
Returned	58	87.8%
Not- returned	8	12.2%
Total	**66**	**100%**

Source: Survey Result, 2017

In the study respondents were from two public intuitions, Oromia regional health Bureau and Urban and Construction Development Bureau, with various positions from the owner and consultant sides. They were categorized as resident Engineering, construction project contract administration, designing, technical team and supervision of construction project while the rest belong to Urban and Construction Development Bureau.

4.3. General Information of Respondents

4.3.1. Gender Composition

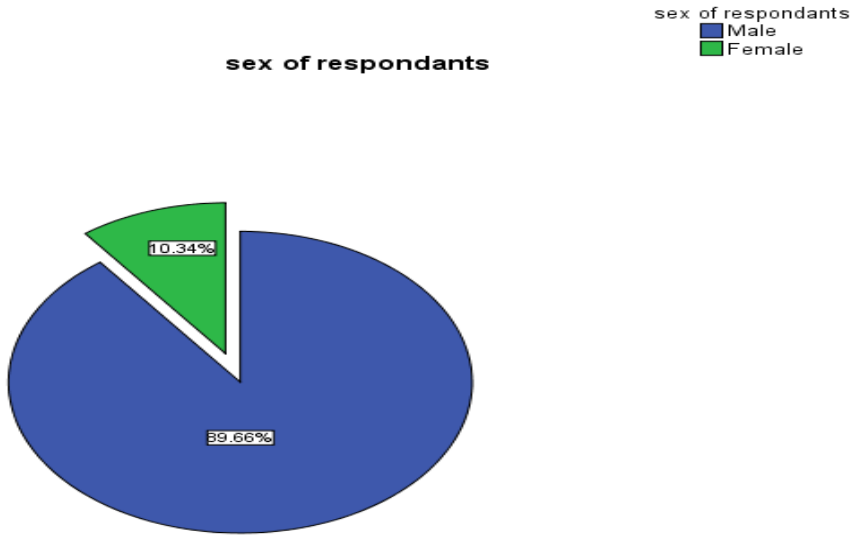
The demographic statistics shown in the figure below show the distribution of respondents by gender. Participants were asked to indicate their gender by selecting the appropriate option provided (male or female). Accordingly only 6 (10.34%) of the respondents were female while the remaining 89.7% were male. This clearly indicates that the sample population was dominated by male respondents.

Table 4.2. Sex of the Respondents

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	52	89.7	89.7	89.7
	Female	6	10.3	10.3	100.0
	Total	58	100.0	100.0	

Source: Survey result, 2017

Chart 1: Gender Distribution of Respondents



4.3.2. Educational Background

From the analysis on educational background of the respondents, it was found that only 5 respondents (8.6%) have College Diploma, 45 respondents (77.6%) are undergraduate degree, the rest 8 respondents (13.8%) have graduate degree /masters and above. This profile shows that majority of the respondents have undergraduate degree or first degree level.

Table 4.3: Educational Background of Respondents

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Collage diploma	5	8.6	8.6	8.6
	Bachelor degree	45	77.6	77.6	86.2
	Masters or above	8	13.8	13.8	100.0
	Total	58	100.0	100.0	

Source: Survey result, 2017

4.3.3. Role and Experience of Respondents

Positions that respondents currently hold in the organizations are grouped into five major categories as project manager (at Bureau level), project consultant, contract administration, supervision team, and resident Engineers (project managers at site). Accordingly, 2 (3.4%) hold project manager position at Bureau level, 4(6.9%) respondents hold position of contract administration, 6(10.3%) were project consultants, 11(19%) were project supervisor and 35(60.3%) were resident engineers (project managers at project site).

Table 4.4: Position of Respondents

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Project manager	2	3.4	3.4	3.4
	Contract administration team	4	6.9	6.9	10.3
	Project Consultancy	6	10.3	10.3	20.7
	Resident Engineer	35	60.3	60.3	81.0
	project supervisor	11	19.0	19.0	100.0
	Total	58	100.0	100.0	

Source: Survey Result, 2017

In addition, the study chose to consider respondent's level of experience in the project area, which is vital towards knowledge of project management. 51.7% of the respondents have up to 5 years, 31% have 6-10 years, only 5.2% of them have 11-15 years of experiences and the rest 12.1 % of the respondents have 16 and above years of experience.

4.4. Quality Management Planning Practices

4.4.1. Quality Policy

The other question is whether there is formal quality policy at organizational level for primary hospital constrictions projects. Most of the respondents (62.1%) consider the quality policy available to follow up the quality of the projects and the remaining (37.9%) respond as not available separately. To conform this the organizational level quality policy existence as separate document the interview with the head indicate that the contract document is considered as the quality policy which is prepared uniquely for each project which further contain the detailed guiding for quality management. Unlike Tennant & Robert (2000) which recommend organizational level quality policy as an approach over the conventional planning which increase quality goal consensus. And also contrasting to Kerezen suggestion of policy as statement of starting, promote consistency across projects, explain organizational view of quality and provide specific guideless for changing.

Table 4.5: Quality Management policy status of the ORHB

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	36	62.1	62.1	62.1
	No	22	37.9	37.9	100.0
	Total	58	100.0	100.0	

Source: Survey Result, 2017

4.4.2. Quality Planning Process

According to the interview with head of Engineering and Maintenance Department in ORHB, quality planning starts when specification of material is prepared based on EBCS by Ministry of Works & Urban Development, 1995. The document which aims to ensure compliance of constructions with the minimum requirements for design, procurement procedures, construction and quality of materials set down by the Ministry. Based on the standard set and the actual requirement and nature of specific primary hospitals project the Bureau starts preparing the bid specification document and announce the bid of the

construction projects to invite the competent contractors guided by the country procurement policy and procedures.

On the other hand the importance of quality plan was also part of the questioner. Most of the respondents were agreed to the importance of the quality management in the primary hospital construction projects. In the same manner they were requested to rate the level of importance as very low, low, moderate, high and very high levels. As a result 31(53.4%) as very high, 17(29.3%) as high, 3(5.2%) as moderate, 4(6.9%) rate as low, only three persons (5.2%) rate as very low. This might indicate that majority of the staff consider quality management is important in primary hospital constriction projects.

4.4.3. Content of the Quality Plan

The first question is whether there is quality planning contain the standard variables for construction project as recommended by Chung, (1999) on understanding quality assurance in construction. Therefore, the content of the quality plan is also part of the questioners distributed to respondents. Consequently, majority of the respondents respond yes on almost on all variables but below 50% for two variables. The following table describes the result of the findings.

Table 4.6 Content of the Quality Plan

Variable	Response	Count	Percent
Brief description of project	Yes	55	94.8
	No	3	5.2
List of contract documents and drawings	Yes	58	100
	No	0	0
Project quality objectives	Yes	43	74.1
	No	15	25.9
Site organization chart, with named personnel if known	Yes	30	51.7
	No	28	48.3
Responsibilities and authorities of project staff	Yes	36	62.1
	No	22	37.9
schedules of subcontractor nomination, material and equipment procurement, based on the construction programme;	Yes	35	60.3
	No	23	39.7
list(s) of materials and appliances used for the project,	Yes	46	79.3
	No	12	20.7
Inspection and test plans, or list thereof;	Yes	44	75.9
	No	14	24.1
list of quality procedures and work instructions applicable to project—by making reference to the company's quality manual and procedures;	Yes	43	74.1
	No	15	25.9
list of project-specific procedures, work instructions and inspection	Yes	39	67.2
	No	19	32.8
checklists, or target dates for their provision;	Yes	34	58.6
	No	24	41.4
list of quality records to be kept, including pertinent quality records from subcontractors;	Yes	31	53.4
	No	27	46.6
frequency (or provisional dates if possible) of internal quality audits;	Yes	22	37.9
	No	36	62.1
Frequency of updating the quality plan.	Yes	26	44.8
	No	32	55.2

Source: Survey Result 2017

Accordingly, the variable included in the quality plan of the organization are raked the top five variables as follows; list of contract documents and drawings has 100% agreed by all respondents this might be because of contract document is consider as quality policy manual as implementation guideline for the construction projects, followed by brief description of project(94.8%), list of materials and appliances used for the project(79.3%) ranked as third, inspection and test plans (75.9%) ranked fourth and both project quality objectives and list of quality procedures and work instructions applicable to project – by making reference to the company's quality manual and procedures count for (74.1%) are ranked fifth. On other hand frequency of internal quality audits and frequency of updating the quality plan which counts

below 50% that is 37.9% and 44.8% respectively disagreed by majority of the respondents which gets less emphasis as the content of the plan.

Unlike the literature which recommend the content of the quality plan as listed in the above table it may be indicate partially inclusion of the content and there is no separate document for quality plan for project but the respondents that the contract document as agreement includes of the contents of the quality plan for each project.

4.5. Quality Management Tools and Techniques Practices

As described in the literature part in the project quality managements there are different quality management tools and techniques to control quality of the projects. Here the primary question is whether there is actual performance measurement of the primary hospital construction projects in Oromia region. Accordingly 87.9% of respondents confirmed that there is performance measurement to control quality of the projects using different parameters and the rest 12.1% responds as no performance measurements for the project. The next question deals with types of quality measurement tools and techniques they use. Most of the respondents agreed with the use of quality measurement tools and techniques, about 46(79.3%) response were responded as yes the remaining 12 (20.7%) rejected the use of quality measurement tools.

In the table below a list of quality management tools and techniques were prepared based on the review of literatures. It is one of the objectives of the study to verify to what extent the tools and techniques stated are relevant in the local context of construction project quality management.

Table 4.7 Quality Management Tools and Techniques

No	Tools	Response	Count	Percent
1	Benefit Cost Analysis	Yes	2	3.4
		No	56	96.6
2	Benchmarking	Yes	1	1.7
		No	57	98.3
3	Flow-charting	Yes	1	1.7
		No	57	98.3
4	Design of Experiments	Yes	16	27.6
		No	42	72.4
5	Quality Audits	Yes	20	34.5
		No	38	65.5
6	Control Charts	Yes	12	20.7
		No	46	79.3
7	Inspection	Yes	46	79.3
		No	12	20.7
8	Pareto Diagrams	Yes	1	1.7
		No	57	98.3
9	Statistical Sampling	Yes	44	75.9
		No	14	24.1
10	Trend Analysis	Yes	6	10.3
		No	52	89.7

Source: Survey, 2017

As can observe from the above table in the primary hospital construction projects most of the quality management tools and techniques might not be applicable since most of the findings of the respondents are below. Accordingly, inspection seem as the common practices to most of the projects which count for 79.3% followed by statistical sampling (75.9%) and as responses from the interview design of experiment/laboratory test is used for conducting various types of test, e.g., concrete test, industrial materials, etc to verify whether the materials meat the quality standard requirement of the construction. Therefore, the others seems unrelated to the local context of the construction projects.

Meanwhile, resident engineers and regional level supervisor team are engaged in every project to supervise and inspect the construction works. In addition to selecting from the lists provided some of the respondents added on other. Few quality management tools and techniques were revealed from the interview which were not highlighted in the literatures are project weekly site reports, and monthly project status reports. Weekly site reports and monthly project progress reports are used as the monitoring tools of site activities, whereas

regular quarterly report including field monitoring are considered as the major monitoring tool.

4.6. Quality Assurance Practices

This section of the study discusses the desirable measures for effective quality assurance practices in the surveyed primary hospital construction project by Oromia region Health Bureau. To do this, the respondents were presented with six variables whether they consider it in their quality assurance of the project. These items are identified based on the literature from other similar projects and understanding quality assurance in construction projects, the following table summarizes the responses of the target respondents for the question do you consider the following factors in your quality assurance mechanism?

Table 4.8: Effective Quality Assurance Factors

Variable	Response	Count	Percent
purpose of the projects defined in the first instance	Yes	53	91.4
	No	5	8.6
Selects the appropriate quality system requirements for each contract	Yes	51	87.9
	No	7	12.1
Clearly specifies the quality system requirements in tender and contract documents	Yes	50	86.2
	No	8	13.8
Evaluates and selects subcontractors on their ability to satisfy specified requirements	Yes	49	84.5
	No	9	15.5
Monitors the works and the implementation of the quality system	Yes	50	86.2
	No	8	13.8
Collects reviews and controls the quality records that the supplier is contracted to provide.	Yes	54	93.1
	No	6	6.9

Source: Survey Result 2017

The above table present that 93.1% of the respondents said that collects reviews and controls the quality records that the supplier is conducted to provide, followed by the purpose of the projects defined in the first instance (91.4%).

Table 4.8 also shows that 87.9% reported as selects the appropriate quality system requirements for each contract, 86.2% clearly specifies the quality system requirements in tender and contract documents and similar percentage of respondents conform that monitors the works and the implementation of the quality system. The table further illustrates that while significant number of respondents (84.5%) reported evaluates and selects subcontractors on their ability to specified requirements as the component of quality

assurance mechanism. This again might imply that as majority of the respondents had confirmed that the bureau involved in quality assurance of primary hospital constriction projects.

In addition the interview conducted shows that the bureau assure quality of industrial material by taking sample at bureau technical group of three persons from different professions directly related to construction work before approval of the supply of industrial materials at construction sites and cross check on delivery of the material on the sites whether is based on the specification of quality requirements on the tender contract documents. Therefore they accept or reject the materials before starting the construction.

Moreover, on the process assuring quality of primary hospitals construction management, technical teams and site engineers follows on the regular supervision on quarterly, regular monitoring on monthly basis visit to sites and on daily basis respectively. Furthermore, Bureau head and four deputy Bureau heads at regional level cluster the region into five groups in order to follow the status of the projects by giving special attention for quality of projects with reference to contract agreements and the cross checks the projects reports prepared and presented by the responsible department from local level community and administration on the sites. Based on the reports there is also regular quarterly joint monitoring by organizing review meeting at Bureau level with all project stakeholders; Oromia health Bureau Engineering and Maintenance departments, panning, Monitoring and Evaluation process Owner, Finance and Economic Development Bureau, Urban and Construction Bureau heads and representatives, Contractors and resident engineers to discuss and ways forward to improve quality related problems. This may indicate that the project management system is participatory.

4.7. Factors Affecting Quality of Construction Project in Primary Hospital

This section of the study assesses the factors that influence the quality of project of the primary hospital construction project surveyed based on the literature reviewed list of factors. From Table 4.9 the respondents were presented with ten variables to rank from ‘great influence’ (5) to ‘very less influence’ (1) on the bases of their influence on the quality of

projects in the construction surveyed. The result of the responses is presented in the table below:

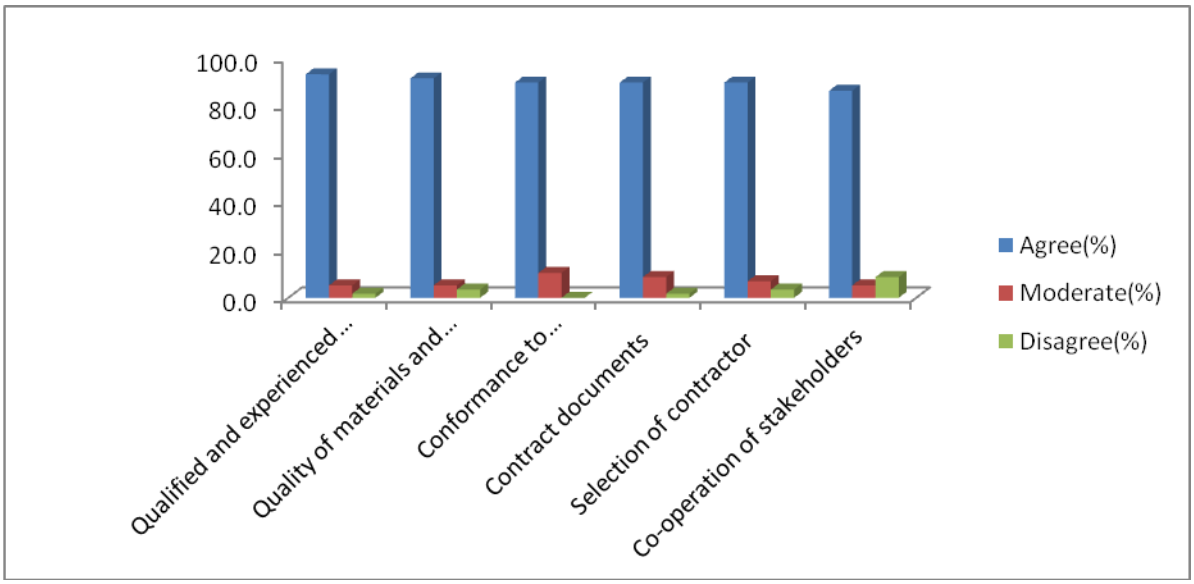
Table 4.9: Factors Affecting Quality of Projects

Quality Factor	# response	Strongly Agree	Agree	Moderately Agree	Less	Very less
Qualified and experienced personnel	58	44(75%)	10(17.2%)	3(5.2%)	1(1.7%)	0
Quality of materials and equipments used in the project construction	58	42 (72.4%)	11(19%)	3(5.2%)	1(1.7%)	1(1.7%)
Conformance to specifications	58	36 (62.1%)	16 (27.6%)	6(10.3%)	0	0
Quality assurance training and follow up	58	26(44.8%)	20(34.5%)	10(17.2%)	2(3.4%)	0
Top management support	58	25 (43.1%)	22 (37.9%)	10(17.2%)	1(1.7%)	0
Contract documents	58	39 (67.2%)	13 (22.4%)	5(8.6%)	1(1.7%)	0
Selection of contractor	58	39 (67.2%)	13 (22.4%)	4(6.9%)	2(3.4%)	0
Co-operation of stakeholders	58	27(46.6%)	23(39.7%)	3(5.2%)	3(5.2%)	2(3.4%)

Source: Survey Result, 2017

From above table qualified and experiences personnel(93.1%), quality of materials and equipments used in the project construction(91.4%) and conformance to specification(89.7%) ranked 1st, 2nd, and 3rd respectively are estimated the three most important factors in the determinant of the quality of primary hospital construction projects undertaken by the ORHB surveyed. Existing literature indica1tes that a quality system is designed to provide an assurance to clients, which can be supported through documented records, that all contracts will be completed in accordance with the agreed time, cost and specification. However, the least influential factor in terms of the quality of projects undertaken by the survey was co-operation of stakeholder, top management support and quality assurance training and follow-up.

Chart 2: Quality Management Factors in Hospital Construction Projects



4.8. Problems in Project Quality Management

The respondents were asked if they encounter problems as highlighted in the literatures for the implementation of quality management is concerned. List of problems was as shown in Table 4.10. As for the problem which was not discussed in the literatures also identified by respondents and details for the feedbacks from the respondents are illustrated below;

Table 4.10 Problems to Project Quality

Problem	# Responses	Very Strongly Agree	Strongly Agree	Moderately Agree	Less	Very less	Rank
In adequate management support	58	23(39.7%)	22(37.9%)	4(6.9%)	6(10.3%)	3(5.2%)	1
Lack of quality management policy and strategy	58	19(32.8%)	21(36.2%)	10(17.2%)	4(6.9%)	4(6.9%)	3
Inefficient resources management	58	19(32.8)	18(31%)	14(24.1%)	3(5.2%)	4(6.9%)	5
Lack of regular supervision	58	12(20.7%)	12(20.7%)	14(24.1%)	8(13.8%)	12(20.7%)	8
Unwillingness of project staff to accept the quality management system	58	9(15.5%)	15(25.9%)	14(24.1%)	10(17.2 %)	10(17.2%)	8
Lack of quality assurance team leading the process	58	18(31%)	14(24.1%)	12(20.7%)	9(15.5%)	5(8.6%)	7
Problems with Contractors	58	28(48.3%)	17(29.3%)	9(15.5%)	2(3.4)	2(3.4)	1
Lack of effective communication	58	13(22.4%)	22(37.9%)	12(20.7%)	7(12.1%)	4(6.9%)	6
Increase of cost	58	15(25.9%)	23(39.7%)	7(12.1%)	7(12.1%)	6(10.3%)	4
Unrealistic deadline	58	23(39.7%)	20(34.5%)	8(13.8%)	5(8.6%)	2(3.4%)	2
Inadequate technical skill	58	17(29.3%)	15(25.9%)	11(19%)	7(12.1%)	8(13.8%)	7

Source: Survey Result, 2017

From the above table, the first there major problems in the order of their rank were inadequate management support (78%) and problems with contractors (78%), unrealistic deadline (74%), lack of quality management policy and strategy (69%) ranked 1st, 2nd and 3rdrespectively. However, the least ranked three challenges to project quality in the construction project surveyed were lack of regular supervision, unwillingness of project staff to accept the quality management system and lack of quality assurance team leading ranked 6th, 7th, and 8th respectively. However, the remaining considered factors were found to be affect even if the degree varies since all the listed problems affect quality of the construction.

4.9. Quality Improvement Actions

For the question whether the Bureau take any action to solve the problems related to quality management most of the respondents 36 (62.1%) agree and the rest 22(37.9%) not agree on the action taken by the Bureau. The former lists some of the actions taken includes by lessons taken from previous quality problems starting from document preparation regarding contract document prepare detailed requirements, assign resident engineers to control the quality of a project, regular supervision, discussion forum with contractors to take corrective measures depending on the level of the problems, effective communication among stakeholders, industrial material approval per quality specification at regional level before delivery to the sites and on the sites also undertake test to approve the quality (inspections, laboratory test), regular proportion and ratios inspection by resident engineer, decreasing the time that would elapse for payment facilitating in order to increase the time value of money and to resist the impact of inflations.

Lastly, respondents were asked to rate the level of the quality management of the organization in their perspectives. The following table illiterate what the quality management practices of the organization.

Table 4.11 Extent of Quality Management Practice's

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Improved	7	12.1	12.1	12.1
	Maintained	33	56.9	56.9	69.0
	Decreasing	15	25.9	25.9	94.8
	Stopped	3	5.2	5.2	100.0
	Total	58	100.0	100.0	

Source: Survey result, 2017

Accordingly about half (56.9%) of them suggest it is maintained; only 7(12.1%) considered as improved, 15(25.9%) of them it is decreasing and the rest 3 respondents (5.2%) as stopped. This may indicate that more than half of the respondents are not agree with the improvement of quality management system while the organizational construction of various projects are increasing.

Moreover, they also proposed area of improvement for proper quality management qualified personnel as critical, attitude towards quality should be improved through awareness creation and regularly document other than contract document, government list price procurement policy has effect on compromising quality of project outputs in relation with this some of the respondents noted that the Quality Control Authority should give special emphasis for imported construction materials including electrical materials capacity building staff and contractors, there should be other quality management.

4.10. Discussion

In light of the data obtained through the three data collection tools (questionnaires, interviews and documents reviews), the following major points of discussions have been identified and discussed as follows.

In this study, efforts were made to triangulate the consistency and inconsistency of the results achieved through the above mentioned data collection tools. As stated under the data analysis section, in responding to the question concerning, how project quality planned and implemented, the finding has shown partially consistent results since the plan is not prepared as separately rather the content of the plan are part of the project agreement document. The

result also stated that there is separate quality policy at organizational level but the planning process is initially based on the Ethiopian Building standard specifications and quality requirements. This finding partially seems consistent with some of the literature and various among variables.

There is no separate Quality management policy separately in the Organization unlike in the literature most studies recommend that to have separate quality policy in the organization which help as guiding principle to undertake the whole process of quality management. Kerezen(2003) described quality policy is instrumental in creating the organization's standing and quality image since it is statement of principles stating what throughout the organization and across the project and Tonnen(2002) stated that the main advantages of this approach over conventional planning systems are that it combines strategic objectives with tactical daily management, covers all functions in a company and increases quality goals' consensus.

Even though, the interview with head of Engineering and Maintenance Department in ORHB indicated that quality planning starts when specification of material is prepared based on EBCS by Ministry of Works & Urban Development, 1995. The result also stated the planning process is initially based on the Ethiopian Building standard specifications and quality requirements but lack full participation at all project plan process. Unlike Liydia (2010) description of quality planning ensure that all relevant parties involved including consultants, subcontractors and suppliers are included in the task of quality planning for the project. But the ORHB case most of the project team (62%) respond as they were not involved at all stage.

Quality management tools are important factors for the implementation of quality management in construction projects, where identification of quality standards, evaluation of overall project performance and quality control monitoring of specific project results in the quality management processes were defined by PMI (2000). In the study majority of the respondents agrees that there is performance measurement to control quality (87.9%) in primary construction project. Chang (1999) argue that, a good quality control system should have to establish the measurement methods used, compare the actual results to the quality standard to monitor and standardize measuring devices accordingly from about 10 major

factors inspection and design of experiment/laboratory test as the major tools to control quality.

Regarding quality management factors Joy (2014) stated the major factors that affect quality; material, labor, financial issues, conformance to codes and standards, top management support, management factors, selection of contractor, selection of designer design, co-operation of parties, contract documents and lack of communication. Likewise majority of the respondents identified qualified and experiences personnel (93.1%), quality of materials and equipments used in the project construction (91.4%) and conformance to specification (89.7%). Similar to Everline(2014) identified four major factors that most important determinants in general construction projects; Experience and qualification of personnel, quality of materials and equipments, conformance to specification and quality assurance training and meetings.

The result shows that the major problems identified were inadequate management support (78%) and problems with contractors (78%), unrealistic deadline (74%), lack of quality management policy and strategy (69%). Partial with the research done by Beshah (2014) stated in his Fish-bone diagram, the root causes of quality problems which contributed to weak quality management practices in Ethiopia are leadership problems, lack of policy and strategy, inefficient resources management, inefficient process management, lack of customer focus and weak business performance.

In addition to the problems which are similar with findings of other research most of the respondents and interview result showed that there are problems related with contractors limited capacity with respect to the working capital, machine and technical capacity are highly affect the quality of primary hospitals constriction projects, unwilling of some contractors to maintain quality as per the specification on the agreement. They further stated that price escalation/high inflation in the price of construction materials affects project quality in two adverse effects by delaying completion time since contractors waiting for lower prices; and negatively affecting quality of project outputs as they reduce quality to compensate cost.

Chapter 5

SUMMARY, CONCLUSION AND RECOMMONDATIONS

This chapter has three sections. The first section presents summary of major findings, the second section presents conclusion of the study derived from findings and the last section deals with recommendation that were made on basis of the findings.

5.1. Summary of the Finding

Based on the results of the study carried out the major summary of finding of the study shows that:

- ✓ ORHB has no written quality policy but they use the project agreement as standards and guidelines in addition to other government checklist for follow up project. Most of the activities identified as quality plan content on the guiding of other literature project quality document are in one way or another included in their project work and contract documents but there is no separate quality planning for construction projects.
- ✓ The overall project planning process lacks preparing with direct participation of the implementers starting from planning phases their involvement is mostly at implementation, follow up and the controlling.
- ✓ 79.3% and 75.9% of respondents were confirmed that inspection and statistical samplings is the major and laboratory test of industrial materials were the quality management tools and technique respectively.
- ✓ Qualified and experiences personnel(93.1%), quality of materials and equipment used in the project construction(91.4%) and conformance to specification(89.7%) ranked 1st, 2nd, and 3rd respectively are estimated the three most important factors in the determinant of the quality of primary hospital construction projects.
- ✓ Defining purpose of the project (91.4%) and collects reviews and controls the quality records that the supplier is conducted (93.1%) are the major variables affect quality assurance of the project.

- ✓ As most of the respondents argue that quality of the projects at organizational level seems not improved (only 12.1% agreed to improvement of quality of the project) therefore it is one of the areas of improvement for the organization.
- ✓ Inadequate management support (78%), problems with contractors (78%), unrealistic deadline (74%), lack of quality management policy and strategy (69%) are the three challenges examined organization.

In general there is no separate quality management policy in the organization unlike in the literature most studies recommend that to have separate quality policy in the organization which help as guiding to undertake the whole process of quality management. But the organization put it as part of the project contract agreement document by specifying the required quality requirements every project.

5.2. Conclusion

The study assessed the quality management practices of hospital construction projects in Oromia with the objectives set for this purpose were to The general objective of the research is to assess the quality management practices and major quality management challenges in hospital construction projects in Oromia. On the basis of the major findings of the study and as discussed in detail in the literature review part of this study, effective project management enhances the chance of successfully completing projects within time, cost and quality constraints. Project quality management also helps to achieve project constraints such as within customer satisfaction, and meeting the organizational goal of the project.

Project quality management is one of the nine core knowledge areas that project managers should be familiar and for the successful management of projects the organization has to undergo the quality management process. It involves estimating the planning process, quality assurance process, quality controlling process based on the organizational quality policy and procedure rather than only depending on project contract agreement as reference document.

Quality Management practices remain important for achieving effective project performance in construction projects to achieve social and economic developments. The quality management process is partially undergoing with limitations of considering all the steps and parameters fully under consideration since ORHB has no the guiding for designing quality management

at organizational level. Therefore, the project management process lacks standardization as per the literature on the process quality management.

Moreover, the project quality management is challenged by various factors mainly; insufficient management support, problems with contractors, unrealistic deadline and lack of quality management policy and strategy for effective quality management in hospital construction projects.

Additionally regular and periodic construction site supervision and inspection were the most important measure to improve quality of primary construction projects. The next important measure is implementing a comprehensive quality control mechanism starting from the planning phase and continuing into the end of the project implementation phases.

Therefore, it may be concluded that, undertaking complete quality management process by developing quality management policy at organizational level helps to improve the quality management related problems listed and working on the factors that affect the quality of projects.

5.3. Recommendations

Based on the findings of study it is recommended that ORHB considers the following areas of improvement in management of project in general and quality management in particular.

- The planning process needs improvements regarding to make the planning process participatory since the knowledge of the project team various on the contain, tools and techniques used in quality management to properly follow the projects they undertake in the region.
- ORHB top management should work on identifying the gaps which require their strong support and strengthen the quality focused activities since their guidance is decisive for the success of the project.
- Quality management of construction projects require stakeholders collaboration from clients and contractors sides on the basis on their respective roles and responsibilities defined. Therefore, the ORHB should strongly work on.
- Currently, there is no quality management policy document in the organization, the ORHB is considering project agreement document as reference/basis for quality

management, but there should be defined quality policy since there are many projects undertaken by the sector to improve the health status of the community.

- The regional health bureau should focus to working on the challenges identified to improve the quality of the construction project and application of the knowledge area of the project quality management.
- Assign project quality management focal person at least at regional level is important to control overall quality of the projects by application project quality management skills and knowledge.
- The ORHB should build capacity of project staff on project quality management to use qualified and experienced staffs to follow up use of good quality of materials and equipment to ensure the project conformances to specification and standard requirements.
- Provide standard project management skill and knowledge training with special focus on the quality management for project management staff at Bureau and site levels.
- The existing government contract administration and procurement rule needs revision. Especially the least price should not be the only criteria to select winners. The revision is expected to include past performance contractors, work experience, current capacity of contractors and any other relevant criteria.
- Quality Assurance authority should give attention to quality of imported construction materials.

Therefore, the bureau can make use of the results of this study to identify areas of improvements in order to manage its projects quality as per the standards of other literature which helps to manage the project in a more effective and efficient manner.

5.4. Future Studies

The practice of quality project management based on the project management skills and knowledge is in its early ages in Ethiopia and only few researches were conducted that are relevant to project management in general specially to quality management. Thus, future researches can be conducted in detail and incorporating various project based organizations to compare their project quality management practice and contribute to growth of the disciple.

Moreover, this study focused on the client and supply side of the primary hospital construction projects to assess the quality management practices and challenges related. Other study can be done incorporating quality management challenges including contractors and beneficiaries.

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APPENDICES

Appendix i. List of Primary Hospitals Construction from 2014-2016

S.No	Project Location			Yr of commencement	Contract Amount (Birr)
	Name of Primary Hospital	Zone	District/Ana		
1	Bokoji	Arsi	Limu Bilbilo	2004	29,064,284.4
2	Chancho	Arsi	Gololcha	2004	29,823,427.5
3	Balee	Arsi	Bale Gesgar	2004	34,924,029.9
4	Kersa	Arsi	Munessa	2004	26,985,040.3
5	Gobessa	Arsi	Shirka	2005	32,390,284.2
6	Sude	Arsi	Sude	2006	32,305,079.6
7	Lode Hetosa	Arsi	Lode Hetosa	2006	28,616,767.2
8	Loke	West Arsi	Siraro	2004	25,695,063.5
9	Arsi Negele	West Arsi	Arsi Negele	2005	28,617,515.6
10	Nensebo/kore	West Arsi	Gedeb Asasa	2006	29,885,952.6
11	Goro	Bale	Goro	2004	30,907,886.8
12	Gololcha/Jarra	Bale	Gololcha	2006	30,606,344.2
13	Meda Welabu	Bale	Meda Welabu	2005	31,262,384.7
14	Teltele	Borena	Teltele	2004	33,700,883.7
15	Melka Soda	Borena	Melka Soda	2005	29,681,587.8
16	Megga	Borena	Dire	2005	31,648,637.0
17	Arero	Borena	Arero	2006	31,415,097.3
18	Uraga	Guji	Uraga	2004	32,678,638.4
19	Kercha	Guji	Kercha	2004	30,099,633.5
20	Bore	Guji	Bore	2005	30,917,337.0
21	Seba boru	Gujii	Seba boru	2006	31,930,947.3
22	Chelenko	East Hererge	Metta	2004	29,199,715.2
23	Bedeno	East Hererge	Bedeno	2004	32,602,723.9
24	Gursum	East Hererge	Gursum	2005	32,558,287.4
25	Melka Bello	East Hererge	Melka Bello	2005	35,156,351.8
26	Midega Tola	East Hererge	Midega Tola	2006	35,001,249.5
27	Kumbi	East Hererge	Kumbi		34,993,350.7
28	Hirna	West Hererge	Tulo	2004	32,993,605.7
29	Bedessa	West Hererge	Oda-Bultum	2004	29,954,762.5
30	Asebot	West Hererge	Mi'eso	2004	32,372,037.2
31	Daro Lebu/Mechara	West Hererge	Daro Lebu	2005	28,909,729.0
32	Burka Dimtu	West Hererge	Burka Dimtu	2006	35,348,989.6
33	Darimu	Ilubabor	Darimu	2004	32,031,136.9

34	Dedessa	Ilubabor	Dedessa	2004	30,078,994.0
35	Chora	Ilubabor	Chora	2005	31,628,014.2
36	Chewaka	Ilubabor	Chewaka	2006	32,583,921.2
37	Asendabo	Jimma	Omo Nada	2004	34,408,550.6
38	Seka Chokorsa	Jimma	Seka	2004	34,124,499.3
39	Dedo	Jimma	Dedo	2004	32,993,605.7
40	Setema	Jimma	Setema	2005	35,460,151.6
41	Limu Seka	Jimma	Limu Seka	2006	37,128,907.0
42	Tiro Afeta	Jimma	Tiro Afeta		34,957,612.8
43	Wolenchiti	East Shoa	Boset	2004	32,314,143.6
44	Modjo	East Shoa	Lume	2005	26,566,430.5
45	Dugda	East Shoa	Dugda	2006	33,944,844.8
46	Gundo Meskel	North Shoa	Derra	2004	29,154,473.8
47	Muka Turi	North Shoa	Wuchale	2005	28,521,848.3
48	Kimbibit	North Shoa	Kimbibit	2006	35,437,055.7
49	Godjo	West Shoa	Jeldu	2004	31,376,910.5
50	Inchinni	West Shoa	Ade'a Berga	2004	30,790,316.2
51	Dendi	West Shoa	Dendi	2006	32,911,309.3
52	Bako	West Shoa	Bako Tibe	2005	33,975,840.5
53	Gindo	South West Shoa	Ameya	2004	32,993,605.7
54	Leman	South West Shoa	Kersa Malima	2004	28,828,268.2
55	Bantu	South West Shoa	Tole	2005	26,922,343.7
56	Arjo	East Wollegga	Jima Arjo	2004	34,709,283.1
57	Sire	East Wollegga	Sibu Sire	2005	33,594,430.1
58	Abe Dongoro	Horro Guduru Wollegga	Abe Dongoro	2004	32,993,605.7
59	Guduru	Horro Guduru Wollegga	Guduru	2005	34,968,791.8
60	Mendi	West Wollegga	Mene Sibu	2004	31,519,932.4
61	Bubbe	West Wollegga	Nole Kaba	2005	30,069,991.7
62	Genji	West Wollegga	Genji	2006	36,700,172.6
63	Kake	Kellem Wollegga	Dale Wabera	2004	31,490,111.9
64	Gidami	Kellem Wollegga	Gidami	2004	31,914,929.9
65	Hewa Gelan	Kellem Wollegga	Hewa Gelan	2005	30,917,337.0
66	Chancho	OSZSF	Sululta	2004	30,821,035.5
67	Sendafa	OSZSF	Sendafa Berh	2005	28,271,757.6
68	Holota	OSZSF	Welmera	2006	25,656,357.2

Appendix ii: Questionnaire

St.Mary's University
Project Management Department
M.A thesis on Project Management

Dear respondent,

The purpose of this questionnaire is to collect data on Assessment **of Quality Management Practices of Hospital Construction Projects in Oromia** conducted for partial fulfillment of Masters of Art in project Management.

Believing that your frank and genuine responses will contribute vastly to the quality of the findings of this study, I would like to request you kindly to complete this questionnaire which will be kept confidentially for the study purpose.
I would like to express my heartfelt thanks in advance for taking part in this endeavor.

Anane Miressa Gamtessa 0911347310 or ananemir@yahoo.com

Part I. General Profile

Please put a "√" mark to all your responses in the circle provided beside each statement.

1. **Gender**

☐ Male ☐ Female

2. Education background

☐High School completed ☐ College diploma

☐Bachelor degree ☐ Masters Degree or above

3. Which of the following best describes your role in the Hospital construction project?

☐ Project Manager ☐contract administration team ☐Project Consultancy

Variable	Yes	No	Comment

☐ Resident engineer ☐ Technical Team member ☐Project supervisor ☐ Other_____

4. Total Work Experience

☐ Less than 5 years ☐ 6-10years ☐ 11-15 years ☐ 16 and above

5. Organization: _____

Part II-

This part of questionnaire covers Quality management practices, Quality control tools and challenges in hospital construction project in Oromia.

A. Quality Management & process

1. Is there quality management policy in your Organization? ☐ 1.Yes ☐ 2. No
2. Have you participated in the primary hospital project designing process before implementation starts? ☐ 1.Yes ☐ 2. No
3. If yes at which stage? ☐1.Planning □ 2. Implementation ☐3. Controlling ☐4. All stage
4. Does the process involve quality management? ☐ 1.Yes ☐ 2. No
5. If yes at which stage? ☐1. Planning □2. Implementation ☐3. Controlling ☐4. All stage
6. Does your quality plan contain the following?

Brief description of project			
List of contract documents and drawings			
Project quality objectives			
Site organization chart, with named personnel if known			
Responsibilities and authorities of project staff			
construction programme and sub-programmes;			
schedules of subcontractor nomination, material and equipment			
procurement, based on the construction programme;			
list(s) of materials and appliances used for the project, showing the verification requirement of each;			
Inspection and test plans, or list thereof;			
list of quality procedures and work instructions applicable to project—by making reference to the company's Quality Manual and Procedures;			
list of project-specific procedures, work instructions and inspection			
checklists, or target dates for their provision;			
list of quality records to be kept, including pertinent quality records from subcontractors;			
frequency (or provisional dates if possible) of internal quality audits;			
Frequency of updating the quality plan.			

7. How important do you think the quality management plan is to your constriction projects?

☐1.Very low ☐2. Low ☐3. Moderate☐ 4. High ☐5. Very high

B. **Quality Management Tools and Control**

8. Is there a way to measure actual performance? ☐ 1.Yes ☐ 2. No

9. Do you use any quality management tools? ☐ 1.Yes ☐ 2. No

10. If yes, which method you use in your primary hospital construction project?

No.	**Which Quality tools used at hospital construction projects?**	**1. Yes**	**2.No**	**Comment**
1	Benefit Cost Analysis			
2	Benchmarking			
3	Flow-charting			
4	Design of Experiments			
5	Quality Audits			
6	Control Charts			
7	Inspection			
8	Pareto Diagrams			
9	Statistical Sampling			
10	Trend Analysis			
11	Any other Quality tools? Please mention			

11. Do you take action to adjust the process if necessary? ☐ 1.Yes ☐ 2. No

12. Please express your opinion on the following quality management factors that affect performance of construction projects;

The scale rating description: 5 = very strongly Agree, 4= strongly agree, 3= moderately agree, 2= slightly Disagree, 1= strongly Disagree

S.no	**Quality Factors**	**Rating**				
		5	**4**	**3**	**2**	**1**
1	Qualified and experienced personnel					
2	Quality of materials and equipments used in the project construction					
3	Conformance to specifications					
4	Quality assurance training and follow up					
5	Top management support					
6	Contract documents					
7	Selection of contractor					
8	Co-operation of stakeholders					
9	Others please specify					

C. <u>Quality Assurance</u>

13. Is the purpose of the projects defined in the first instance? ☐ 1.Yes ☐ 2. No
14. Do you consider the following factors in your quality assurance mechanism ?

(a) Selects the appropriate quality system requirements for each contract.☐ 1.Yes ☐ 2. No

(b) Clearly specifies the quality system requirements in tender and contract documents. ☐ 1 Yes ☐ 2.No

(c) Evaluates and selects subcontractors on their ability to satisfy specified requirements. ☐

1.Yes ☐ 2. No

(e) Monitors the works and the implementation of the quality system. ☐ 1.Yes ☐ 2. No

(f) Collects, reviews and controls the quality records that the supplier is contracted to

provide. ☐ 1.Yes ☐ 2. No

D. Quality Management Challenges

15. What are the main challenges and obstacles of quality management in primary hospital construction projects in your opinion?
Description: 5 = very strongly, 4= strongly, 3= Moderate, 2= Less, 1= very less

No.	**Quality management problem encountered?**	**Rating**				
		5	**4**	**3**	**2**	**1**
1	In adequate management support					
2	Lack of quality management policy and strategy					
3	Inefficient resources management					
4	Lack of regular supervision					
5	Unwillingness of project staff to accept the quality management system					
6	Lack of quality assurance team leading the process					
7	Problems with Contractors					
8	Lack of effective communication					
9	Increase of cost					
10	Unrealistic deadline					
11	Inadequate technical skill					
12	If any other please mention					

16. Does the Bureau solve these challenges?

☐ 1.Yes ☐ 2. No

17. If yes in what ways the organization solved these challenges? Please list mechanism

_____
_____
_____

18. How the organization's quality management practice look like?

1. It is improved ☐ 2. It is maintained ☐ 3.It is decreasing ☐ 4. It is stopped

2. Other, Please specify_____

Additional Comments:

1……
2……
3……

Appendix iii: Key Informant Interview Guide

1. Would you tell me your current position in your organization, level and type of your education and experience on project management?
2. What is your general experience in your organization in project implementation and management with reference to time, budget and quality of outputs?
3. Do you have project quality management system in your organization?
4. What are the policy and procedure of ORHB concerning quality?
5. Do you have a quality manager separately? What are the major responsibilities? Or Do other departments participate on the preparation of the quality plan? Other department staff responsible for contracts, purchasing, logistics, etc.
6. How do you control the quality of material and work? Who is responsible?
7. Does OHB team conduct regular supervision? How frequent?
8. Do you have training on project management? Especially on project quality management?
9. How do you see management commitment and priority for project Quality implementation and management?
10. How are projects quality maintained? What are the measures you take to control quality of projects?
11. How and in what ways are project quality related issues communicated?
12. What are the challenges you face in project quality implementation and management in your primary hospital construction?
13. What do you think must be fulfilled for successful project quality implementation and management in general?