

**PROJECT IMPLEMENTATION PRACTICE IN ETHIOPIAN  
TELECOMMUNICATIONS CORPORATION: THE CASE OF  
RURAL CONNECTIVITY PROJECT**

**Prepared by: Habtamu Fantaye**

**Advisor: Teferi Regassa(Asst.Prof.)**

~~The~~ Thesis Submitted to the School of Graduate Studies of Addis  
~~Ababa~~ Ababa University in Partial Fulfillment of the Requirements for the  
Masters of Public Administration in the Department of Public  
Administration and Development Management

Addis Ababa, Ethiopia

July 2008

ADDIS ABABA UNIVERSITY  
SCHOOL OF GRADUATE STUDIES

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## Abstract

*In order to achieve any organizations' project targets within the estimated time and cost, an efficient project implementation is essential. Efficient project implementation practice ensures the organization controls costs in such away that projects proceed in line with the plan and the budget. It also aids in making decisions that will enable the organization to achieve or exploit a strategic competitive advantage. The general objective of the research is to improve the project implementation practice in ETC to make appropriate decisions on time and in a cost effective manner because proper project implementation is mandatory for the organization as it invests large amounts of capital in its project activities. To achieve this objective, the researcher utilized experiences of concerned ETC staff (staffs of RCP, Cost, PMC, and Procurement) by conducting interviews, analyses of records and secondary data exploration. In this research, a case study research design (i.e. Rural Connectivity Project) was considered useful as it was envisioned to lead to detailed illustration, insight, discovery and interpretation of the research findings. A number of problems have been observed in ETC's project time management, in the project communication, in the project cost estimation, and generally in the project implementation practice. To overcome these problems the researcher has presented valuable recommendations for future improvements. As the result, the study will contribute towards an efficient project implementation practice that would enable the organization to implement its projects within the targeted cost and time.*



## **Acknowledgement**

This research paper has been accomplished with the help of various individuals and institutions without whom it could not have materialized. Therefore, I want to take this opportunity to acknowledge all those who, directly or indirectly, contributed to the realization of this research paper.

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## Acronyms

|      |                                                   |
|------|---------------------------------------------------|
| ABC  | – Activity Based Costing                          |
| ACWP | – Actual Cost of Work Performed                   |
| ADLI | _ Agricultural Development Led Industrialization  |
| AICI | _ African Information Society Initiative          |
| BAC  | – Budget at Completion                            |
| BSC  | - Base Station Center                             |
| BTS  | - Base Terminal Service                           |
| BCWP | – Budgeted Cost of the Work Performed             |
| BCWS | – Budgeted Cost of the Work Scheduled             |
| CEO  | – Chief Executive Officer                         |
| CER  | – Cost Estimation Relationship                    |
| CPM  | _ Critical path method                            |
| ETA  | _ Ethiopian Telecommunication Authority           |
| ETC  | – Ethiopian Telecommunications Corporation        |
| EV   | _ Earned Value                                    |
| FOB  | – Free On Board                                   |
| GERT | _ Graphical Evaluation and Review technique       |
| GSM  | _ Global System for Mobile Communication          |
| GTC  | _ Grameen Telecommunications                      |
| IBTE | _ Imperial Board of Telecommunication of Ethiopia |



ICT \_ Information Communication Technology

ITU \_ International Telecommunication Union

MCT \_ Multi-purpose Community Center

PERT \_ Program Evaluation and Review Technique

PLANET \_ Project Length Analysis and Evaluation Technique

PMBOK \_ Project Management Body of Knowledge

PMC \_ Project Management and Control

PMI \_ Project Management Institute

PMOs \_ project Management Offices

RCP \_ Rural Connectivity Project

SBU – Strategic Business Unit

TOR \_ Terms Of Reference

TVRO \_ Tv Rebroad Services Receivers

VP - Village Phone

VSAT - Very Small Aperture Terminal

UPTC \_ Uganda Post and Telecommunications Corporation

UTL \_ Uganda Telecom Limited

WBS – Work Breakdown Structure

WIP – Work In Progress

WTO \_ World Trade Organization

ZTE \_ Zhongxing Telecommunications Equipment

# *Chapter One*

## INTRODUCTION

### 1.1. General

Universal access refers to the scenario in which everyone in a community can gain access to a publicly available telephone, although not necessarily in their homes, which is the goal of universal service (ITU, 2003: 15).

#### 1.1.1. Concept and Definition of Universal Access

The history of universal access is linked with the Maitland report officially titled the 'missing link' in 1984. This report coined the term "missing link" for the Telecommunications infrastructure in developing countries. The missing link, which highlighted the growing inequalities of Telecommunications resources between developed and developing nations also went further in finding the missing link between the wealth within a given society and the poor: those who live in rural areas and those who live in urban areas (ITU,2003: 29).

The definition varies from country to country and the level of development of the telecommunications network. In this regard, the WTO's Reference Paper on Telecommunications Services (ITU, 2004; 33) states that:

*'Any member has the right to define the kind of universal service obligation it wishes to maintain. Such obligations will not be regarded as anti-competitive per se, provided they are administered in a transparent, non- discriminatory and competitive neutral manner and are not more burden some than necessary for the kind of universal service defined by the member'.*



Universal access was originally defined as the availability of a public fixed tele phone at a walking distance (ITU, Trends in Telecommunications reform, 2004: 32). But with the technological development in ICT universal access has now come to mean community access to both old and new ICT in a location that is convenient to the majority of the population. It is expanding gradually to include Internet, mobile, tele centers and other ICT services.

Universal Services can be defined as making service available individually to every household. ITU (2003: 58). This is more practical in developed countries than in developing countries.

### **1.1.2 Objectives of Universal Access Policy**

Governments promote and implement universal access policies and programs in an attempt to attain several key goals (ITU,2003: 30). These are:

- The promotion of economic productivity and growth.
- The promotion of political and social cohesion through the integration of isolated communities into mainstream society.
- The improvement of delivery of government services and, the elimination of economic and social disparities between the “information rich” and “the information poor”.

According to Project Management Document (ETC,2006a: 4), the universal access definition for the Rural Connectivity Project in Ethiopia is “Access to Basic Telephony and ICT services in one package with scalability options to cater for future expansion requirements.” In the Ethiopian context the main project to achieve this is through establishing “Tele Centers”.

The Government of the Federal Democratic Republic of Ethiopia has been operating under the guidelines of its Agricultural Development Led industrialization (ADLI)

policy. This strategy is based on the belief that national development could only be achieved if rural communities play a role and are made beneficiaries of this process. It is agreed that one of the necessary inputs required for successful implementation of the various projects and programs included in ADLI is access to basic communications facilities in these rural localities. Ethiopian Telecommunications Corporation (ETC), as the sole telecom service provider in the country, holds the responsibility of addressing this issue. Recently, in line with national ICT dissemination, ADLI and poverty reduction strategies, the government and ETC have agreed on the need to provide nationwide communications coverage at “*Kebele*” level through a nationwide Rural Connectivity Project (RCP). The first phase of this project, which covers 5000+ of the estimated more than 15,000 “*kebeles*”, is planned to be operational in 1997 EFY with the remaining 10,000+ to follow in 1998 ETC (2006a: 4)

One of the drawbacks to the Rural Connectivity Project, being a huge project in terms of aims and budget, is there exists no identified formal research on this topic within the Ethiopian Telecommunications Corporation. Therefore, this study aims to fill this gap.

## **1.2. Statement of the Problem**

A project is a complex of economic activities in which scarce resources are committed in the expectation of benefits that exceed the costs. Projects are unique, have a specific deliverable, specific due date.

Projects are formed in order to fix responsibility and authority for the achievement of an organizational goal on an individual or small group when the job does not clearly fall within the definition of routine work. Projects have become recognized as a valid way of working not just in the traditional industries such as engineering, defense, and construction, but in every corner of the private, public, and even voluntary sectors.

Every organization of all sizes expends much of its energy on projects. Since the late 1990s, project management offices (PMOs), have been proposed as solutions to ensure

that projects stay on course and ultimately contribute to an organization's well-being and prosperity( Paul &Terence,2006: 7).

The Project Management Institute's PMBOK Guide lists nine areas of knowledge that a project management team needs to manage: time, cost, scope, quality, human resources, communications, risk, procurement, and integration. In the folk wisdom of project management, conducting the project is about managing time, cost, and quality: if the project is completed on schedule and adheres to cost and quality constraints, it can be declared a success(ibid: 11).

For many years Ethiopian Telecommunications Corporation conducted several projects using functional units responsible for the overall performance of different activities in the project. But in recent years ETC is using the matrix project organization for few numbers of projects. The rural connectivity project is one organized in such a manner.

ETC, the sole telecom operator in the country, in its strategic plan ETC (2006: 15) has targeted to provide basic telephone access to 15,000 rural *kebeles* to 100 per cent of population within 5 km of walking distance by the end of 2000 EFY. The incumbent telecom operator begin providing the access to the *kebeles* in 1998 EFY. Currently, ETC is capable of providing access to only 6972 rural *kebeles according to local newspaper Addis Zemen* (2007: 4). Thus, this trend indicates that ETC may not meet the target according to the plan.

The rural connectivity project faces various difficulties. It is poorly managed for the following reasons. As we have seen from the goal of the project in phase 1 (completed by the end 1997 EFY) end user installations for 5000 tele centers and four public office telephone per *kebele* is to be conducted. In the same fiscal year, site selection and designing for phase 2 of the project that addresses the remaining 10,000 sites is to be deployed in 1998. However, the project has not been completed within the time-frame. So far the project has established only 7000 tele-centers in the past four years, less than

half of the goal. The sites where tele-center established are not known in advance. The tender and the delivery of the goods were being delayed due to various reasons.

The regional offices that implement the project have not taken the project as their own, which led to miscommunication between the project office and regional offices. The status of the project is moreover not clear at present. The project has not been concluded formally; rather the project came to be an ordinary function of one department. Handover meetings in the execution phase are not conducted.

Due to the above problems the rural connectivity project could not achieve what it set out to accomplish. The project coverage is less than half of the total planned coverage, negatively impacting corporation revenue. Until recently, there was no collection mechanism. Due to this failure the corporation has lost significant amount revenue. Therefore, the study shall pose the following critical questions:

- 1) To what degree of success was the monitoring and controlling of project schedule carried out?
- 2) Where were the shortfalls in processes of both estimating and controlling project costs?
- 3) Was the communication process among different stakeholders successful while implementing the project?

### **1.3 Objectives of the Study**

The objectives of the study will be:

- To assess the performance of monitoring and controlling of project schedule.
- To assess and identify bottlenecks in the process of both estimating and controlling of project costs.

- To assess and identify the problem of communication processes among different stakeholders while implementing the project.
- To suggest possible solutions that improves the project implementation practice in Ethiopian Telecommunications Corporation.

## **1.4 Significance of the study**

Projects utilize significant amounts of resources. Appropriate implementation of projects is necessary in order to effectively and efficiently utilize these resources. Through project management proper use of resources can be obtained. The result of this study therefore will help project managers to bring best practices of project management in the implementation phase to ETC through the identification of the strengths and weaknesses of existing project management practice. This study will also be a stepping –stone for further research in the area of project management.

## **1.5 Methodology of the Study**

This study is a single type case study in which only one project is selected for the research project purpose and the analysis is solely based on this single project. The project was purposefully selected.

To have a clear understanding of the problem, qualitative descriptive method of research design is selected and in some cases quantitative analysis will also be used. The required data are collected through primary and secondary sources. Primary sources encompass semi-structured interviews in order to focus attention on a given issue and to get detail information. The interview respondents are all project office employees: RCP program manager; project regional office coordinators, administrative workers and other concerned office employees.

For secondary data collection the following documents are used: project management, project proposal document, project progress report, project status report, meeting minutes, separate work order document, local transfer request document project management and support division, corporate planning and business development and tender documents.

## **1.6 Scope and Limitation of the Study**

Due to time constraints, the data collection is mostly limited only to the rural connectivity project office at the head office level. However, data from regional offices is collected through telephone interviews with regional coordinators.

The study is limited to the use of purposive sampling method since some project participants have left the organization due to various reasons.

Since obtaining of data from participants is based on voluntary bases, data may be missed from non-voluntary ones. The researcher tries to fill the gap through examining different documents of the organization.

The impact of social, economic, and political conditions of the country in general and the recently introduced corporate reform program in particular are not considered or are beyond the scope of this project.

## **1.7 Organization of the Study**

The research paper is organized into five chapters. Chapter two covers the theoretical framework and relevant experience of other countries. Chapter three deals with the current project management practices and performances of ETC. Chapter four focuses on discussions and findings of the research. The final chapter is devoted to conclusions and recommendations.

## *Chapter Two*

### **2. Theoretical Framework and Relevant Experience Experience**

#### **2.1 Theoretical Framework**

##### **2.1.1 Introduction**

Projects are crucial to organizational survival and prosperity, and this fact calls for upper management to focus on the projects that are essential for implementing the company's strategic plans. Due to this fact, the past several decades have been marked by a rapid growth in the use of project management as a means by which organizations achieve their objectives ( Meredith et al,1995: 1).

To put projects into perspective, you need a definition and a common starting point. All too often people call any work they have to do a "project" while projects actually have a specific definition. If a set of tasks or work to be done does not meet the strict definition, then it cannot be called a project.

According to the project management body of knowledge (PMBOK) a project is a temporary endeavor undertaken to create a unique product or service. **Temporary** means that every project has a definite end. **Unique** means that the product or service is different in some distinguishing way from all similar products or services (Burke 2004: 2).

According to Lewis (2002: 11) projects are different from standard business operational activities as they:

- Are unique in nature: They do not involve repetitive processes. Every project undertaken is different from the last, whereas operational activities often involve undertaking repetitive (identical) processes.

- Have a defined timescale: Projects have a clearly specified start and end date within which the deliverables must be produced to meet a specified customer requirement.
- Have an approved budget: Projects are allocated a level of financial expenditure within which resources can be adjusted up or down by management.
- Have limited resources: At the start of a project an agreed amount of labor, equipment and materials are allocated to the project.
- Involve an element of risk: unfortunately things seldom go according to plan because the project must adapt to a dynamic environment. It focuses on identifying, analyzing and developing strategies for responding to project risk efficiently and effectively.

In general, a project is a multi-task job that has performance, time, and scope requirements and that is done only one time. Projects follow a clear life cycle from a conceptual phase to termination phase. A project should have definite starting and ending points (time), a budget (cost), a clear defined scope or magnitude of work to be done, and a specific performance requirement that must be met. (ibid: 12). In order to understand project management, one must begin with the definition of a project. That is why we define what a project is. In the next section we try to define briefly what project management is.

### **2.1.2 Project Management**

From the time humans first worked together to build a shelter or cultivate a crop, there have been projects and project management. Project management is not new. The pyramids and aqueducts of antiquity certainly required the coordination and planning skills of a project manager yet it has been only since World War II that

formal project management discipline has emerged. During and immediately after the war, the U.S. government was engaged in enormous weapons development projects. Much of “modern” project management was defined in the 1950s, on the major cold war defense programs. The Manhattan project, in which the first atomic bomb was designed and built, is generally recognized as the first project to use modern project management techniques (Verzuh, 1999: 5).

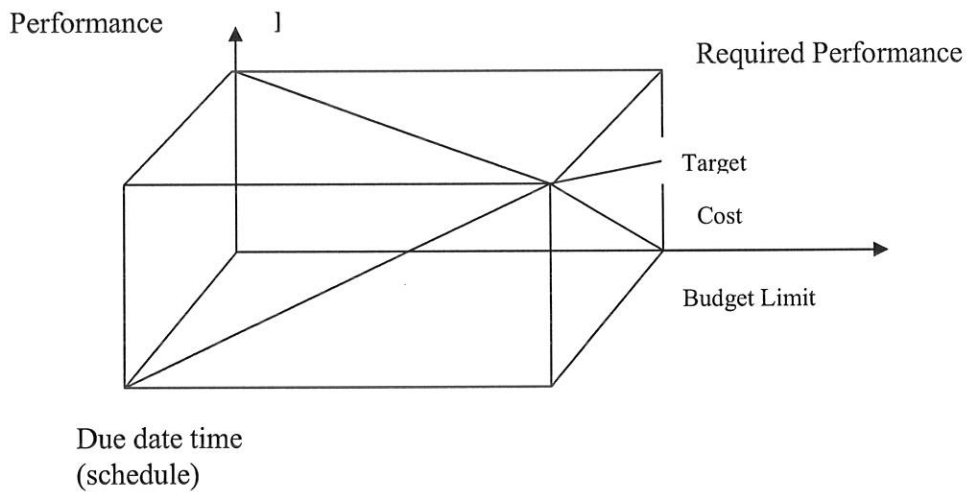
However, quite often, people misunderstand the concept of project management. Project management can mean different things to different people. Some of the definitions are listed as follows:

The Project Management Institute (PMI), the leading certification body for project management, defines project management as: The application of knowledge, skills, tools and techniques to project activities to meet project requirements. Forsberg et al (2005: 5). This is not the only definition of project management. Burke (2004:3) also defined the concept in the following manner:

*‘Project management is the most efficient way of introducing change achieved by: Defining what has to be accomplished, generally in terms of time, cost and various technical and quality performance parameters; Developing a plan to achieve these and then working this plan, ensuring that progress is maintained in line with these objectives; Using appropriate project management techniques and tools to plan, monitor and maintain progress; and Employing persons skilled in project management-including normally a project manager-who are given responsibility for introducing the change and are accountable for its successful accomplishment.*

The prime objectives of project management are shown in Figure 1, with the three specified project objectives on each of the axes. Although the functions vary from project to project, and from time to time for a given project the primary task of the project manager is to manage these trade-offs.

**Figure 1: Performance, Cost, time Project target**



*Source: Project Management – A Managerial Approach. Meredith and Mantel (1988: 3)*

Projects, project management, and project methodologies are common terms in today's business environment. Over the past few decades project management has become one of the fastest growing professions in the world. Up to 4.5 million people in the United States and approximately 12 million additional people worldwide view project management as their profession of choice. The project management institute (2000) estimates that the US public and private sectors spend some \$ 2.3 trillion on projects( Means & Adams,2005: 6).

Project management is a multi-faceted discipline. It will usually involve project scoping, task planning and scheduling, resource planning and workforce management, budgeting and cost control, risk and contingency management, change management, and project closeout. And while doing this, it is necessary to apply skills in maintaining quality, avoiding scope creep, and managing extensive and sensitive communication, with numerous stakeholders, in widespread locations (ibid: P.7).

According to Burke (2004: 3) the discipline of project management can be described in terms of its component processes, conveniently defined by the PMBOK as nine knowledge areas:

- |               |                             |                 |
|---------------|-----------------------------|-----------------|
| - Integration | - Scope                     | - Communication |
| - Time        | - Cost                      | - Procurement   |
| - Quality     | - Human Resource Management | - Risk          |

The whole process of defining the work and developing and tracking schedules, resources, and costs falls under the general heading of planning and control. Thus far the discussion has focused on what project management is. See the following section will highlight project life cycles.

### **2.1.3 Project Life Cycles**

Every program, project, or product has certain phases of development. A clear understanding of these phases permits managers and executives to better control total corporate resources in the achievement of desired goals. The phases of development are known as life-cycle phases. However, the breakdown and terminology of these phases differ, depending upon whether we are discussing products or projects ( Kerzner ,1984:71)

The project life-cycle and the work breakdown structure (WBS) have come to the forefront in recent years as key frameworks or structures for subdividing the project's scope of work into manageable phases or work packages. Where the WBS is a hierarchical subdivision of the scope of the work, the project life cycle subdivides the scope of work into sequential project phases.

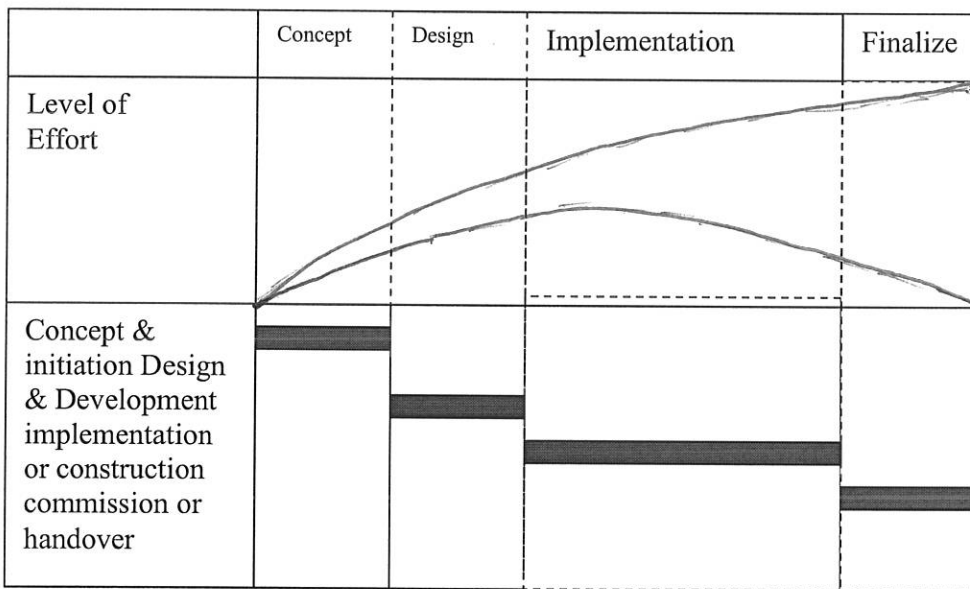
The PMBOK states: 'because projects are unique and involve a certain degree of risk, companies performing projects will generally subdivide their projects into several project phases to provide better management control. Collectively these project phases are called the project life-cycle(Burke, 2004: 28)

Project life cycle is the sequence of phases through which the project will evolve. Different authors classify project stages or phases as follows ( Turner & Simister , 2004: 12).

- Proposal, initiation & feasibility
- Definition, appraisal & strategic planning
- Implementation & control
- Finalize and close out, testing, commissioning handover proposal.

Before moving on to a detailed discussion of the paper’s main concern, project implementation and control, a brief discussion of each phase helps us for clarity purposes.

**Figure 2 – Project & Life Cycle (this is a typical presentation showing bar chart, project phases, level effort and rate of expenditure.)**



Source: *Project Management– Planning and Control techniques, 4th edition. Burke (2004:29).*

Project life cycle is the sequence of phases through which the project will evolve. The researcher defines each step briefly in the next section.

## **Proposal, Initiation & Feasibility**

This is the first phase in the project. In this phase a business problem (or opportunity) is identified and a business case which provides various solutions options is defined. A feasibility study is then conducted to investigate the likelihood of each solution for addressing the business problem and a final recommended solution is put forward. Once the recommended solution is approved, a project is initiated to deliver the approved solution. A 'Terms of Reference' is completed, which outlines the objectives, scope and structure of the new project, and a project manager is appointed. The project manager begins recruiting a project team and establishes a project office environment. (Project Management Guidebook, 2003: 4).

After identifying and responding to a problem or opportunity, the project idea will continue to the definition, appraisal and strategic planning stage.

## **Definition, Appraisal & Strategic Planning**

Once the scope of the project has been defined in the Terms of Reference, the project enters the detailed planning phase. According to project management guidebook (2003:6) the planning phase involves the creation of:

- Project plan (outline the activities, tasks, dependencies and timeframes).
- Resource plan (listing the labor, equipment and materials required).
- Financial plan (identifying the labor, equipment and material costs).
- Quality plan (providing quality targets, assurance and control measures)
- Risk plan (highlighting potential risks and actions taken to mitigate them).

After analyzing the problem or opportunity fully and the planning phase is completed. The project idea will come to the next phase. That is an implementation phase.

## **Implementation & Control**

The work of the project is planned in great detail. (Detail design and planning can not be done until finance is obtained). The work is undertaken. Progress is monitored and if performance is diverting from plan, corrective action is taken. (Project Management Guidebook ,2003: 9).

After the project comes into action, the project will enter the final stage. That is the closing stage.

### **Finalize and Close Out, Testing, Commissioning Handover Proposal**

Project closure involves releasing the final deliverables to the customer, handing over project documentation, terminating supplier contracts, release project resources and communicating the closure of the project to all stakeholders. The last remaining step is to undertake a post implementation review to quantify the overall success of the project and list any lessons learnt for future project (Project Management Guidebook, 2003: 12).

After having laid out each specific component of project life cycles, the discussion will now turn towards project implementation and control in detail.

#### **2.1.4 Project Implementation and Control**

According to David (2003: 775) ineffective project management frequently causes project problems. As a result projects are late and project costs exceed expected values. Practically, project management helps to solve the following tasks: initiate projects basing on reliable estimates of future benefits, create project schedules and budgets that optimize limited resource usage, develop an optimal plan for project financing and supplies, improve project stakeholders communications, organize proper project performance management and contract administration, and analyze project risk and uncertainties and to create contingency plans and reserves.

For the success of projects, project controlling and monitoring in the implementation phase of the project is important. There are various approaches to the definition and assessment of project success criteria, and to the categorization and appraisal of potential reasons for project failure. According to Cicmil (2000: 554) the following two are among these potential reasons for project failure:

- a) Bounded rationality in the process of project planning and project implementation and the lack of appreciation of dynamics and change; and
- b) Poor monitoring and control during the project implementation phase, leading to the measurement and assessment of project progress against its goals and constraints.

A project control system is simply a tool for the project manager. It enables recognition of problems before they become unsolvable. The essence is that it integrates the actual work to be done with the cost of doing the work and the time needed to do it. Control should be exercised over what is important. Thus, if budget and schedules are emphasized to the exclusion of quality, only those will be controlled. The project may well come in on time and within budget, but at the expense of quality (Lewis, 2002: 7). A control system should focus on response if control data do not result in action, then the system is ineffective. That is if a control system does not use deviation data to initiate corrective action, it is not really a control system but simply monitoring system (Ducan, 1993: 5).

The importance of delivering all project commitments on or before the promised dates should be obvious. A project is unlikely to be considered successful if it is completed later than the time agreed between the project contractor and the project owner. Therefore, project progress needs monitoring and control in the implementation phase. But, if any of the following conditions are not met, progress will be difficult or impossible to manage effectively.

The key things to be planned, monitored and controlled are: time (schedule), cost (budget), and performance (specification). These encompass the fundamental objectives of the project. Unless the project manager has a smoothly operating monitoring and control system, it will be difficult to manage the project effectively. It is also useful to construct this process as an internal part of the organizational structure of the project, not something external to and imposed on it or worse in conflict with it (Rosenau,1998: 45).

The monitoring system is a direct connection between planning and control. If the system does not collect and report information on some significant element of the plan, control can be faulty or missing (Meredith & Mantel,2001: 254).

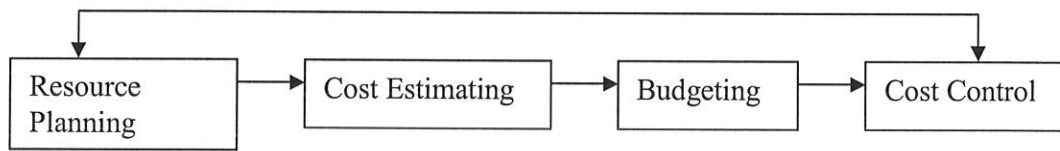
A project is seen to be composed of five elements that require managing and controlling throughout the entire life cycle: time, cost, quality, scope and resources.

Among these elements for the purpose of this study we give elevated emphasis for cost, time and communication. Hereafter project cost management, project time management and project communication are discussed in sequential order.

### **2.1.5 Project Cost Management**

Project cost management begins long before a project starts. Much of the activity often described as cost control or cost management is really nothing more than historical cost reporting, carried out too late to have any effect on costs that have already been incurred or committed (Turner & Simister,2004: 293). The following figure shows the project cost management process from the beginning to its close -out.

**Figure 3: Project Cost Management Processes**

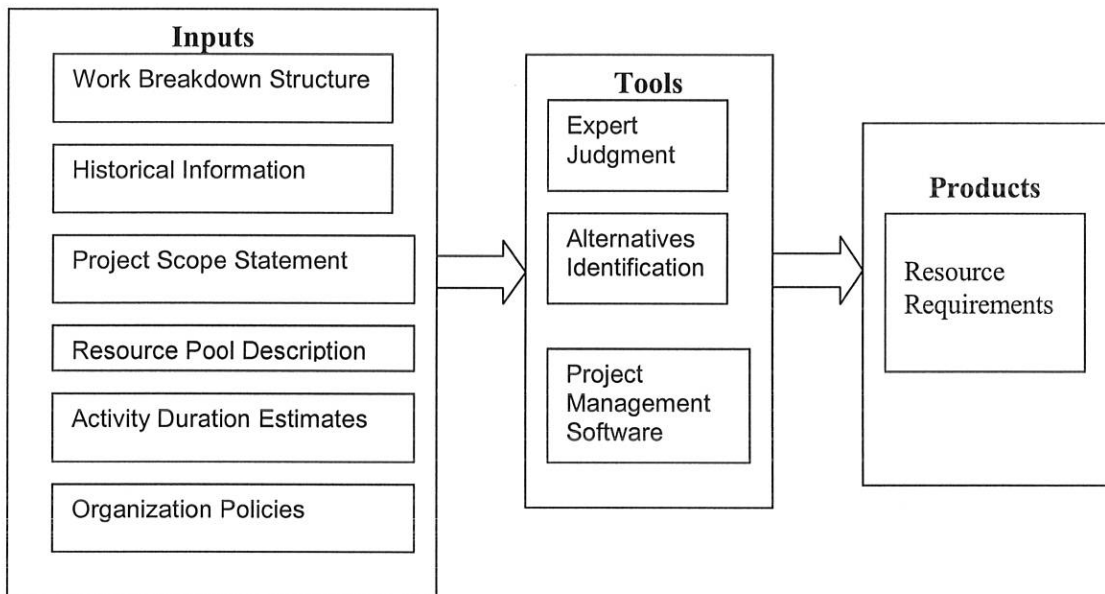


*Source: Cost Management Condensed Handbook, 2003*

### **A) Resource Planning**

The first three cost management processes depicted in figure 3 are completed, with the exception of updates, during the project-planning phase. The final process, controlling costs, is ongoing throughout the remainder of the project. Planning the resources that will be used to implement the project begins cost management. Figure 4 shows the inputs, tools, and product of this process. Analyzing the deliverables described in the Work Breakdown Structure (WBS) identifies all the tasks needed to achieve the project goals. It is important to get experienced people involved with this activity, as noted by the expert judgment listed under 'Tools'. They will know what works and what doesn't work.

**Figure 4: Resource Planning Elements**



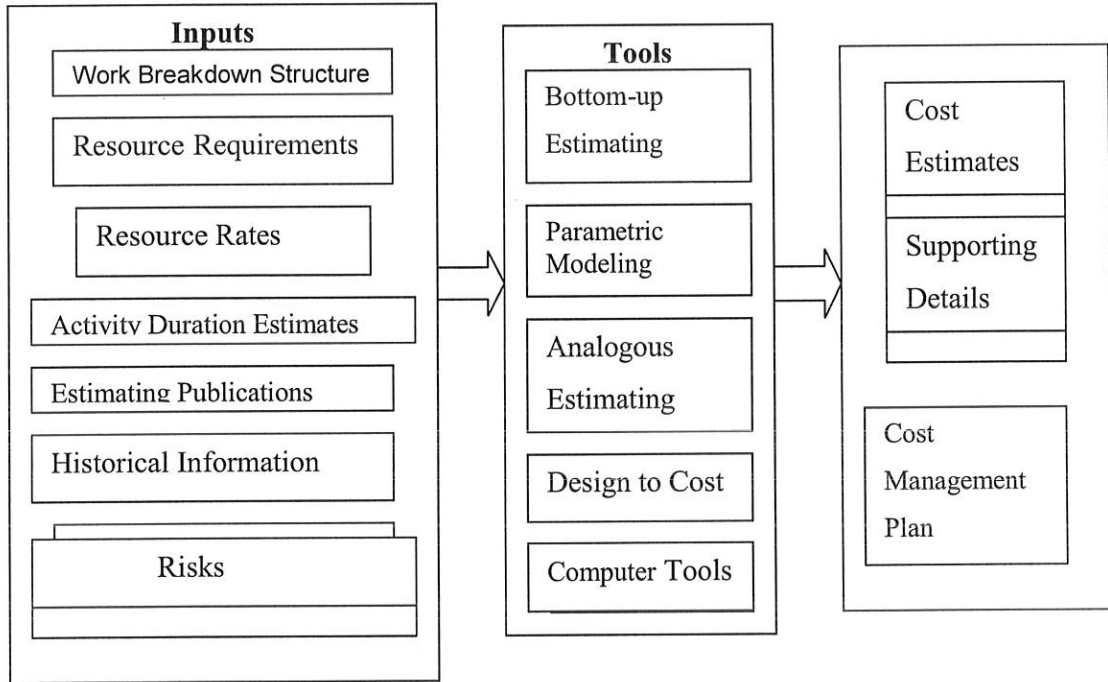
*Source: Cost Management Condensed Handbook, 2003.*

In trying to match up resources with tasks and keep costs in line, the planners will need to look at alternatives in timing and choosing resources. They will need to refer back to project scope and organizational policies to ensure plans meet with these two guidelines. The output of this process is a description of the resources needed, when they are needed, and for how long. Once there is a resource plan, the process of estimating begins.

## **B) Estimating Costs**

Estimating is the process of determining the expected costs of the project. There are overall strategies to determining the cost of the overall project, as well as individual methods of estimating costs of specific types of activity. The choice of approach will depend on the time, resources, and historical project data available. The cost estimating process elements are shown in Figure 5.

**Figure 5. Cost Estimating Elements**



*Source: Cost Management Condensed Handbook, 2003.*

The tools used to perform the actual estimating can be one or more of several types. The major estimating approaches shown in Figure 5 are:

### **1. Bottom-Up Estimating**

Bottom-up estimating consists of examining each individual work package or activity and estimating its costs for labor, materials, facilities, equipment, etc. This method is usually time-consuming and laborious but results in accurate estimates. If well prepared, detailed input documents are used. Bottom-up estimates are often prepared by contractors to support their proposal bid process. This involves using a detailed WBS and pricing out each work package making up the project (Chapman, 1997: 1).

## **2. Analogous Estimating**

Analogous estimating, also known as top-down estimating, uses historical cost data from a similar project or activities to estimate the overall project cost. It is often used where information about the project is limited, especially in the early phases. Analogous estimating is less costly than other methods but it requires expert judgment and true similarity between the current and previous projects to obtain acceptable accuracy (Chapman, 1997: 1).

## **3. Parametric Estimating**

Parametric estimating uses mathematical models, rules of thumb, or Cost Estimating Relationships (CERs) to estimate project element costs. CERs are relationships between cost and measurements of work, such as the cost per line of code. Parametric estimating is usually faster and easier to perform than bottom-up methods but it is only accurate if the correct model or CER is used in the appropriate manner (Chapman, 1997: 1).

## **4. Design-to-Cost Estimating**

Design-to-cost methods are based on cost unit goals as an input to the estimating process. Tradeoffs are made in performance and other systems design parameters to achieve lower overall system costs. A variation of this method is cost as the independent variable, where the estimators start with a fixed system-level budget and work backwards, prioritizing and selecting requirements to bring the project scope within budget constraints (Chapman, 1997: 1).

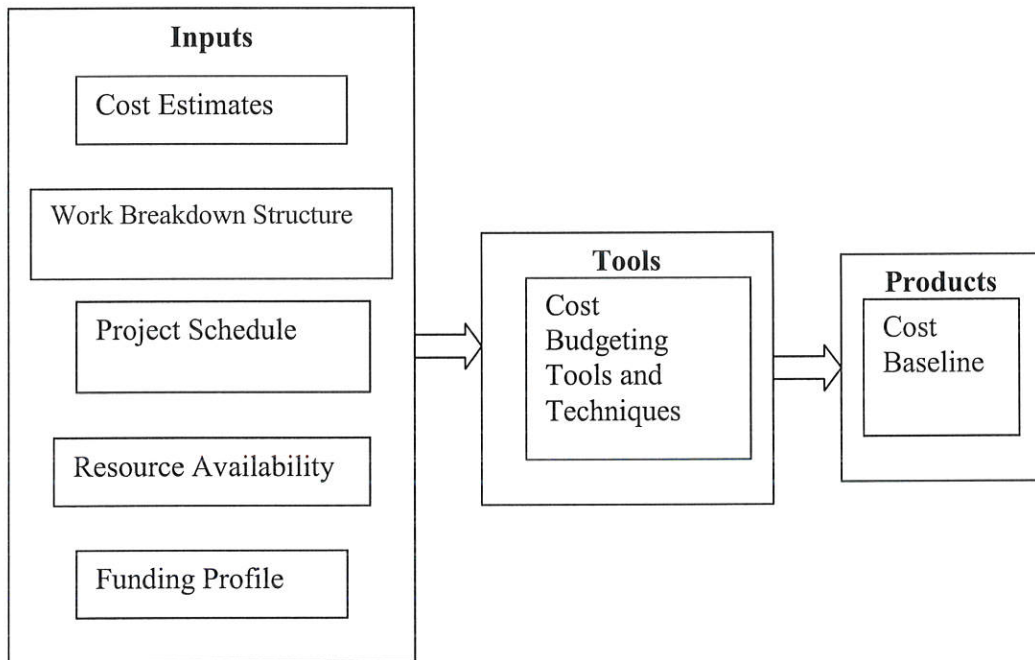
## **5. Computer Tools**

Computer tools are used extensively to assist in cost estimation. These range from spreadsheets and project management software to specialized simulation and estimating tools. Computer tools reduce the incidence of calculation errors, speed up

the estimation process, and allow consideration of multiple costing alternatives (Chapman,1997 : 1).

### **C) Cost Budgeting**

Once the costs have been estimated for each WBS task, and all these are put together for an overall project cost, a project budget or cost baseline must be constructed. The budget is a spending plan, detailing how and at what rate the project funding will be spent. The budgeting process elements are shown in Figure 4. All project activities are not performed at once, resources are finite, and funding will probably be spread out over time. Cost estimates, WBS tasks, resource availability, and expected funding must all be integrated with the project schedule in a plan to apply funds to resources and tasks. Budgeting is a balancing act to ensure the rate of spending closely parallels the resource availability and funding, while not exceeding either. At the same time, task performance schedules must be followed so that all tasks are funded and completed before or by the end of the project.

**Figure 6: Cost Budgeting Elements**

*Source: Cost Management Condensed Handbook, 2003.*

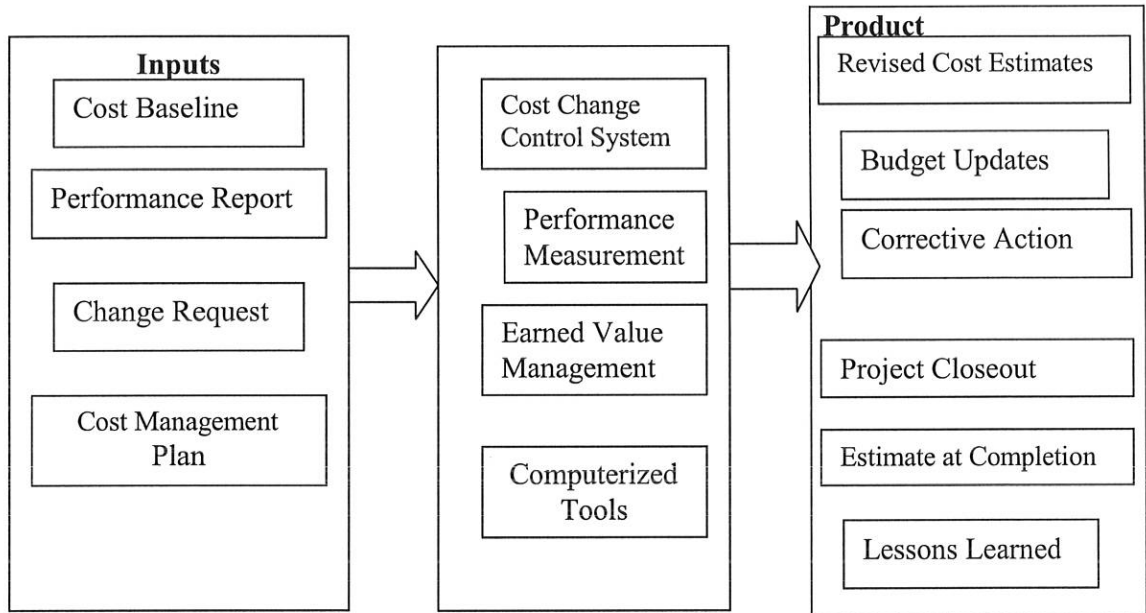
The spending plan forms the cost baseline, which will be one of the primary measures of project health and performance. Deviations from this cost baseline are major warning signs requiring management intervention to bring the project back on track. Various tools and techniques are available to assist in the budgeting process. Most of these are implemented in some form of computer software. Budgeting is usually a major part of project management software.

#### **D) Cost Control**

Cost control is the final step of the cost management process but it continues through the end of the project. It is a major element of project success and consists of efforts to track spending and ensure it stays within the limits of the cost baseline.

The input, tool, and product elements of the cost control process are shown in Figure 7.

**Figure 7: Cost Control Elements**



*Source: Cost Management Condensed Handbook, 2003.*

According to Cost Management Condensed Handbook (2008) The following activities make up the cost control process:

- Monitor project spending to ensure it stays within the baseline plan for spending rates and totals.
- When spending varies from the plan determine the cause of variance, remembering that the variance may be a result of incorrect assumptions made when the original cost estimate was developed.
- Change the execution of the project to bring the spending back in line within acceptable limits, or recognize that the original estimate was incorrect, and either obtain additional funding or reduce the scope of the project.
- Prevent unapproved changes to the project and cost baseline.

The cost control process compares cost performance reports with the cost baseline to detect variances. Guidance on what constitutes unacceptable variance and how to deal with variance can be found in the cost management plan, developed during the estimation activities. Few projects are completed without changes being suggested or requested. All change requests should run the guarantee of cost control to weigh their advantages against their impact to project costs. Cost control tools include performance measurement techniques, a working cost change control system, and computer based tools. A powerful technique used with considerable success in projects is Earned Value Management, if used appropriately. It requires a fully defined project up front and bottom-up cost estimates, but it can provide accurate and reliable indication of cost performance as early as 15 per cent into the project. The outputs of cost control include products which are ongoing throughout the life of the project: revised cost estimates, budget updates, corrective actions, and estimates of what the total project cost will be at completion. Corrective actions can involve anything that incurs cost, or even updating the cost baseline to realign with project realities or changes in scope. Cost data necessary to project closeout are also collected throughout the life of the project and summarized at the end. A final product, extremely important to future efforts, is a compilation of lessons learned during the execution of the project (ibid).

As mentioned earlier cost control is one of the project cost management processes. Project managers and others will want to know the rate of expenditure is in line with the plan. In order to achieve these purpose managers uses different tools. Among these tools tabulation, graph, milestone monitoring and earned value are used by project managers very commonly. Hereafter each tool is briefly described.

### **a) Tabulation**

Project cost estimates should be tabulated too on a form with the work breakdown structure. This will help to ensure that comparison can readily be made between the estimate and the cost records of the actual costs eventually incurred, on strict items

for item base. This is essential as a part of the cost reporting and control functions (Lock, 2003: 233).

### **b) Cost Monitoring Using Simple Graph**

Project manager and others will want to know whether the rate of expenditure is in line with the plan. One common method is to draw a graph of budgeted costs against time and then compare the actual costs against the budget periodically. Two points need to be made about the source for the budget and actual cost data (Frame, 2002: 220); & (Lock, 2004: 308). Care should be taken to ensure that the budget basis and actual cost basis correspond, so that like is compared with like. This applies not only to the selection of tasks or work packages, but also to the times when the relevant costs are to be considered.

Additionally the source of actual cost data must allow collection as soon as possible in the project life cycle, so that adverse trends can be picked up in time for corrective action.

### **c) Milestone Monitoring**

Milestone monitoring (or milestone analysis) is one of the simpler methods by which managers can compare actual costs and progresses with a project budget and schedule of work. The method is neither most effective nor the most detailed, but it has the merit of needing only a modest amount of effort to set up and maintain. It also has the advantage of being useful where the project plans and work breakdown structures are not available in great detail (Turner & Simster, 2004: 207).

The first step in milestone analysis is obviously to decide what milestones are. This is done by identifying certain key activities or events, which lie at the boundaries between significant phases of the project. Put another way, a milestone denotes a particular seriously recognized stage in the progress of project. Towards completion

with all milestone data available, the milestone /budget/ curve can be plotted. As milestones are delivered, actual cumulative costs are plotted on the same axes as the graph of planned costs (Lock, 2004: 312).

The method involves comparatively little effort and is a considerable improvement on simple comparison of actual and budget cost graphs. It may, therefore, be attractive and useful to the project manager who has insufficient time and resource for carrying out more detailed analysis and prediction (Turner & Simster, 2004: 127).

#### **d) Earned Value**

Earned value analysis was developed in the 1960s to allow the government to decide whether a contractor should receive a progress payment for work done (Lewis, 2002: 89). Earned value is a tool which enable project managers to determine where the project stands in relation to budget and schedule, even on projects with hundreds of thousands of activities, some of which are on track at any given time, while others are either ahead of schedule or behind (Desmond, 2004: 123). Earned value analysis is considered the correct way to control and monitor any project (Lewis, 2002: 90).

In project management, this value is earned as activities are completed. Thus, EV is also a measure of progress as there is a direct relationship between EV and percentage completion. Earned value is a common and consistent unit of measurement for progress on a project or any sub-element of the project; it also provides a consistent technique for analysis of project performance; and it forms a basis for comparing cost performance across projects or sub-elements (Raby, 2000: 223).

In general EV is a tool for improving the analysis of progress and performance on a project. It does this by: providing a uniform unit of measure for project progress; enforcing a consistent method for analysis and reporting; and providing a sound basis for the analysis of cost performance (Raby, 2002: 227); (Martin, 2003: 229).

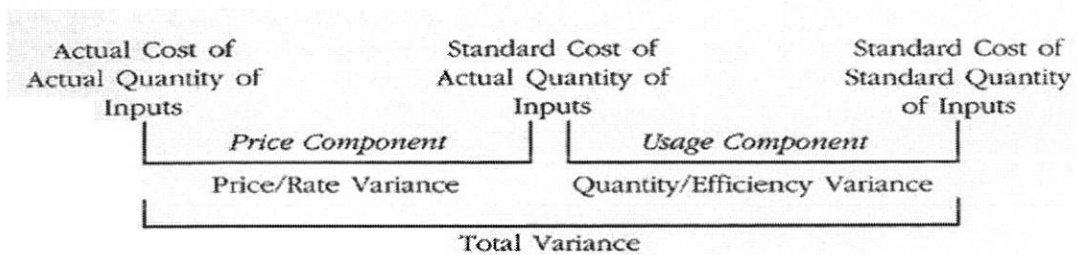
### 2.1.5.1 Cost Variance Analysis

Performance measurement is essential in an organization. It can provide critical information as to what works and what doesn't; it is a way to evaluate and motivate employees; and it can provide a means of carrying out the basic strategy of the company. Most companies use some combination of financial and non-financial performance measures to measure performance (Standard Costing and Variance Analysis: 171-173).

Many companies not only use standards to measure performance but they employ a standard cost accounting system, which records both standard and actual costs. Standard costs are the budgeted costs incurred to produce a product or perform a service. A standard cost system greatly facilitates an analysis of variances, the differences between actual costs and standard costs.

In a standard cost system, then, both cost and quantity standards are established for the cost inputs of direct material, direct labor, and overhead. Any difference between actual and standard cost creates a variance, either favorable or unfavorable, and may be investigated further. This process facilitates management by exception depending on the significance of the variance management takes appropriate action. The general model of variance analysis takes this form:

Figure 8 Cost Variance



*Source: Variance Analysis Chapter 10*

### **2.1.6 Project Time Management**

A schedule is the conversion of project action plan in to an operating time table. As such, it serves as the fundamental basis for monitoring and controlling project activity and taken together with the plan and budget, is probably the major tool for the management of projects (Marchewka, 2003: 148). Most people agree that scheduling ranks high in the skills needed for successful project management. It is required to ensure that project is delivered at a time to make a worthwhile profit, coordinate activates of the resources working on the project, and schedule expenditure ( Lock 2003: 478).

For schedules, progress on individual activities and the achievement of milestone completions can be compared with the project schedule to monitor the progress of activities. The basic approach of all scheduling techniques is to form an actual or implied network of activity and event relationships that graphically portrays the sequential relations between the tasks in project. The following are the most fundamental tools and techniques of scheduling.

#### **a) Network Method**

The single most famous tool in project managerial tool box is the PERT/ CPM network diagramming technique. Network analysis is the general name given to certain specific techniques which can be used for the planning, management and control of projects. Network analysis is a vital technique in project management. It enables us to take a systematic quantitative structured approach to the problem of managing a project through to successful completion (Martin,2003: 241).

One of the more common project estimation schemes is Critical Path Method (CPM). A critical path consists of a set of dependent tasks (each dependent on the preceding one), which together take the longest time to complete. Project managers who use

CPM ignore the probabilities and use only nominal case estimates(Martin ,2003: 354).

Program evaluation and review technique (PERT) is a technique for estimating and planning a large project. One of its most powerful concepts is that project management is the management of probabilities. PERT makes use of simple statistical mathematics in order to come up with a probability distribution for the completion dates of the project milestones Martin (2003: 336). In PERT tasks are estimated with three numbers: the best case, the nominal case, and the worst case . These three estimates are combined into an expected duration, and a standard deviation. Thus the duration of each task is presumed to be a random variable with a known distribution Martin (2003: 337). Program evaluation and review technique (PERT) charts depict task, duration, and dependency information. Both PERT and CPM represent the project with a diagram that shows the tasks and their dependencies (Martin, 2003: 350).

PERT can be considered an extension of CPM. Instead of using a fixed time estimate for each activity, activity times are assumed to follow the generalized Beta distribution. Thus, PERT is a probabilistic network model whereas CPM is a deterministic network model (Haga & O'keefe, 2001)

The PERT/ CPM approach served project managers well over a period of several decades. It remains the core scheduling technique used in project management today, and this turns out to cause a bit of a problem. Martin (2003: 242).

## **b) Gantt Chart**

One of the oldest and still one of the most useful methods of presenting schedule information's is the Gantt Chart, developed around 1917 by Henry L. Gantt, a pioneer in the field of scientific management. During the first half of the twentieth century the principal scheduling tool was the bar chart. These diagrams are often called Gantt

chart; Gantt charts continue to be popular today, mainly as a tool to communicate the schedule to people working on the project. However, the amount of information they can convey is limited, both in terms of the practical number of project tasks and in the way in which those tasks can be shown to interrelate. In the 1950s a new family of techniques emerged which overcome these limitations. These were all based on the use diagrams called critical path networks (Lock, 2004: 89).

The Gantt chart shows planned and actual progress for a number of tasks displayed against a horizontal time scale. It is particularly effective and easy-to-read method of indicating the actual current status for each of a set of tasks compared to the planned progress for each item of the set. As a result, the Gantt chart can be helpful in expediting, sequencing, and reallocating resources among tasks, as well as in the valuable but mundane job of keeping track of how things are going. In addition, the charts usually contain a number of special symbols to designate or highlight items of special concern to the situation (Mantel, 2001: 354)

There are several advantages to the use of Gantt charts. First, even though they may contain a great deal of information, they are easily understood. While they do require frequent updating, they are easy to maintain as long as task requirements are not changed or major alterations of the schedule are not made. Gantt Charts provide a clear picture of the current state of a project (Mantel, 2001: 355).

Another significant advantage of Gantt charts is that they are easy to construct while they may be constructed without first drawing a PERT diagram, there is a close relationship between the PERT/ CPM network and the Gantt chart (ibid: P. 356)

### **c) Critical Chain Scheduling**

Critical Chain Scheduling represents the first real breakthrough in project management in the last 40 years. How to manage uncertainty is at the core of improvement of project performance.

Developed through the application of the Theory of Constraints to the subject of projects, "Critical Chain Scheduling" suggests the shifting of focus from assuring the achievement of task estimates and intermediate milestones to assuring the only date that matters--the final promised due date of a project. As a matter of fact, the scheduling mechanisms provided by Critical Chain Scheduling require the elimination of task due dates from project plans. One benefit is that it allows those who use it to avoid the significant impact of "Parkinson's Law;" i.e., work expanding to fill the time allowed (Lock ,2003: 481).

### **2.1.7 Project Communication**

The PMBOK defines project communication management as; '...the process required to ensure timely and appropriate generation, collection, dissemination, storage and ultimately disposition of project information. It provides the critical links among people, ideas and information that are necessary for success.' (Burke,2004: 6).

Decision making process relates to the control of project performance during its implementation phase, and to the management of changes and associated risks. Such decisions are often ill informed unless the monitoring and control processes, and the subsequent need for re-planning, are performed within an open system view of a project. This means that the awareness of the higher level concerns (project context, content, and behavior) should be incorporated in project related decisions, for only then could the project be seen in its totality, and the focus towards its ultimate goals and customers maintained (Cicmil,2000: 560).

Systems facilitate the integration of multiple project perspectives and levels of concern into informed project management decision-making. As a number of respondents indicated, a well-designed project communication system minimizes the risk of project failure caused by variables so often referred to as "fatal external factors beyond the control of the project team". Ultimately, it closes the gap between the



unique project goals on the one hand, and multiple sources of factors that influence project performance, on the other. An effective project management information system also moderates the inherent conflict between a high degree of instability and ambiguity in a project environment and an explicit, and often rigid, nature of project objectives and constraints (Cicmil,2000: 561).

### **Communicating the Work Program**

According to (Lock, 2004: 479) to give a project some chance of being carried out according to the client's wishes, the management methods and structure have to be suitable. Consider a contracting organization which has received a prized order for a new project. Possibly over one hundred of the contractor's staff is going to be working on the new project for a prolonged period. All good news, but how do they know when to start and what to do?

The first official document used in many companies to start a new project is a project authorization. This gives key information about the project in summary form. Apart from giving information about the project, project authorization carries the signature of a director or senior manager which authorizes the start of work and other expenditure on the new project (Lock, 2004: 482).

Work to list while the works order or other project authorization document gives instructions across the organization in broad management outline, it does not carry enough detail from which to issue and control work down to the level of separate jobs in all the separate department and groups. The most effective and convenient tool for that function is the work- to list, derived from the project network. This provides each manager with a list of all project tasks for which he or she is responsible. (ibid : 482).

## **Kick-off Meeting**

Once the project charter and project plan are approved, many organizations have a kick-off meeting to officially start work on the project. This is the time and place to explain the project's general technical and procedural requirements, warn of specific risks, quantify deliverables, obtain everyone's agreement and commitment, and generally encourage all concerned to get their forces mobilized and motivated (Lock, 2003: 132).

The kick-off meeting is useful for several reasons. First, it brings closure to the planning phase of the project. Second, it is a way of communicating to everyone what the project is all about. It is important that every one starts working on the project with a positive attitude (Marchewka ,2003: 71).

## **Progress Meeting**

Progress meetings provide a forum in which progress difficulties and risks can be discussed and action agreed. Each meeting should be managed by the chair, with the aid of a sensible agenda, so that it deals effectively with all matters related to keeping the project on schedule but is not side-tracked into technical and other issues that should more properly be dealt with elsewhere. Progress meetings should also be kept as short as possible (Lock, 2003: 499). The frequency of progress meetings depend on the duration and complexity of the project. For highly intensive project carried out at feverish speed over just a few weeks or months, it might be deemed appropriate to hold short progress meetings every week. Monthly is a more usual interval for most projects.

During progress meetings it is common for individuals to be asked to make estimate or to give promises of fresh dates by which late or additional jobs can be finished. A firm measurable commitment should be provided at such situations.

Progress meetings are a waste of time when the agreements reached are not followed up to ensure that promises are kept. The control document for this purpose is that containing the minutes of the meeting (ibid: 500).

## **Progress Reporting**

According to (Lock, 2004: 501), for the purpose of project management three distinct types of reports can be considered: routine, exception and special analysis. Routine reports are those issued on a regular basis. Exception reports are useful in two cases. First they are directly oriented to project management decision-making and should be distributed to the team members who will have prime responsibility for decision or who have a clear "needs to know". Second, they may be issued as a decision is made on an exception basis; in other words, as part of a sensible procedure for protecting oneself. Special analysis reports are used to disseminate the results of special studies conducted as part of the project or as a response to special problem that arise during the project.

The relationship of project reports to the project action plan is the key to the determination of both report content and frequency. Reports must contain data relevant to the control of specific tasks that are being carried out according to specific schedule.

In addition to the criterion that reports should be available in time to be used for project control, the timing of project milestones.

Thus far we have discussed relevant points in relation to project and project management ranging from project life cycle to project time management, project cost management and project communication. The subsequent section deals with review of experiences from other countries. Ethiopia tried to achieve universal access through using its sole telecom service provider; ETC. This paper analyzes this rural

connectivity project implemented. The experience of other countries undertaking similar endeavors has direct bearing on Ethiopia's situation.

## **2.2. Relevant Experiences and Lessons from Other Countries**

### **2.2.1 Introduction**

Till now, we have discussed the theoretical framework of project management. Now we are going to see the relevant experience and lessons from various countries through reviewing literature that include Bangladesh, Peru, Uganda and Argentina. The experience of these countries are taken because these countries are third world countries like Ethiopia and achieved success in expanding rural communication in their countries through using different mechanism. Now lets see experiences and lessons from countries like Bangladesh, Peru, Uganda and Argentina one after the other.

### **Bangladesh**

According to Business Model for Rural Telecom Services (ETC 2006: 37), in Bangladesh, 97 percent of homes and virtually all rural villages lack a telephone, making the country one of the least wired in the world. This lack of connectivity has contributed to the underdevelopment of the country and the impoverishment of individual Bangladeshis.

To address this problem, Grameen Bank, a micro-finance institution, formed two entities in 1995/96: 1) Grameen Telecommunications (GTC), a wholly-owned non-profit organization to provide phone services in rural areas as an income-generating activity for members of Grameen Bank, and 2) Grameen Phone Ltd., a for-profit entity that won a national GSM cellular license. Grameen Phone has since become the

country's dominant mobile carrier, providing services in urban areas and along the major railway routes. (ibid.)

Grameen Telecommunications has the explicit goal of helping Grameen Bank's members shift from relatively low-yield traditional ventures, like animal husbandry, into the technology sector by creating micro-enterprises that can both generate individual income and provide whole villages with connectivity.

GTC uses GSM (Global System for Mobile Communication) cellular telephone technology at the village level, taking advantage of Grameen Phone idle installed urban capacity, in stationary village phones owned and operated by local entrepreneurs. These entrepreneurs purchase the phones with money borrowed from Grameen Bank and sell phone services to customers by the call. Here Grameen Telecom buys airtime in bulk from Grameen Phone and passes on most of the savings to Village Phone (VP) operators through low tariffs ( ibid).

These operators are selected making use of Grameen Bank's extensive network of 1,140 branches spread over 39,346 villages. There are strict criteria for selecting Village Phone operators:

- Preferably must be a female with a good repayment record at Grameen Bank;
- He/she should have a profitable business, preferably a village grocery store, and have the spare time to function as the VP operator;
- Should be literate or, at least, have children who can read and write; and
- The person address or store should be located near the centre of the village.

Each pay phone, on average, covers 2,500 people.

Then, once the operator is selected, it receives a loan to finance the acquisition of a mobile telephone kit. The operator repays the investment and pays for the telephone usage through the loan collection system of Grameen Banks.

This shared-access business model concentrates demand and creates relatively high cash flow, even in poor villages, enabling operators to make regular loan payments and still turn a profit. Repayment rates to Grameen Bank are 90 -95 percent. Even in the starting phase, the average income per village phone operator was more than \$US 700 per year.

As part of a strategy to provide universal access to telecommunications, Grameen's specific objectives are:

- To provide easy access to telephones when needed all over rural Bangladesh;
- To introduce a new income generating source for villagers;
- To bring the potential of the Information Revolution to the doorsteps of villagers; and,
- To introduce telecommunications as a new weapon against poverty.

It is important to mention that Grameen's initiative is completely private; it does not receive any support from the government. This is one of the interesting characteristics of this process but is also a limitation because in order to be replicated in other countries it requires a private operator willing to provide the institutional framework for this process to work (ibid).

## **Peru**

Business model for rural telecom services (ETC, 2006: 38) states that in order to provide universal access for the rural village Peru uses conditional licenses. That is the telecommunication operator must provide service to rural and remote areas as a condition of the license. The telecom provider is required to contribute 1 percent of gross revenues to a rural telecommunication fund as a license condition.

Besides, the regulatory agency of Peru, managing the Rural Telecommunication Investment Fund, promotes universal access to telephone services in most rural Peru by subsidizing the activities of private telecommunication companies.

Its objective, in promoting universal telecom access can be summarized by as follows:

- Promoting maximum access to telecommunications services for the population in rural areas and places of special social interest.
- Promoting the social and economic development of rural areas and places of special social interest through access to Internet and the integration of such areas with the information society.
- Promoting participation of the private sector in the provision of telecommunications services in rural areas and places of special social interest (ibid.)

The regulatory agency of Peru designed a gradual strategy with several phases:

The first stage consists of providing basic access to public telecommunication services and low speed data transmission. To achieve this objective, the regulatory agency develops criteria to select villages that would maximize social benefits derived from investment in telecommunications. It is worth noting that a basic element in the methodology applied in the selection of villages was the participation of district authorities all over the country (ibid).

The second stage of the strategy consists in increasing tele-density, i.e. access to public telephones in provinces and villages with inadequate services. This includes approximately 1,500 villages which population ranging between 1,000 and 5,000 inhabitants. There are also attempts to provide massive Internet access through public telephones (Tele-centers) in all capitals of rural districts, in conjunction with training program and plan for promoting the development of local contents. A further possibility in this stage is to allow users, operators or investors, to put forward initiatives for the development of Pilot Telecommunications Projects. The regulatory agency of Peru will analyze these initiatives for funding (ibid).

## Uganda

In 2000, the Uganda Communication Commission estimated the national tele-density to be 0.28 percent with more mobile than fixed phones. In order to promote more investment and increase telephone coverage in the country, the government introduced a series of reforms. Among these the major one is the enactment of the 1997 Ugandan Communication Act, which ends the monopoly of Uganda Post and Telecommunication Corporation (UPTC) in 1997 and led to formation of Uganda Telecom Limited (UTL). This also followed by several actions were undertaken to promote private investment in the telecommunication sector. Business Model for Rural Telecom Services (ETC, 2006: 39)

Parallel developments have been taking place in the rural front. Among these the Nakaseke Multipurpose Community Tele-center (MCT), which became operational in March 1999, is worth mentioning in Ugandan rural telecommunication activity.

The Nakaseke Multipurpose Community Tele-center is located in the 254 square kilometers rural Nakaseke Sub-county in the Luweero District of Uganda, about 50 kilometers north of Kampala. It serves two sub-counties (administration units), Nakaseke and Kasangombe, and a network of villages with a total population of 31,000 people. It mainly provides Telephone and fax, Resource centre for schools, Internet and e-mail, ICT training and applications (ibid).

The MCT receives budget support of up to 60 percent of its running costs from its international partners (IDRC, ITU, UNESCO and DANIDA) and the Government of Uganda. The local community provides the remaining 40 percent of the budget. The community assumed greater responsibility for building maintenance, staff salaries and allowances, security guards and other running costs.

The participation and involvement of the community has given central attention to the implementation of the Tele-center's activities. The community representing each of the core target groups to elected from and a Local Steering Committee:

- Supervise the Tele-center's daily activities.
- Liaise with the Management Committee.
- Mobilize the community to participate in all activities and programs.

Steer community ownership programs and involve the community in any activities that promote the sustainability of the Tele-center, including organizing fundraising activities.

These arrangements generate a stronger sense of ownership among the beneficiaries, and make the MCT more accountable to the community.

To develop the local capacity to appreciate, use and manage the MCT, a large number of community members were trained in the use of ICT and as trainers. Besides, in support of the indigenous knowledge program, the MCT collects local knowledge and practices in health and agriculture and repackages this in video, audio and print for interested members of the community.

Finally, it is worth mentioning that The Uganda experience is probably one of the few success stories in the case of tele-centers due to the community receptiveness and willingness to pay to absorb the increasing costs of the service. The key ingredient for success has been the early involvement of the community in the design and implementation of the initiative. Local leadership and ingenuity have proved very valuable also(ibid).

## **Argentina**

According to Business Model for Rural Telecom Services (ETC,2006: 40) Community Telecommunication Cooperatives in Argentina begun in 1959 and continuing until privatization in 1989. Telephone services in Argentina were managed by ENTEL, the state telephone monopoly, which provided service to profitable urban areas, and avoided the expense and complexities of thinly populated rural areas.

A special regulation allowed the creation of telephone cooperatives, nonprofit organizations qualified to provide telephone services in their areas, if the areas were declared non-profitable by ENTEL.

Accordingly, the first cooperatives appeared in 1958 to bring telecommunications to rural areas not served by the National Telecommunications Company (ENTEL). In a few decades the number of cooperatives grew considerably, and at the beginning of the nineties, there were approximately 1,300 cooperatives that provided electricity, telephony, gas and/or water. More than 300 of these cooperatives offered telecommunications (ibid: 40).

After the liberalization of the Argentinean market in 2000, the cooperatives were given the monopoly in their areas, but they were obliged to satisfy certain objectives of expansion. Interestingly, moreover, in 1999 an association of 250 cooperatives was given a license to operate public telecommunications. Consequently, the cooperatives have played a major role in connecting the rural areas of Argentina, while traditional private operators serve more densely populated areas. (ibid).

This section of the research described the experience of Bangladesh, Peru, Uganda and Argentina with respect to expanding rural communication in their respective scenarios. These efforts shed light on the means to achieve success in expanding rural communication. The main purpose of looking at these countries' experience is to get some lessons for the future rural telecom expansion works in ETC.

As stated earlier different countries use varying mechanisms in order to achieve rural telecom expansion. Bangladesh achieved the purpose through using a private operator i.e. Grammen Bank which is a private operator willing to provide the institutional operator for this process to work. It does not receive any support from the government.

In Peru, the regulatory agency of Peru promotes universal access to telephone services in most rural areas by subsidizing the activities of private telecommunication companies.

In Uganda, there are two major tele-centers. They receive budget support of up to 60 percent of running costs from its international partners.

In Argentina, a special regulation allowed the creation of telephone cooperatives, and nonprofit organizations qualified to provide telephone services in their areas. The cooperatives have played a major role in connecting the rural areas in Argentina.

As we have seen from the above-mentioned countries experiences, government has a minor role at most in the rural telecom expansion. However, in Ethiopia the sole telecom operator tried to address this issue. Schor (2005: 10) suggests that very few countries have achieved universal access goals through monopoly operators and for this reason most countries have embarked on sector reform. Therefore, ETC should evaluate its performance and take some corrective action regarding its next implementation phase.

This section has given a broad overview of projects and project management. The points discussed range from project life cycle to project time management, project cost management and project communication. Moreover, we have drawn lessons from other countries' experiences concentrating on their successes in expanding rural communications. The next section will examine project management experience of the Ethiopian Telecommunications Corporation.

## *Chapter Three*

### **3. PROJECT MANAGEMENT EXPERIENCE OF ETC**

#### **3.1 Background History of ETC**

The history of Ethiopian Telecommunications Corporation (ETC) is linked with the introduction of telecommunications services to the country in the early 1890's. Telecommunications service started in Ethiopia more than a hundred years ago in 1894 during the era of Emperor Menelik II who ruled Ethiopia from 1889 to 1909. Ethiopian Telecommunications Corporation is the oldest telecommunications operator in Africa. The company was placed under government control at the beginning of the twentieth century, and was later brought to operate under the ministry of post and communications. In 1952, telecommunications services were separated from the postal administration and structured under the Ministry of Transport and Communications (today's Ministry of Infrastructure). ETC (2006: 15).

The network began to expand from then on, extending to other cities of Ethiopia from its original network covering the capital, Addis Ababa. After the end of war against Italy (1936-1941), during which telecommunication network was destroyed, Ethiopia re-organized the Telephone, Telegraph and Postal Services in 1941. It also established the Imperial Board of Telecommunications of Ethiopia (IBTE) by proclamation No. 131/52, whose activity was funded from domestic sources and from the World Bank. ETC (2006: 16).

The Imperial Board of Telecommunications of Ethiopia, which became the Ethiopian Telecommunications Authority in 1981, was placed in charge of both the operation and regulation of telecommunication services. In the wake of the market reforms occurring after the current regime took power from the military of rule of Mengistu Haile Mariam, regulation number 10/1996 of the Council of Ministers brought about the Ethiopian

Telecommunications Corporation (ETC) to which all the rights and obligations of the former Ethiopian Telecommunication Authority were transferred.

ETC then has taken responsibility to operate as a public enterprise with the principal duty of maintaining and expanding telecommunication services in the country and providing domestic and international telephone, telex, and other communication services under the supervision of Ethiopian Telecommunication Agency (ETA), which is a separate regulatory body founded by proclamation No. 49/1996, with the objective of promoting the development of “High quality, efficient, reliable and affordable telecommunication services.” In this respect, it is currently deemed by the regulation that ETC is the sole operator of any telecommunication related service including the provision of Internet and public phone. ETC (2006: 17).

ETC provides the following services to its customers:

- Basic telephony services: Fixed telephone with various types of communications systems, facilities and value added services, public coin telephones, pay stations, fax telegram, telex, etc.
  - Mobile telephony services: This includes GSM network services with voice and text messaging and other value added services.
  - Internet services: Dial up, dedicated leased lines, cyber café, etc.
  - Network services: Broadband, leased line, etc.
  - Satellite services: VSAT, etc.
  - TV rebroadcast services: Receivers/TVRO/, and transmission of the national TV.
- ETC Company Profile (2006: 5).

Ethiopian Telecommunications Corporation is achieving a set of goals with organizational mission, vision and value. ETC’s **vision** is to see the entire country connected with ICT infrastructure that provides highly qualitative, reliable and secure communication services at affordable prices. ETC’s **mission** aims to introduce modern and up-to-date ICT infrastructure across the nation to support voice, data, and video

services. Its **values** include the Corporation's operations, which are based on a high value of respect to the customer and its employees. For this purpose the company values give priority to quality customer service, excellence, integrity and advocacy of ICT in the country. ETC has been structured corporate with zonal and regional levels serving above one million customers. Currently, ETC has more than ten thousand permanent employees. Company Profile ETC (2006: 5).

### **3.2. Project Management Practice**

ETC undertakes a number of projects every year. These projects are classified in general terms as follows:

- Major Infrastructure Projects- Switching projects, Access projects, Transmission projects, Mobile network projects and International and Data network Projects.
- Support Infrastructure Projects- Civil Construction Projects, Power and AC Projects and Billing Projects.
- Non-Infrastructure Support Projects- Maintenance and Facilities Projects, Logistics Projects and Capacity Building Projects.

As a corporate directive, ETC executes projects through its own capacity or by outsourcing depending upon the nature of the project. Projects that can be carried out by own capacity are undertaken by ETC's functional unit. Projects that cannot be undertaken by the internal capacity due to the volume of projects such as civil constructions will be awarded to local companies. But projects that cannot be done by internal or local contractors due to technology advancement are outsourced to foreign companies. Management policy directive ETC (2006: 13).

The multitude, complexity, their dependencies on each other and major inputs make ETC projects unique in the process of planning and implementation. They need

sequencing in both the planning and executing stages. Thus, ETC's major infrastructure and support infrastructure projects could be sequenced by type of the project in terms of network or infrastructure type and segment (service node, access, transmission, support, infrastructure etc.) are required to be implemented sequentially to make the service operational; there is no such a single project in ETC that delivers output (renders service) by its own. (ibid, P.13).

### **3.3 Project Implementation, Controlling & Monitoring**

In ETC, capital project initiation starts from the strategic plan of the corporation, which is prepared in response to the requirements of the government. Based on this, strategic business units (SBU's) initiate capital project proposals for the succeeding year at the end of the first quarter of each Ethiopian fiscal year using appropriate formats/ forms. The submission of initial project proposals has two purposes: establish the basis to justify the projects for which initial project proposals are being prepared; and provide the management with an understanding of the overall need for each project. After the board of management approves the project budget, a separate work order must be issued before project implementation started.

According to project management policy directives ETC (2006: 5) capital projects in ETC are classified into three according to their project cost and authorization. These are:

- Small Projects: Projects worth less or equal to Birr 1,000,000.
- Medium projects: Projects worth Birr 1,000,001 - 5,000,000.
- Large projects: projects worth more than Birr 5,000,000.

According to this directive, if the capital cost exceeds the appraisal cost estimate, it needs the authorization of the CEO to approve additional budget and to issue supplementary works order.

Since 1960 ETC employs a work order system that is one of the main tools enabling systematic accounting and follow-up of project activities. A work order number will be given for each project such that a budget is approved in a systematic manner. Accordingly, the first two digits represent the fiscal year the project is to be implemented followed by a three-digit number, which identifies the department or functional unit, of the project and finally by a four-digit number that uniquely identifies the project.

Issuing of work order number for all projects the corporation undertakes is the responsibility of project monitoring and control deputy division, which is found under the project management and support division. Since PMC is the central originating point for the corporation's work order system it handles various types of project proposals along with project cost estimates and supporting documents for the preparation of separate work orders.

The PMC office is also responsible for conducting the following basic functions: establish improved methods of project monitoring and evaluation system for project; prepares instruction for the work order system and work order chart, the latter in coordination with the concerned bodies, receives work order for completed projects and checks if the necessary information is fulfilled, and then closes out the work order for completed projects.

The PMC office then follows-up the progress of the various works through separate work orders and prepares progress reports. In general, the deputy division office's basic functions are issuing of the corporation's work order and follows-up the progress of projects.

### **3.4 Project Cost Estimation Practice**

**Resource Requirement Determination** - These are determined by SBUs and sent to the Project Planning and Monitoring Division. There is a detailed list of all materials (in types and quantity), labor (with qualification, pay rate, daily allowance and number of

work days), transport and other cost items in the project proposal. The requirements are compiled based on their past experiences if it is done by the internal contractor (totally by ETC), but if it is done by an external contractor the material requirement and its price is found in the contract document because this activity will be done after the budget is approved and the contract is agreed upon.

**Cost Estimation Policies and Procedures** - The cost estimation practice of ETC is undertaken by the SBUs who involve in the project implementation. Based on the resource requirement listed, the SBU determines the cost of materials found in the current market price of each material type; labor cost is estimated by taking the basic salary and allowances of permanent employees and current wage rates of contract employees and daily workers; transportation kilometers (KM) usage is estimated by the implementing offices and calculated by the standard rate; other cost is also estimated by the respective SBUs; but there is no fixed cost estimation trend in the corporation, which leads to variation between the actual and the estimated amount of the project. And, there is no written policy and procedure to have uniform practices in each implementing offices.

**Work Breakdown Structure** - In ETC the detail cost estimation and work breakdown is done after the budget is approved, because each SBU gets the budgeted total amount by specifying the total estimate of the work, and after that WBS is done in order to implement that specific project based on the approved budget.

**Separate Works Order** – After all the above requirements are accomplished the implementing offices send the project proposal to the Project Planning and Support Division to get the separate works order in order to proceed on the work by getting the budget released.

This chapter describes project management experiences, practice and policies of ETC as well as a discussion of the background history of ETC. Moreover, the project implementation, controlling and monitoring in ETC as well as project cost estimation practice has been outlined. The subsequent section details the findings and analyses obtained from secondary data and interviews.

## *Chapter Four*

### **4. Discussion and Findings**

#### **4.1 Introduction**

Ethiopian Telecommunications Corporation, as the sole telecom service provider in the country, has the responsibility of addressing universal access to the rural communities . In order to achieve this target ETC has made planning of rural connectivity project.

The project is multifaceted in that it addresses issues like fulfilling the universal access obligation, lack of communications facilities, paving the way for introduction of investment, encouraging local entrepreneurship and business opportunities, and bridging the gap in access to global market economy. ETC (2006 : 3).

ETC's rural connectivity project is expected to cover 15,000 ' *kebeles* ' throughout the country. This project is expected to be completed in two phases. The first phase that covers around 5000 ' *kebeles* ' was implemented starting 1997 E.C.

Thus in this chapter the findings and analyses obtained from the secondary data and interviews are discussed. The findings and analyses focus on the project implementation practice. i.e. RCP procurement, estimating and controlling of project costs, monitoring and controlling of project schedule and communication process among different stakeholders while implementing the project.

Before discussing the main concern of the paper i.e. the above stated points in detail, a brief discussion about how the rural connectivity project is organized and delegation of responsibility among each implementing unit in the project implementation will aid in granting a holistic understanding of the project implementation.

### **4.1.1 Background of the Project**

In this part rural connectivity project organization and project implementation practice in RCP is detailed.

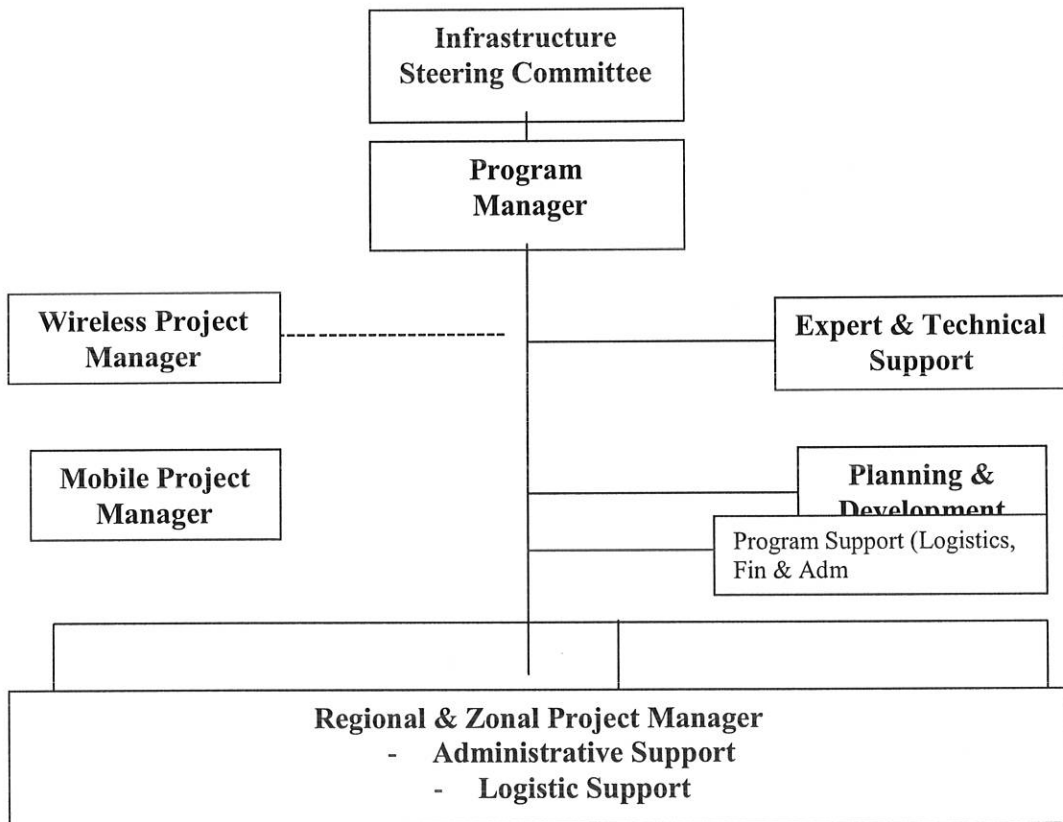
#### **a) Rural Connectivity Project Organization**

There is growing empirical evidence that project success is directly linked to the amount of autonomy and authority project managers have over their projects.

The basic requirement for the success of any project is an organization that will address all the issues pertinent to the successful completion of activities and ensuring that these activities are synchronized towards achieving the whole picture. To this end, various groups have been organized under the project team with specified duties and responsibilities, reporting mechanisms and formats and monitoring system.

RCP is to be based on CDMA-WLL, Mobile and VSAT systems. Thus, the RCP initiative will have specified indirect relations with current Mobile and CDMA-WLL projects that are currently within ETC. Regional and zonal offices that are directly involved in implementation of the project have their own RCP project teams that will work with in coordination with the central project office. The summarized project organization is shown below.

### Rural Connectivity Project Office's Organizational Chart



**Note:** *Wireless and Mobile Project Managers are not directly attached to this structure. The dotted line shows that the output of this project is a requirement for the rural connectivity project.*

*Source: Project Management Document Version 1.1 ETC (2006: 11)*

Each unit in the structure has roles and responsibilities. Accordingly the steering committees that represent the sponsor of the project (ETC) is a team of executives and was responsible for controlling of the project performance as per schedule and allocated

resource, follow-up of overall success and completion of the project, resolving inter organizational issues and facilitating high level decisions.

In the same manner the overall program manager is responsible for total project management, coordinating all activities with the regional coordinators, developing and maintaining project time lines, launching assigned programs on time and within cost and quality objectives and follow-up of the project progress. The RCP Regional Coordinator is responsible for coordination and follows-up on the RCP project; follows-up timely delivery of equipment at sites, preparation of activities to steering committee. Similarly the Program Support (Logistics, Finance Administration) was responsible for handling administrative and financial issues and providing logistics and material handling, coordinating regional administration and logistics and interface with corresponding ETC functional offices. ETC (2006a; 12).

The Technical support team is responsible for making available technical resource and expertise for the project management and technical issues and overall solution design and technology selection jointly with ETC project team and contractors. The Planning & Development team organizes training sites and trainees, coordinates the training program, ensures the training program is conducted as planned and communicates with the program manager about the human resource need. Regional/Zonal project coordinators coordinate and follow-up regional activities follow-up timely delivery of equipments at each site and warehouse, communicate with program managers and deliver weekly progress report to program manager (ibid: 12)

The result of the interviews with RCP program manager and RCP regional coordinators revealed that in the implementation phase of the project expert technical support and planning & development teams were not established. Operational sections replaced their activities. This implies that overall solution design and technology selection for the next project implementation faced problems. In addition, RCP lacks a responsible section that coordinates training programs based on their real need identification.

The above stated project organization faces problems when it comes into implementation. The result of the interview with region coordinators and regional / zonal project coordinators revealed that there was no devised job description provided to the ETC project workers who had been participating in the project, making it unclear to what extent they could properly execute the work. The project manager was not fully empowered to make decisions on issues that have occurred beyond what is stated in the statement of work. This also impedes progress. In this section RCP project organization has been examined while in the next section project implementation practice identification reveals specific working systems.

### **b) Project Procurement Implementation Practice**

To implement the first phase of the program (Universal Access) ETC had made planning attempts and shared different countries' best experiences. After the preparation of both technical and commercial requirements of this project the bid was floated. And finally, the management decided and gave the award to two suppliers on a turnkey basis after the evaluation was made.

In order to reach rural communities ETC predominantly used the CDMA- wireless technology and alternatively GSM and VSAT were also considered for areas beyond wireless reach. However, GSM and VSAT are not used for the rural connectivity project.

The information obtained from the purchase document review confirms that CDMA-WLL had had a tender floated to bidders. Tender No. TF/ 23/04, was issued on October 15, 2004 to procure the system for Rural Connectivity with associated PDSN (packet Data Service Node), (NMS Network Management System), Power supply system and Antenna and Tower Systems throughout Ethiopia. The project as already mentioned was divided into two. The first phase of this project covers 11 routes including stations connected to Bahir Dar, Addis Ababa, Debre Markos, Dessei, and Mekele Bsc for ZTE and Dire Dawa, Nazareth, Jimma, Lekempt, Shashemene, Arba Minch Bsc for Huawei.

The project was undertaken by outsourcing these routes to two contractors i.e ZTE and HUWAIL.

The nature of the project that can be undertaken on turnkey basis requires all major activities of the project to be undertaken by the supplier.

The procurement document, which clearly explains the responsibilities of all contracting parties, is the Statement of Work. And hence, for this project the responsibilities of the suppliers and the client (ETC) are described below as per the signed Statement of Work. In the next section the responsibilities of the two contracting parties are examined as the knowledge of its framework provides a clear picture of the turnkey's works and also shows project implementation problems.

### **1) Supplier's Responsibilities**

- The design and manufacturer of the equipment must be in compliance with contractual specifications.
- BTS type, Antenna type, feeder cable length and antenna height should be designed according to the information found in the final site survey. BTS locations and coverage plan must be concluded after site survey. Unless additional BTS sites are added by agreement between the purchaser and contractor no additional cost shall be incurred.
- The feeder cable must have the length of the maximum antenna height plus 20m. The feeder cable shall be delivered by drum.
- The supplier must comply with the proposal in his offer for engineering, manufacturing, shipping of the equipment and installation, testing and commissioning for 5 BSC, 5 PDSN 43 BTS, 5 BSC rectifiers, 10 BTS rectifiers and 33 BTS solar power supply.

- The supplier must provide all installation drawings, instruction handbooks, system handbooks, system handbooks and other information required installation operation and maintenance of the equipment.
- The supplier must provide solar array foundation drawings (3 copies) based on soil bearing capacity of 8 ton/ sq.m.
- The supplier must provide earthing material and anchor bolts together with the installation drawings.
- The supplier must be responsible for the methods, techniques, sequences or procedures in connection with the work.
- The supplier must dispatch experienced and qualified engineers from china to do the installation, testing and commissioning works all awarded to the supplier.
- Filed commissioning test items must be offered and test procedures must be supplied before starting the installation.
- During the warranty period, the supplier should provide free of charge repair services in addition the supplier would be responsible for the guarantee obligation as per the contract agreement.
- Installation materials and cables provided must be adequate for the whole project.
- During the warranty period incase of some faulty units the supplier must replace from its own reserve. ETC must not lend any unit from spare part stock.
- Transportation of equipment from Djibouti port to warehouse and from warehouse to specific installation sites must be the responsibility of the supplier.

The site survey must be completed within 20 days of signing a contract.

## 2) ETC's Responsibilities

- The purchaser would assist the supplier in obtaining entry/exit visas, work/residence permits and all other permits as may be required.
- The purchaser would take care of the complete management of his own personnel, facilities and tools. This includes bearing of all boarding, lodging and
- Transportation costs for the purchaser's personnel.
- The purchaser must supply to supplier all the data and information necessary for the development of the final system design.
- The purchaser would take care of all major/minor civil works of construction or modification of the equipment rooms if required.
- The purchaser must provide Alternating Current (AC) power supply where applicable.
- The purchaser will carry out the operation and maintenance of the system according to the maintenance philosophy to be provided by the supplier.
- To carry out these responsibilities and serve as facilitators and supervision, ETC has established project team (office), which is organized (structured) as shown below.

In general the major tasks of the Rural Connectivity Project office of ETC is the accomplishment of BSC and BTS installation as per the schedule set, supervision of all

outsourced companies, coordination and provisions of materials to site for the three companies. Procurement document statement of work (ETC, 2004: 3).

The rural connectivity project organization and RCP Procurement implementation practice has been revealed. The next section documents analysis and interview Results will be reported

## **4.2 Discussions**

### **4.2.1 RCP Procurement Practice**

The RCP project was planned for implementation in two phases: in the first phase ETC planned to ensure at least 5000 rural villages have access to basic telephone service by the end of 1997 E.C. However, the project has not achieved what it set out to accomplish. One of the main reasons is delay in material supply by the outsourced companies.

The result of the interview with procurement staff and regional coordinators reveals that the delivery of the goods that were agreed to be transported by both air and sea planned completion time in days was 60 days from L/C opening. However, this activity is actually delayed by 120 days. Even after their delivery some parts were found to be missing after being transported to the region. Regarding the reason for this difficulty an interview was conducted with D/ Division Manager showing that vendors set the time of delivery or delivery date for winning the bid and signing the contract. Following this the supplier presented various for failure to meet the delivery date.

The information obtained from the interviews and purchase document analyses showed that the supplier was not carrying out its responsibilities per the agreed schedule. On the part of ETC if the outsourced companies fail to act according to their undertaking the Bid Bond they secure should have been taken in favor of ETC. However, ETC has not taken any action; rather the highest degree of patience is being observed.

Following this discussion of the rural connectivity project organization and RCP procurement implementation practice the study turns to RCP cost management practice in detail.

## **4.2.2 Rural Connectivity Project Cost Estimate and Control**

Project cost management begins long before a project starts. Project cost management has its own process from the beginning to its close out. Interview questions are related to the document analysis in the next section.

### **a) RCP Cost planning, Cost Estimate and Cost Control**

**Rural Connectivity Project Cost Planning:** Regarding the question, “How do you determine the resource requirement of a project?” The RCP Project manager replied that he has not participated in the resource determination; rather it was determined by the planning department when the project document was prepared.

The Project Management Document (ETC,2004: 16-17) mentioned that accordingly, one installation team is comprised of 1 ETC technical personnel, 3 TVET graduate, 1 driver and, depending on the situation, 2 daily laborers recruited at the site. Each team is expected to carry out installation and networking of remote equipments, conduct end -to-end test within 3 days and move to the next site within 2 days. At this rate, assuming 120 working days for installation, a total of 125 be required. Resource requirements are summarized as follows: 125 ETC teams, 125 technician, 375 TVET Graduates, 250 laborers, 96 Truck Shuttle Ware-Reg, 9 Truck Reg- Site, Double Cabin (4 wheel), 125 driver are determined for running the resource. Resources are determined based on the expected rural villages and reality of region office.

With respect to who would be responsible for operation of these sites, each site is expected to have 2 operators who would be working on shift basis. These would not be ETC employees but groups that are organized under different local institutions and

reaching agreement with ETC. In total, ETC would provide training to these 6,000 site operators in addition to the installation team members.

Regarding the resource requirement, all the Regional Coordinators said that due to planning problems though 375 TVET (10+2) graduates have been hired as of January 1, 2005 to carry out installation work as the work commenced after some delay and they were earning salary for 7 months being idle.

Regarding the training program which was intended to give training for 6000 site operators all the regional coordinators said that though it had been intended to provide training at different levels and to CPE operators who are about 6000 in number, the training was not conducted due to various reasons, resulting great problem had occurred during the operation.

From this we can deduce that the resource requirement, which was determined in the project management document, was not achieved as intended.

**Rural Connectivity Project Cost Estimate and Control:** As we have seen from the project document (ETC, 2004: 9), projecting the total amount of each cost element constitutes the cost estimate for the overall project. Accordingly, the cost of CDMA-WLL, GSM/GPRS, VSAT, Installation, and Transmission, CPE (customer premise equipment), Local Logistics and other costs are estimated. The estimated amount with the respective cost element is shown in the following table.

**Table 1. Estimated cost for overall project**

| <b>Description</b> | <b>Estimated Costs<br/>(in Million Birr)</b> |
|--------------------|----------------------------------------------|
| CDMA-WLL           | 203                                          |
| GSM/ GPRS          | 2.2                                          |
| VSAT               | 62                                           |
| Training           | 7.7                                          |
| Installation       | 7.3                                          |
| Transmission       | 8.6                                          |
| CPE                | 48                                           |
| Other Costs        | 4                                            |
| Local Logistics    | 55                                           |
| <b>TOTAL</b>       | <b>398</b>                                   |

*Source:* Rural Connectivity project phase I project Management Document Version 1.1(2004: 9)

**Remark: The detailed analysis is annexed. (Annex V) - Summary estimated cost breakdown for RCP.**

When asked how this lump sum figure was reached, the planning section head said that in order to arrive at the total labor cost, the activities, which require intensive labor, have been identified. For these activities both the amount of labor work required and the cost per unit of amount is estimated, by multiplying these amounts the activity cost was derived while adding contingency cost enables arrival at the total cost for labor.

The material cost is projected by estimating the total material needed and cost of material required for the project. Other cost elements are estimated in a similar manner. This approach is similar to top down cost estimate approach and as result there was no detailed work breakdown of activities in projecting the overall cost of the project.

In the implementation phase additional detailed cost estimates are made. These cost estimates are prepared for all activities for which a work order is issued.

By the same token, the overall process of cost estimate for RCP project activities is explained as follows. Once the budget for the project has been approved a survey has been made on each route and the required number of Base Station Center (BSC), Base Terminal Service (BTS), and the number of *Kebeles* that need installation, has been determined. Then for particular activity/activities a project proposal will be prepared by the RCP project office. The project proposal was prepared by experts (program coordinators) who were working in the rural connectivity project.

The project proposal is a support document for a separate work order. The project proposal consists of the following information: project proposal number, title of the project, proposed start and finish date of the activity to be accomplished, a brief description and justification of activities in the proposal, the source of finance referring the item number the project budget has been approved, estimated cost of the activities in the project for material, labor, transportation and other costs. This estimate had a supportive document with details of the estimated costs. The first supportive document consists of description of activities, their measurement unit, quantity, unit price and total price. The summation of this activity total price will give the grand total cost. This document is also supported by detailed estimates of the cost elements (material, labor, transport, and other).

The material cost will be estimated by listing all materials required for the accomplishment of the project activity with their unit of measurement, required quantity unit, and total price in the given project proposal. For the cost element 'labor' also the estimated labor type (skilled, semi-skilled, and unskilled), total number of workers required in each category, their salary per day, total salary per day, total days required and total cost of labor is projected. In a similar manner, for the cost element 'transport' the number and type of vehicles required for the activities and their cost will be estimated. In other items category costs that are expected to be incurred in the

performance of the project activities but that does not belong in the above three categories (material, labor, and transport) will be included and estimated. The cost estimate of all activities in the rural connectivity project is determined in this manner.

Using this estimated cost the work order number will be issued for the activity. The total number of work orders prepared for the rural connectivity project is around 392 among which 11 are for BSC, 94 work orders prepared for BTS, and the remaining 287 work orders prepared for *kebeles* WLL Installation. In summary, the work order contains the following information: a work order number that uniquely identifies the activity/activities included in it, location where the activity/activities takes place, a brief explanation about the activities that will be carried out in the project, the source of finance referring the item number in which the project budget has been approved, proposed start and finish date of the activities in the work order, estimated cost to accomplish the activity/activities in the work order for material, labor, transportation, and other items.

The estimated cost of the RCP project is transferred from the project -approved budget to the zonal/regional office of ETC where the project is executed. When the project is in progress all financial related activities like payment for contract and daily laborers, local material purchase, payment for rental of machines and the like are done through the zonal or regional offices. Each and every payment for the project is tied with a particular work order. These regional/zonal finance sections will record every payment expressing for which work order it is made. The record is made on project expense follow -up card.

For activities to be accomplished the outsourced companies also have a project proposal and work prepared. And when the companies accomplished the required level of activity achievement, both in procurement and physical work as per the agreement in the contract, after confirming the rural connectivity project office will notify ETC's procurement office with authorization to pay; without this document payment for the out sourced companies will not be made.

In all region/zone offices the finance offices will administer the project fund in addition to their normal day-to-day activity. There is no office or person who was responsible for the project activity.

Regarding cost the rural connectivity project did not make follow-ups concerning how much of the allowed budget for the project has been utilized while the project was still in progress. In the progress report the emphasis was upon the accomplishment of activities as per the schedule. The follow-up encompassed the level of performance of activities and with this respect the amount of resources utilized to the date of the report were not taken into account. When making a comparison about how much of the plan was propelled into action in terms of time, the other dimension of utilizing what amount of the resource was not considered. All *Kebele* installation activities are the responsibility of ETC, (i.e. are not outsourced to other companies, either local or foreign). All reports in the *kebele* installation or any other report did not include the level of resource utilization.

All of the six respondents of the cost section confirm that tracking the project costs and accumulating the costs to the work order for which payment is made or material is used was a job left to the zonal/regional office of the corporation. But the rural connectivity project office as project-closing process reports the actual cost of the project for all work orders issued. But the actual cost of the rural connectivity project is not yet determined and compiled. In order to examine the reason, it is necessary to see how the cost of the project is determined in ETC.

The actual cost of the project, the cost that will be capitalized as the cost of the project, is not the one determined by the rural connectivity project office. In response to the question "Is the costing system done centrally?" all of the respondents in the cost section said that the corporation would take the cost accumulated by cost account section (which is responsible for accumulation and determination of all project costs in ETC) as the actual cost of the project.

When asked from “Where, how and when do the cost information of materials, labor and transportation get used? What are the sources documents for those costs?” The cost section head said that the cost section obtained information from different corporate sections: Material from material accounts section, transport data from central garage once in a quarter, and labor from concerned project office once in a month.

In answering the major activities of the central cost account section in the head office all the respondents said that cost account section currently handles the cost accounting process of the corporation. The major process carried out in this section is data analysis and report preparation.

The data analysis consists of the following components:

**Material Cost Analysis** – Input (source data) required for material cost analysis is the store statement that is prepared by material accounts section.

**Labor Cost Analysis** - Carried out once in a month using weekly time sheets and payroll.

**Transport Journal Analysis**- The purpose of this analysis is to allocate costs related with the operation of ETC’s vehicles to capital costs. The analysis is carried out once in a quarter using the transport journal from central garage.

**Other Costs** - These costs cannot be traced to the above cost elements in each works order. These can be payments for electric, power installation, etc.

**Overhead Costs** - Costs such as payments for indirect labor, utilities, supervision, insurance, pension, etc. are an integral part of project costs. However, unlike direct material or direct labor overhead costs cannot conveniently be applied on an individual basis to each project work.

**Work in Progress Analysis** - The purpose of this analysis is to prepare a cost report that rearranges by work orders and cost elements. The analysis is carried out once in a month after the ledger is obtained.

The above data are further analyzed and processed by the cost accounting system and step- by- step different reports are prepared by the section.

However, to see in detail the above function of the cost account section is beyond the scope of this study.

The Central Cost Account Section, which is responsible to prepare the actual cost of the project not implement its function as expected. Some of the major reasons for its incompetence are:

All respondents of the cost section said that the implementing offices give the information on the completed projects to the planning office and the planning office sends the report on the completed projects to the cost account section. But, there is no standard time for this activity. Data comes to the cost office in an untimely fashion. One respondent even said that they accumulate costs in its elements of material, labor, overhead and others and close if the information comes from the project planning and monitoring division and there are instances that costs come after the projects are closed.

All of the respondents of Project Planning and Monitoring Division staff said that the planning and monitoring division, which is responsible to control projects in ETC, is overburdened as currently the number of projects being implemented by the corporation is over three thousands. In order to control all these projects the PMC should be well organized and well staffed. On the contrary, this section is not being organized, is less staffed and less automated.

Out of the seven respondents from the cost section and three of the respondents of the PMC section said that in the project planning and Monitoring Division and Cost Account Section are manual. This leads to unexpected delay in processing the documents.

### **b) RCP Cost Estimation Technique, Work Breakdown Structure and Works Order**

**Cost Estimation Techniques:** Based on the information acquired from the interviews, the cost estimation techniques used in RCP are mostly supported by expertise judgment compiled from experience and past trends from other similar projects. All respondents said that there are no computer-aided tools to estimate project costs except Microsoft Office tools for simple arithmetic, and as a result it hinders the estimation activity as well as its accuracy.

**Work Breakdown Structure:** In RCP the detail cost estimation and work breakdown is done after the budget is approved. As all respondents answered they use WBS after they get the budgeted amount to get the work done. The work breakdown structure of the rural connectivity project is included in the annexes.

**Separate Works Order:** After cost estimation and work breakdown structure has been made the RCP office sent the project proposal to the project planning and support Division to get the separate work order in order to proceed with the work by getting the budget released. A sample separate works order no. 97014/55 and the proposal No. 519/054/97 of Installation of BSC equipment is attached in Annex XIII. The detail has a list of material with its unit, labor, and transport; the material list is attached in annex, the labor and transport cost estimation is presented at the back of the proposal. As discussed, the labor requirement is calculated by using the number of days, daily salary and allowances with the number of personnel required for that project and the transport cost requirement is also calculated by using estimated KM usage and unit cost with the number of vehicles.

### **c) Variance Analyses**

Regarding the question “How do you detect variance? Who is responsible for variance? Is there any feedback system to inform and take actions on variance?” all respondents of the cost section answer are summarized and presented as follows.

Management accounting is the process of identification, measurement, accumulation, analysis, presentation, interpretation and communication of financial information used by management for decision-making (Pandey, 2003: 356). One of the roles of Management Accounts Division in ETC is to provide project cost variance data for management that helps them to make decisions. In ETC variance analysis is done in the accounting system yearly to show the variation between the actual and the estimated cost of the completed projects of each element (material, labor, transport and other). The variances computed in ETC are direct material variance, direct labor variance, transport variance and other variance. These variances are computed by subtracting the estimated or budgeted cost from the actual/applied cost. The variances for materials, labor, transport and other costs are computed in totals without splitting it into price and quantity/efficiency variances.

Hence, the variation between the actual and the estimated cost of the completed projects of each element (material, labor, transport and other) is not presented to the management for decision-making each year. One of the reasons that ETC has not prepared financial reports since 2005 is due to billing and other problems. But, in addition to its tardiness to prepare the report the office doesn't continuously inform results of the variance analysis to the management. Management also does not use the variance analysis output for decision purposes except in asking the concerned offices why these variances occurred. As to this question, only one respondent of the Cost Section answered that it is the duty of Responsibility Accounts Deputy Division under Management Accounts Division, but they didn't perform this function continuously. As a result, only the actual cost is transferred to fixed asset when it is completed without justification and any action. As a

result, the performance of the completed project is not known and is not incorporated into future work as it should be for its valuable lessons.

The corporation has also many weaknesses: there is no project cost management policy and manuals to do uniform cost estimation and accumulation activity, and there is no central cost control office to facilitate the project cost activities from the estimation to the final close out.

As a result, there is no appropriate cost control mechanism to minimize the cost. The application of overhead and material expenses without including them in the project cost estimation is not the correct method as it aggravates the deviation between the actual and the estimated amount.

In a nutshell, cost is not managed effectively throughout the rural connectivity project. The corporation's costs are managed at the central cost account section. However, due to the above mentioned reasons project cost management faced numerous problems.

Though the first phase of the project was completed, the actual cost of the project is not yet known. As a result it is not possible to compare exactly what amounts of money of the estimated amount are utilized for the project. Hence, this hinders project closing activity and asset management. The project assets are not recorded properly, which has a negative impact on insurance case and proper handling of the materials.



### **4.2.3 Rural Connectivity Schedule Progress Monitoring**

In the project management document (ETC, 2004: 8-9) a detailed schedule plan has been prepared. According to the plan, the project start date was at July 15, 2004 and it was to be ended June 30, 2005. The project implementation schedule was prepared using Gantt chart. After the contract has been awarded the outsourced companies have also come up with their own detailed implementation schedule, which is also prepared using Gantt

chart. The outsourced companies are expected to report progress made on a daily, weekly, and monthly basis.

The project, according to the first implementation schedule was to be completed in the Ethiopian budget year 1997/98, through the schedule was re vised the final date of project completion was not changed and higher management bodies have insisted on keeping the project closing date as it is. Because of this, the budget of the project was not transferred to the next year.

There was a strict follow-up by the rural connectivity project office as to the progress of project activities, which were to be accomplished by the outsourced companies and ETC. Both parties are expected to prepare daily, weekly, and monthly progress reports regarding the progress of project activities. The planned and actual work within a given period (week, month, and quarter) was to be compared and the performance in percentage was also expressed. There were various obstacles encountered, which have challenged the accomplishment of activities as per the planned schedule some of these challenges, discovered through interview described as follows:

### **1. Problems on Planning Phase**

- The project has not been thoroughly analyzed during the planning phase.
- Cost breakdown of the whole project was not properly estimated such as labor cost, material cost and logistical costs etc.
- Activities like site survey that has to be performed before issuing the tender were not made and this has resulted in improper cost estimate for each site. In addition, improper site selection was also made in places where transmission and power were not available.

- During the planning/conception stage, ETC did not have complete knowledge of the technology of CDMA and experience as well. As a result, ETC could not prepare exhaustive and detailed technical requirement specification. The specification was expressed in general requirement terms.

***2. Even though the inspection of goods was the responsibility of ETC, there was no organized team responsible for inspection.***

Due to lack of proper inspection instead of importing the purchase goods as per the B.O.Q. the imported goods were different from those indicated on the B.O.Q. Lately, during inspection it was identified that ZTE, one of the outsourced companies, paid B r. 600,000 for alteration of accessories from Dell to Hp. It is also due to lack of proper inspection there were some missing accessories and software that should have been part some of the system.

**3. The Consequence of Unplanned Implementation**

When the wireless telephones were introduced to rural *kebeles*, it has been stated they should be pre-paid in the project management document. There was no method of bill collection for two years since the time they started to provide service until it become pre - paid on April 27, 1999 E.C there is Br. 6,367,446.46 still uncollected. This is due to unplanned implementation problems.

**4. The project was handed over to ETC's main operation with out making the provisional**

**Acceptance Test (PAT).**

Due to various pressures, ETC was in a hurry to implement the project. After the vendors installed BSC and BTS, ETC installed telephone apparatuses and other necessary accessories in *kebeles* without proper handing over taking place. With regard to the

contract, the engineering and coverage works were not completed. The defective works that are not in compliance with the provisions of the contract are listed and given to vendors but still adjustment has not been conducted as stated such that the payment is not due yet and the performance bond was not yet released.

#### 4.2.4 Implementation of Rural Connectivity Project Communication

The rural connectivity project communication was planned to be undertaken in the manner shown in the following table.

**Table 2. Rural Connectivity Project Communication Plan of Action**

| Deliverable/<br>Description         | Type<br>(Mandatory/<br>Information) | Target<br>Audience(s)                       | Delivery<br>Method                                  | Delivery<br>Frequency | Who<br>Responsible?     |
|-------------------------------------|-------------------------------------|---------------------------------------------|-----------------------------------------------------|-----------------------|-------------------------|
| Status Report                       | Mandatory                           | Steering<br>Committee<br>TESD               | Project<br>Status<br>Report<br>template<br>provided | Weekly                | Program Manager         |
| Activity Reports                    | Mandatory                           | Project<br>Managers,<br>Program<br>Managers | Template<br>Provided                                | Weekly                | Project<br>Coordinators |
| Project Status<br>Report<br>Summary | Mandatory                           | Steering<br>Committee<br>TESD               | Template<br>provided                                | Monthly               | Program Manager         |

*Source: Project Management Document Overall Project Follow-up Forms (2004: 27)*

The format proposed to be used as per this plan was the following:

a) **Overall progress manager activity progress reports form.** This form is to be prepared by the program manager to be reported to the steering committee. The information this form contains is the site name, project code, activity performed and remark.

**b) Rural connectivity progress report form.** This form is to be prepared by project managers/ expert & technical support/ program support/ regional /zonal project coordinators reported to program manager. The form was planned to be used for a specific work order among others this form includes site name, project code, activity performed and remark.

**c) Rural connectivity progress reports form on training.** This form is to be prepared by planning & development/ regional/ zonal training coordinators for training purpose. The following information is to be communicated using this form: training site name, description, number of trainees, trainee weeks and remark.

**Project status report (summary) form.** To be prepared by overall program manager and reported to steering committee. The content of this form includes major milestones and their target completion date and status at the report date and budget status of the milestones.

**e) Project status report form.** This form was to be prepared on a monthly basis and was supposed to highlight the overall status of the project. The form consists of questions that are to be answered by the overall project manager on a yes or no basis. One of the questions is “Will the project will be completed on time and within budget.”

**f) Team supervisors progress report form.** This form is to be prepared by regional/ zonal project coordinators and reported to team supervisors. The form is to be prepared to each installation *kebeles*. The following information is to be communicated using this form: planned starting and completion date of installation, problem observed, and confirmation regarding the completion of activities in a timely fashion.

**g) Rural connectivity project issue submission form .** This is the form used to describe the issue assigned to assess the project impact and its resolution.

**h) Rural connectivity project issue log .** This is used to issue description and impact of the project.

**g) Program manager progress report form used by program manager .** In this report the program manager described site name, project code and activity performed in a summary form to the steering committee on a weekly basis. The steering committee evaluated the progress of the project using this summary and also gives some direction on it.

**f) Rural connectivity project progress report form .** This report is the same as the program manager progress report form used by program manager. The only difference is that the report is prepared by experts, project co-coordinators and regional/ zonal RCP coordinators to report to RCP program manager. In this report site name, project code and activity performed are included.

**e) Rural Connectivity progress reports form on training.** This report is to be prepared by training co-coordinators for training purpose. The following information is to be communicated using this form: training site name, description, number of trainees, trainee weeks and remark. However, this report was not implemented in the project implementation. As we mentioned in the project organization training activity was to be implemented by the ETC operation i.e training and development Division rather than in the project. So that this report has not been prepared by RCP office.

**d) The progress status report and the progress report forms .** These are used for monitoring and control purpose prepared on a weekly basis. All the outsourced companies and ETC project managers present the weekly progress report to the rural connectivity project office. The basic information in the progress report included the number of BSC installed, the number of BTS and number of *kebeles* which had connection and achievement in percentage both for current week and total planned. But these reports did not include any cost information. From these reports the planned and actual accomplishment of activities can be compared. This has created awareness with

regard to schedule monitoring of the project to take corrective action for deviation from the plan by addressing the problemscausing variation. These reports will be compiled by the overall program manager and will be presented to the steering committee. However, later on, the steering committee was replaced by telecom engineering service and the report was presented to this office among other projects under the control of this office.

**u) Team supervisors progress report form .** This form is prepared for each installation *kebeles*. and includes planned starting and completion date of installation, problem observed, and confirmation regarding the timely completion of activities. This report was widely used in the implementation phase of the project. Each installation team reported to the regional/zonal coordinators as soon as the work was completed.

Unfortunately issue submission form and project issue log have not been practically used. The given reason for this situation is the form's being new and having never been used by the corporation on other projects, and as such the employees are unfamiliar with them. Additionally these forms are difficult to express progress in objective units. But if they were applied these forms have the advantage of following -up progress on every work order and there were also a consideration given to project issues in detail.

In general, the rural connectivity project has a good communication plan. The plan is very effective in the implementation phase. However, some report formats proposed in the planning phase were not implemented. Therefore, during the second phase these forms will be utilized.

### **4.3 Findings of the Research**

The following are the major research findings the researcher has obtained during the research. These findings are to be classified in the following major sections.

#### **A) Monitoring and Controlling of RCP Project Schedules**

- The application of project management tools and techniques is limited to Gantt chart. Application of other project management tools and techniques is not used in the project management process.
- In the project progress monitoring and control reports comparison of the actual and planned progress, the amount of resources consumed was not included.
- The program manager of the Rural Connectivity Project only concentrates on the number of *kebeles* obtaining connection. Rather full attention was not given for the whole performance of the project.

#### **B) RCP Communication Process**

- In progress reports some formats such as issue submission form and issue log have not been used in the first phase of the project. Since these forms enable comparison of actual and planned costs of the project these issues have not been properly addressed.
- There was not any formal progress meeting conducted in the rural connectivity project teams. There was also no specific date set for the meeting. Due to that the Rural Connectivity Project lacks effective examination of all matters related to keeping the project on schedule.

#### **C) Estimating and Controlling of Project Costs**

- There is no project cost management policy and manuals to conduct uniform cost estimation and accumulation activity in the corporation.
- There is no central cost control office to facilitate the project cost activities from the estimation to the final close out.

- Currently, project costs are recorded into cost account ledgers after a minimum of one year following the transactions' occurrences. As a result, the input data supplying office has significant difficulty in collecting the cost information manually and in providing timely and accurate data to cost accounts processing.
- There is lack of coordination among the implementing offices with the cost section to exchange necessary information, hence cost estimation and accumulation is currently negatively affected by unsynchronized work of each office.

The above-related problems associated with corporate cost management practices have direct impacts on the rural connectivity project. Due to these drawbacks the process of both estimating and controlling project costs of the rural connectivity project efficiency is hampered. In addition to the above problems related with the basic research questions, there are also numerous problems found in the RCP project implementation practice of ETC. Some of the findings obtained from the secondary data and interview are listed as follows:

#### **D) Problems Related with Implementation**

- RCP is initiated without proper technical and economic feasibility studies or recommendations;
- Lack of intensive planning discussion or weak participation of user departments;
- Poor attention and weak power to take actions to close work orders of completed projects timely;
- Excessive delay of custom clearing processes;
- Delays in delivering purchased goods to the warehouse;
- Failure to integrate or manage resources efficiently and effectively (Labor, Material, Transport and Finance);
- Lack of due attention to project start and completion dates when preparing project proposals;

- Lack of concern to make accurate cost estimations (material, labor, transport, etc.) for almost all types of projects ;
- No formal project team and undefined roles and responsibilities of each team member;
- Very little attention to formal closing reports of projects;
- Lack of appropriate project management skill;
- No formal signing-off procedure of completed projects;
- No project implementation procedure or standard manual;

#### **E) General Directions**

- Ethiopia used only its only sole government telecom operator for rural telecom expansion. However, from other countries' success stories, we have learnt that Ethiopia should introduce different mechanisms for rural telecom expansion.



# *Chapter Five*

## **Conclusion and Recommendations**

### **5.1. Conclusion**

The purpose of this study is to explore Ethiopian Telecommunication Corporation's (ETC) project management practice in the Rural Connectivity Project to enhance its capacity of project management implementation practice. Accordingly, this research is aimed at answering the following research questions pertaining to ETC's Rural Connectivity Project:

1. How were the monitoring and controlling of project schedule conducted?
2. How were the processes of both estimating and controlling project costs carried out?
3. How valuable was the communication process among different stakeholders while implementing the project?

To investigate these research questions, 13 RCP employees (1 program manager, 3 project coordinators, 1 logistic coordinator, 8 regional coordinators), 7 cost section head and staffs, 3 procurement section head and staffs and 3 planning and monitoring control section head and staffs were selected and interviewed. Data collected through interviews and reviewing company documents are presented in the previous chapter. This chapter presents conclusions and recommendations.

Universal access refers to the scenario in which everyone in a community can gain access to a publicly available telephone. Any member of the country has the right to gain access to telephone service and this has also been taken as an obligation for each country. Each country tries to reach society through different mechanisms.

The Rural Connectivity Project (RCP) has been operating under the guidelines of Agricultural Development Led Industrialization (ADLI) policy. This strategy is essentially based on the belief that national development could only be achieved if rural communities play a role and are made beneficiaries of this process. Ethiopian Telecommunications Corporation, as the sole telecom service provider in the country, is shouldered with the responsibility of addressing this issue.

The government and ETC have agreed on the need for the provision of nationwide communications coverage at “*Kebele*” level through nationwide communications encompassed in the Rural Connectivity Project. The first phase of the project was planned to cover 5000 of the estimated more than 15,000 “*kebeles*” in 1997 EFY with the remaining 10,000 follow in 1998. However, it has only provided access to 6972 rural *kebeles* in 2000 EFY.

This project has utilized significant resources totally around 398 million birr as per the budget involved as well as a workforce of 875 and two international companies (ZTE and HUWAI). The project was undertaken by sharing activities among ETC and these companies. ETC’s major responsibility was handling the installation work at *kebele* level and implementing, monitoring and controlling the overall project. As per the schedule and specification the outsourced companies were responsible for engineering, manufacturing, shipping of the equipment and installation, testing and commissioning for BSC, PDSN, BTS, BSC rectifiers and solar power supply as per the schedule and specification.

The cost of the project was estimated at two levels. First, the project cost was estimated for the overall project with no detailed work breakdown, but at the implementation stage the costs are further estimated in detail for every activity in the project. Similar to any other project of ETC, there was no attempt made to compare the actual and estimated cost of this project. Even though the first phase of the project has almost been completed and the project has been operational, the actual cost is not known yet. The project cost monitoring methods discussed in chapter two were not practiced in their entirety.

As discussed in chapter two, any project has its own life cycle. However, even though the rural connectivity project has been completed and become operational, the project still has not been formally closed up at present.

The follow-up to the project progress was made on weekly and daily bases as per the timetable. The actual and planned progress of the project was regularly reported to the rural connectivity project office situated at the head office from regional project coordinators. This report will be compiled and presented for the steering committee by the overall program manager.

There were various obstacles, which have challenged the successful implementation of activities as per the planned schedule. Some of these challenges are: problems in the planning phase, Delay in material supply by the outsourced companies, lack of an organized team for inspection, absence of clearly specified duties and responsibilities and no project close out, testing, ad commissioning handover proposal.

Even though the above-mentioned problems were present in the rural connectivity project, the output of the project has brought a positive impact on the country's economy and life of peasants. ETC should correct problems in the second phase of the project and become more effective in the future.

## **5.2. Recommendations**

Based on the result of the analysis, findings and conclusions, the following recommendations are forwarded to the corporation for its improvement in project management implementation practice in its future operations. These recommendations are to be classified in the following major sections.

### **A) Project Schedule Monitoring and Controlling**

1) The application of project management tools and techniques is limited to Gantt chart. Application of other project management tools and techniques like critical path method, program evaluation and review techniques, as well as earned value analysis as appropriate will facilitate the project management process. To do this, project management training for the concerned project managers is mandatory.

2) In the project progress monitoring and control the follow-up cost should be considered. In the reports, when comparing the actual and planned progress, the amount of resources consumed also has to be included. Tracking of costs against approved budgets and recording of physical completion of project milestones shall be implemented at full scale in the next phase of the project.

### **B) RCP Communication Process**

3) In progress reports using graphs will improve communication in terms of the actual progress of the project with respect to the plan. The proposed report formats that have not been used in the first phase can be utilized for the second phase of the project. Since these forms enable follow-up progress for each work order, and also provide mechanisms to compare actual and planned cost of the project they will aid in proper management.

### **C) RCP Costs Estimating and Controlling**

4) Currently the implementing offices are estimating the cost of the project, but there should be a separate project cost estimation and control office to segregate the duties that can assist and control them.

5) There must be variances investigation and detection procedures at the time of project completion to take corrective actions and integrate lessons for other projects. The justification for cost variation of the completed projects should be documented in order to incorporate lessons for future similar project activities.

**D) General RCP Implementation Practice**

6) ETC should develop modern and integrated project management systems and procedures. Computerized project cost management software should be implemented in order to get accurate and timely estimates. ETC shall establish electronic data storage media and shall also create access to all concerned departments.

7) Project handover shall be formally conducted between the internal contractor and the concerned user department and witnessed by the planning office. All completed projects shall be closed out and reported to CPBD, CFD and concerned business department(s) for clearance and registration as fixed assets.

8) ETC has taken its project seriously. It should critically control its project implementation through modern project management principles. ETC shall continuously engage in staff capacity building through training and workshops in the field of project management in order to promote competence and /or skills.

9) The Ethiopian Government, in order to achieve rural communication, only uses its sole telecom operator's. i.e. Ethiopian Telecommunications Corporation. However, in order to achieve its target it should encourage private operators to participate in the activity by undertaking different reforms. This lesson is taken from those countries that have experienced success in rural telecommunication expansion.

Generally, the corporation needs to build the project management systems by giving necessary training to the implementing offices and facilitate for acquaintance with the relevant practices of other similar industries. It would also be helpful to study the other pillars, schedule and performance, to have effective project management, which will in turn will have a positive impact on project implementation. The researcher strongly believes that all the recommendations given above will certainly contribute towards efficient project implementation, which would enable the organization to implement its projects within the targeted cost and time that enable it to provide appropriate services to the customers at the lowest price possible.

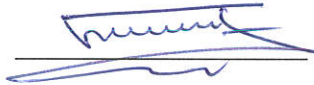
## Declaration

I, the undersigned, declare that this thesis is my original work and has not been presented for a degree in any other university. Besides that all sources of materials used for the thesis have been duly acknowledged.

Declared by:

Name Habtamu Fantaye

Signature

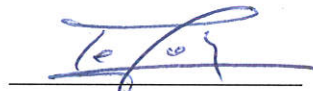


Date 14 July 2008

Confirmed by advisor:

Name Teferi Regassa (Asst.Prof.)

Signature



Date

04 July 2008

Addis Ababa, Ethiopia

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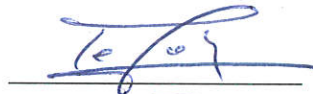


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## ANNEXES

### Annex I

#### **Interview Questions for Rural Connectivity Project Manager/ Concerned Bodies**

These interview questions are prepared by Habtamu Fantaye, a MPA 2<sup>nd</sup> year student in Addis Ababa University (AAU), for the partial fulfillment of the program by doing “PROJECT MANAGEMENT IMPLEMENTATION PRACTICE IN ETC - THE CASE OF RURAL CONNECTIVITY PROJECT” research in ETC. Your responses to the following questions are valuable for the researcher in order to fulfill the academic requirement and it will also be important for ETC for its future project operation. Your genuine response is highly appreciated and has great contribution, and I would like to thank you in advance for your cooperation.

- 1) What is your current position in the organization? And your total work experience? Your educational level and field?
- 2) How do you determine the resource requirement of a project?
- 3) Who estimated the cost of the project? When is the estimate made in the project life cycle?
- 4) What methods are used in the estimate process? Do you use computer-aided tools in order to estimate the cost?
- 5) At what point (like milestones) does the project estimate cost is compared with the actual cost of the project what method/s are used for this purpose? Graphs, tables, Gant charts, earned value other please specify
- 6) Is there any significant difference? What action has been taken for such happening?
- 7) Is the estimate cost of the project has been revised at the implementation phase if yes how many times
- 8) What technique/method is used for schedule activities (Gant, PERT, CPM, Critical chain scheduling)?
- 9) What method has been used to estimate made for each activity (bottom up, top down etc)

- 10) Who estimated the activity time of the project? When is the estimate made in the project life cycle?
- 11) At what point (like milestones) does the project time estimate is compared with the actual time take for the accomplishment of the activity of the project what method/s are used for this purpose? Graphs, tables, Gant charts, PERT, CPM other please specify
- 12) Is there any significant difference? What action has been taken for such happening?
- 13) Is the estimate time of the project has been revised at the implementation phase if yes how many times
- 14) What is the reason behind the gap (estimate & actual) if any - optimistic estimate, unexpected happening etc
- 15) Is there any feedback system to inform and take actions on variances? How do you justify variances if there is any? Who is responsible for the variance?
- 16) How often progress meeting takes place (among the project team)? On average how long did each meeting take?
- 17) If there was a need to revise a schedule on such meetings did the new schedule be expressed explicitly?
- 18) Did minutes have been taken for such meeting? If so what are the contents (sample)
- 19) What kind of reports did generate for progress report (routine, exception, special analysis?)
- 20) What do you observe the over all RCP project compared with the other ETC project? What are its strength and its weakness?

**Thank You,**

## **Annex II**

### **Interviewee over all program manager of RCP (Rural Connectivity Project)**

These interview questions are prepared by Habtamu Fantaye, a MPA 2<sup>nd</sup> year student in Addis Ababa University (AAU), for the partial fulfillment of the program by doing “PROJECT MANAGEMENT IMPLEMENTATION PRACTICE IN ETC - THE CASE OF RURAL CONNECTIVITY PROJECT” research in ETC. Your responses for the following questions are valuable for the researcher in order to fulfill the academic requirement and it will also be important for ETC for its future project operation. Your genuine response is highly appreciated and has great contribution, and I would like to thank you in advance for your cooperation.

- 1) What is the Objective of the project?
- 2) To what extent higher-level management support the Project? Is there any action plan document which shows support?
- 3) How do you determine the resource requirement of a project?
- 4) Who estimated the cost of the project? When is the estimate made in the project life cycle?
- 5) What methods are used in the estimate process? Do you use computer -aided tools in order to estimate the cost?
- 6) What are ETC's roles in the project implementation phase? What activities are done by ETC?
- 7) What are the major difficulties faced in the implementation phase?
- 8) How do you see the overall outcome of the project? As per the criteria set in the plan was the project successful?
- 9) The total number of ETC employees participated in RCP? Daily laborers? Contractor companies?
- 10) The total number of work order issued for the RCP? Kick off meeting
- 11) Did minutes have been taken for such meeting? If so what are the contents (sample)
- 12) What kind of reports did generate for progress report ? (routine, exception, special analysis)

13) What is/are the things which you want to do differently in the second phase of the project? (Lessons learned)

14) What do you observe the overall RCP project compared with the other ETC project? What are its strength and its weakness?

**Thank You,**

## **Annex III**

### **Interview Questions for Head Office Cost Account Section of ETC**

These interview questions are prepared by Habtamu Fantaye, a MPA 2<sup>nd</sup> year student in Addis Ababa University (AAU), for the partial fulfillment of the program by doing “PROJECT MANAGEMENT IMPLEMENTATION PRACTICE IN ETC - THE CASE OF RURAL CONNECTIVITY PROJECT” research in ETC. Your responses for the following questions are valuable for the researcher in order to fulfill the academic requirement and it will also be important for ETC for its future project operation. Your genuine response is highly appreciated and has great contribution, and I would like to thank you in advance for your cooperation.

- 1) What is your current position in the organization? And your total work experience? Your educational level and field? What specific task are you currently performing?
- 2) Which cost accumulation and allocation process does ETC use?
- 3) Does ETC have cost accounting policies and procedures for projects to control? If there is, what do they constitute in brief?
- 4) From where do you get the cost information of materials, labor and transportation used? What are the source documents for those costs?
- 5) How does this section manage costs throughout the life of a project?
- 6) For what objects (expenditures) does this section accumulate costs? Is the costing system done centrally?
- 7) How and when do you get cost information? And how do you follow-up to get timely cost information?
- 8) Is there any automation system to facilitate the cost accumulation process and in order to communicate with the concerned offices? If not, what problems do you encounter to accumulate costs and to get timely information?
- 9) How do you detect variances, what are the techniques used for this process and what are you doing to correct the variances? Who is responsible for the variance? How do you inform to the concerned offices?
- 10) Is there any feedback system to inform and take actions on variances?

11) What kind of action this section going to make to reduce the cost? And how is the response for that?

12) What kind of reports does this section produce? And in what interval for managerial decision-making? How is this information helpful for managers to make timely decisions?

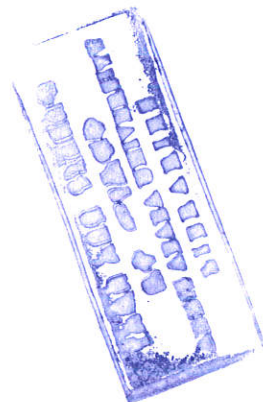
13) What are the closing procedures of the completed projects? And how does the section get this information?

14) What is the relationship of this section with the project offices in order to get the necessary cost data?

15) How do you evaluate the overall cost management system of ETC?

16) What do you comment for the future in costing system of ETC?

**Thank You,**



## Annex IV

**Table 1.**

### **Rural Connectivity Project Employees Interviews Profile**

**Table 4**

| Division             | Position               | Field                                    | Experience      |
|----------------------|------------------------|------------------------------------------|-----------------|
| Program Manager      | Assistance Expert      | Tele Institute Graduate                  | 30 years in ETC |
| Project Coordinator  | Electrical Engineer    | B.sc in Electrical Engineering           | 5 years         |
| “                    | Technician             | Diploma in Electricity                   | 23 years        |
| “                    | J/ Electrical Engineer | B.sc in Electrical Engineering           | 3 years         |
| Logistic Coordinator | Store Keeper           | College Diploma in Purchasing Management | 12 years        |
| Regional Coordinator | Team Leader            | B.sc in Electrical engineering           | 5 years         |
| “                    | D/R/ Manager           | Diploma in Electricity                   | 19 years        |
| “                    | Section Head           | Diploma in Computer Science              | 17 years        |
| “                    | D/R/Manager            | B.sc in Electrical Eng.                  | 5 years         |
| “                    | Section Head           | Electrical Technology Diploma            | 8 years         |
| Regional Coordinator | Section Head           | Diploma in Electricity                   | 11 years        |
| “                    | D/Reg. Manager         | Advance Diploma in Electrical Technology | 8 years         |
| “                    | “ II                   | Diploma in Civil Eng..                   | 11 years        |

**Table 5.****Cost Section Interviewee Profile**

| <b>Position</b> | <b>Field</b>               | <b>Experience</b> |
|-----------------|----------------------------|-------------------|
| Accountant      | B.A Degree in Accounting   | 5 years           |
| S/ Section Head | Diploma in Marketing       | 27 “              |
| HR Officer      | BA Degree in Business Mgt. | 6 “               |
| Accountant      | BA Degree in Accounting    | 2 “               |
| D/D Manager     | “                          | 21 “              |
| Team Leader     | Diploma in Accounting      | 8 “               |
| Accountant      | B.A Degree in Accounting   | 8 “               |

**Table 6****Procurement Section Interviewee Profile**

| <b>Position</b> | <b>Field</b>               | <b>Experience</b> |
|-----------------|----------------------------|-------------------|
| D/Div. Manager  | B.A Degree in Management   | 12 years          |
| J/MR. Officer   | B.A Degree in Management   | 3 “               |
| HR Officer      | BA Degree in Business Mgt. | 6 “               |

**Table 7****Planning and Monitoring Control Section Interview Profile**

| <b>Position</b>                        | <b>Field</b>            | <b>Experience</b> |
|----------------------------------------|-------------------------|-------------------|
| Department.<br>Manager                 | B.A Degree in Economics | 6 years           |
| Administrative<br>Assistance           | Diploma in Statistics   | 27 “              |
| Senior<br>Administrative<br>Assistance | Diploma in Marketing    | 25 “              |

# WORK REPORT

Report below the number of days used for work under the respective headings, further about Transportation and also about the relation of the actual work to the planned one.

## LABOUR

| KIND OF WORK |                                                                                                                                               |      |
|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------|------|
| 1.           | Planning work                                                                                                                                 |      |
| 2.           | Line and net work<br>(Comprises digging of pole holes, setting of poles, hanging of aerial cable, stringing of wire etc.)                     |      |
| 3.           | Digging for and laying of underground cable                                                                                                   |      |
| 4.           | Joining                                                                                                                                       |      |
| 5.           | Subscriber installation<br>(Comprises Installation of any type of telephones and PBX: s and also preparatory installation in large buldings.) |      |
| 6.           | Public exchange installation                                                                                                                  |      |
| 7.           | Carrier installation                                                                                                                          |      |
| 8.           | Radio station installation<br>(8.1) Antenna 3 x 140 x 4                                                                                       | 1680 |
| 9.           | Building construction<br>(8.2) <del>structure for truck</del> 1 x 108 x 4                                                                     | 432  |
| 10.          | Other work<br>(8.3) structure for truck 1 x 115 x 4                                                                                           | 460  |
| TOTAL        |                                                                                                                                               | 2572 |

## TRANSPORTATION

| Number and type of vehicles used | Number of days used | Kms. run |
|----------------------------------|---------------------|----------|
| pic-up                           | 4                   | 1552     |
| truck                            | 4                   | 1020     |

## WORK'S RELATION TO PLAN

Was the work carried out according to the plan? If not explain here any deviation and the reason for it.

material = 428,975.80  
 Labours = 2572.00  
 Contract Labours = 97,320.00  
 Transport = 9462.28  
 Others = 300.92

Total = 529,168.72

@ 1500  
 2000/1500



# SEPARATE WORKS ORDER No. 97014/88

To: TESD - RCP Project Office

I hereby requested to carry out the following work

### Gara Beteria BTS Site - NWR

Installation of BTS Equipment and Solar power with accessories at Gara Beteria in NWR in order to provide telephone/voice, Internet, FAX/data, and ICT services for rural kebeles.

Note:- It is to be financed from budget of 1997 E.F.Y. Item No. 2

Valid (acc. to Estimate) : 29/04/05 - 04/05/05

Refer to Project Proposal No 519/087/97 of 10/02/05

| COSTS ACCORDING TO ESTIMATE IN (ETHIOPIAN Birr RS) |            |            |                |             |            |                     |
|----------------------------------------------------|------------|------------|----------------|-------------|------------|---------------------|
| Account number                                     | Materials  | Labour     | Transportation | Other Items | Total      | Materials recovered |
|                                                    | 428,975.80 | 101,178.00 | 9,467.28       | 300.92      | 539,922.00 |                     |
| Total                                              | 428,975.80 | 101,178.00 | 9,467.28       | 300.92      | 539,922.00 |                     |

| Action Taken                                     |       |                    | Documents attached when order issued     | Copies of this order sent to :                                       |
|--------------------------------------------------|-------|--------------------|------------------------------------------|----------------------------------------------------------------------|
|                                                  | Dates | Initials           |                                          |                                                                      |
| Placed in order magazine                         |       |                    | Project Cost Estimate No.<br>PCE/1647/97 | Mat. Mgt. Div.<br>Treas. Div.<br>PM&SD<br>TS & MD<br>Mgt A/cs<br>NWR |
| Planned                                          |       |                    |                                          |                                                                      |
| Inserted in the plan                             |       |                    |                                          |                                                                      |
| Materials requisitioned                          |       |                    |                                          |                                                                      |
| Work started <u>5/08/06</u>                      |       | <i>[Signature]</i> |                                          |                                                                      |
| Work completed <u>8/20/06</u>                    |       | <i>[Signature]</i> |                                          |                                                                      |
| Work inspected                                   |       |                    |                                          |                                                                      |
| Order and attached documents filed at Headoffice |       |                    |                                          |                                                                      |

Addis Ababa, February 26, 2005  
**For the General Manager**  
*[Signature]*  
 Worku Bogale  
 T/Project Management & Support  
 Division Manager

### Completion of the work:

Return this order and attached documents to Headoffice :  
 Report about the work on the back of this order; if actual days or actual costs differ from Estimate.  
 Give reasons for this.

## Annex 6.4: All Foreseeable RCP Costs Included

## Summary Estimated Cost Breakdown for Rural Connectivity Project (All Foreseeable RCP Costs Included)

| Item No.                                    | Description                            | Unit | Required Amount | Est. Unit Price (USD) | Est. Unit Price (Birr) | Unit Cost + Contingency (10%) | Total Est. Budget |                | Total Est. Budget | Remark                                            |
|---------------------------------------------|----------------------------------------|------|-----------------|-----------------------|------------------------|-------------------------------|-------------------|----------------|-------------------|---------------------------------------------------|
|                                             |                                        |      |                 |                       |                        |                               | Phase I           | Phase II       |                   |                                                   |
| <b>1. PSTN Upgrading Cost</b>               |                                        |      |                 |                       |                        |                               | Phase I           | Phase II       | RCP Total         |                                                   |
|                                             |                                        |      |                 |                       |                        |                               | 962,500.00        | -              | 962,500.00        |                                                   |
| 1                                           | V 5.2 Feature                          | -    | 1               | 100,000.00            | 875,000.00             | 962,500.00                    | 2,310,000.00      | 4,620,000.00   | 6,930,000.00      | 200% of P-I in P-II                               |
| 2                                           | E-1 Interface                          | -    | 80              | 3,000.00              | 26,250.00              | 28,875.00                     | 3,272,500.00      | 4,620,000.00   | 7,892,500.00      |                                                   |
| PSTN Sub Total                              |                                        |      |                 |                       |                        |                               |                   |                |                   |                                                   |
| <b>1. CDMA - WLL Cost (For 2,500 Sites)</b> |                                        |      |                 |                       |                        |                               | Phase I           | Phase II       | RCP Total         |                                                   |
|                                             |                                        |      |                 |                       |                        |                               | 8,662,500.00      | 4,331,250.00   | 12,993,750.00     | 50% of P-I in P-II                                |
| 1                                           | BSC                                    | Pcs  | 10              | 90,000.00             | 787,500.00             | 866,250.00                    | 88,935,000.00     | 44,467,500.00  | 133,402,500.00    | 50% of P-I in P-II                                |
| 2                                           | BTS                                    | Pcs  | 84              | 110,000.00            | 962,500.00             | 1,058,750.00                  | 2,425,500.00      | 1,212,750.00   | 3,638,250.00      | 50% of P-I in P-II                                |
| 3                                           | Antenna & Feeder (Three Face)          | Pcs  | 84              | 3,000.00              | 26,250.00              | 28,875.00                     | 14,437,500.00     | 7,218,750.00   | 21,656,250.00     | 50% of P-I in P-II                                |
| 4                                           | PDSN                                   | Pcs  | 10              | 150,000.00            | 1,312,500.00           | 1,443,750.00                  | 3,007,812.50      | 1,503,906.25   | 4,511,718.75      | 50% of P-I in P-II                                |
| 5                                           | Operation & Maintenance Centre         | Pcs  | 10              | 31,250.00             | 273,437.50             | 300,787.25                    | 75,075,000.00     | 37,537,500.00  | 112,612,500.00    | 50% of P-I in P-II                                |
| 6                                           | Power Equipment (Solar Cell & Battery) | Pcs  | 52              | 150,000.00            | 1,312,500.00           | 1,443,750.00                  | 10,106,250.00     | 5,053,125.00   | 15,159,375.00     | 50% of P-I in P-II                                |
| 7                                           | Rectifier & Battery                    | Pcs  | 42              | 25,000.00             | 218,750.00             | 240,625.00                    | 202,649,562.50    | 101,324,781.25 | 303,974,343.75    |                                                   |
| CDMA - WLL Sub Total                        |                                        |      |                 |                       |                        |                               |                   |                |                   |                                                   |
| <b>2. GSM/GPRS Cost (For 200 Sites)</b>     |                                        |      |                 |                       |                        |                               | Phase I           | Phase II       | RCP Total         |                                                   |
|                                             |                                        |      |                 |                       |                        |                               | 2,241,710.63      | -              | 2,241,710.63      |                                                   |
| 1                                           | S22 to S444 Reconfiguration            | Pcs  | 15              | 15,527.00             | 135,861.25             | 149,447.38                    | 2,241,710.63      | -              | 2,241,710.63      |                                                   |
| GSM/GPRS Sub Total                          |                                        |      |                 |                       |                        |                               |                   |                |                   |                                                   |
| <b>3. VSAT Cost (For 330 Sites)</b>         |                                        |      |                 |                       |                        |                               | Phase I           | Phase II       | RCP Total         |                                                   |
|                                             |                                        |      |                 |                       |                        |                               | 20,175,540.00     | 30,569,000.00  | 50,744,540.00     | 500 in P-II                                       |
| 1                                           | Remote VSAT Station Equipment          | Pcs  | 330             | 6,352.00              | 55,580.00              | 61,138.00                     | 17,787,000.00     | 26,950,000.00  | 44,737,000.00     | 500 in P-II                                       |
| 2                                           | Remote VSAT Power                      | Pcs  | 330             | 5,600.00              | 49,000.00              | 53,900.00                     | 19,071,485.13     | 9,535,742.56   | 28,607,227.69     | 50% of P-I in P-II                                |
| 3                                           | Hub Expansion Cost                     | -    | 1               | 1,981,453.00          | 17,337,713.75          | 19,071,485.13                 | 4,764,375.00      | 2,382,187.50   | 7,146,562.50      | 50% of P-I in P-II                                |
| 4                                           | AC-UPS System                          | Pcs  | 330             | 1,500.00              | 13,125.00              | 14,437.50                     | 61,798,400.13     | 69,436,930.06  | 131,235,330.19    |                                                   |
| VSAT Sub Total                              |                                        |      |                 |                       |                        |                               |                   |                |                   |                                                   |
| <b>4. Training Cost</b>                     |                                        |      |                 |                       |                        |                               | Phase I           | Phase II       | RCP Total         |                                                   |
|                                             |                                        |      |                 |                       |                        |                               | 7,700,000.00      | 46,200,000.00  | 53,900,000.00     | 42,000 in P-II                                    |
| 1                                           | Cost Per Participant                   | -    | 7000            | -                     | 1,000.00               | 1,100.00                      | 7,700,000.00      | 46,200,000.00  | 53,900,000.00     |                                                   |
| PSTN Sub Total                              |                                        |      |                 |                       |                        |                               |                   |                |                   |                                                   |
| <b>5. Installation Cost</b>                 |                                        |      |                 |                       |                        |                               | Phase I           | Phase II       | RCP Total         |                                                   |
|                                             |                                        |      |                 |                       |                        |                               | 2,697,750.00      | 13,488,750.00  | 16,186,500.00     | 200 Kms/ Site for Pickup & 50Kms/ Site Truck Each |
| 1                                           | Transportation                         | -    | 3000            | -                     | 817.50                 | 899.25                        | 4,200,000.00      | 13,860,000.00  | 18,480,000.00     | 3 x P-I in P-II                                   |
| 2                                           | Salary & Benefits                      | -    | Total           | -                     | 4,200,817.50           | 4,620,899.25                  | 7,317,750.00      | 27,348,750.00  | 34,666,500.00     |                                                   |
| Installation Sub Total                      |                                        |      |                 |                       |                        |                               |                   |                |                   |                                                   |
| <b>6. Transmission Cost</b>                 |                                        |      |                 |                       |                        |                               | Phase I           | Phase II       | RCP Total         |                                                   |
|                                             |                                        |      |                 |                       |                        |                               | 8,662,500.00      | 17,325,000.00  | 25,987,500.00     | 2 X P-I in P-II                                   |
| 1                                           | Transmission Expansion                 | -    | 1               | 900,000.00            | 7,875,000.00           | 8,662,500.00                  | 8,662,500.00      | 17,325,000.00  | 25,987,500.00     |                                                   |
| Installation Sub Total                      |                                        |      |                 |                       |                        |                               |                   |                |                   |                                                   |
| <b>7. CPE Cost (For 3,000 Sites)</b>        |                                        |      |                 |                       |                        |                               | Phase I           | Phase II       | RCP Total         |                                                   |
|                                             |                                        |      |                 |                       |                        |                               | 1,443,750.00      | 7,218,750.00   | 8,662,500.00      | 15K in P-II                                       |
| 1                                           | Payphone                               | Pcs  | 3000            | 50.00                 | 437.50                 | 481.25                        | 28,875,000.00     | 144,375,000.00 | 173,250,000.00    | 15K in P-II                                       |
| 2                                           | Desktop Computer                       | Pcs  | 3000            | 1,000.00              | 8,750.00               | 9,625.00                      | 14,437,500.00     | 72,187,500.00  | 86,625,000.00     | 15K in P-II                                       |
| 3                                           | Integrated Fax                         | Pcs  | 3000            | 500.00                | 4,375.00               | 4,812.50                      | 385,000.00        | 3,850,000.00   | 4,235,000.00      | 2K in P-II                                        |
| 2                                           | GSM/GPRS Module With RS232 Interface   | Pcs  | 200             | 200.00                | 1,750.00               | 1,925.00                      | 7,218,750.00      | 37,537,500.00  | 44,756,250.00     | 12.5K in P-II                                     |
| 3                                           | CDMA-WLL Fixed Interface               | Pcs  | 2500            | 300.00                | 2,625.00               | 2,887.50                      | 38,981,250.00     | 216,562,500.00 | 255,543,750.00    | 15,000 in P-II                                    |
| 4                                           | Power Equipment (Solar Cell & Battery) | Pcs  | 2700            | 1,500.00              | 13,125.00              | 14,437.50                     | 91,341,250.00     | 481,731,250.00 | 573,072,500.00    |                                                   |
| CPE Sub Total                               |                                        |      |                 |                       |                        |                               |                   |                |                   |                                                   |
| <b>9. Housing Cost</b>                      |                                        |      |                 |                       |                        |                               | Phase I           | Phase II       | RCP Total         |                                                   |
|                                             |                                        |      |                 |                       |                        |                               | 82,500,000.00     | 412,500,000.00 | 495,000,000.00    | 15,000 in P-II                                    |
| 1                                           | Remote Station Housing                 | -    | 3000            | -                     | 25,000.00              | 27,500.00                     | 82,500,000.00     | 412,500,000.00 | 495,000,000.00    |                                                   |





## Rural Connectivity Project Communication Plan

| Deliverable/Description       | Type (Man/Info) | Target Audience(s)                  | Delivery Method                         | Delivery Frequency | Who Responsible?     |
|-------------------------------|-----------------|-------------------------------------|-----------------------------------------|--------------------|----------------------|
| Status Reports                | Mandatory       | Steering committee<br>TESD          | Project Status Report template provided | Weekly             | Program manager      |
| Activity Reports              | Mandatory       | Project Managers<br>Program Manager | Template provided                       | Weekly             | Project Coordinators |
| Project Status Report Summary | Mandatory       | Steering Committee<br>TESD          | Template Provided                       | Monthly            | Program Manager      |
|                               |                 |                                     |                                         |                    |                      |

**Ethiopian Telecommunication Corporation  
Rural Connectivity Project  
Addis Ababa**

Tel: 251-1- Fax 251-1- P. O. Box: 1047 Email:evillage@telecom.net.et

**Team Supervisors Progress Report Form**

Report Date \_\_\_\_\_

Description of work:

Following are detail activities in which this team is responsible

- Inventory
- Power activities
- Labeling of all Equipment
- Testing
- Installation
- Preparation of Rooms
- Supervision and controlling
- Documentation of all labels and necessary items.
- foundation work
- Earthling

Installation Team Leader \_\_\_\_\_

Sig. \_\_\_\_\_

Project code \_\_\_\_\_ Project Type \_\_\_\_\_ Connected to \_\_\_\_\_

Name \_\_\_\_\_ Region \_\_\_\_\_

Planned Starting Date of Installation \_\_\_\_\_

Planned Completion Date of Installation \_\_\_\_\_

Start Report on the Installation Activity Performed \_\_\_\_\_

\_\_\_\_\_

Outstanding Problems Observed \_\_\_\_\_

\_\_\_\_\_

Additional page can be attached if required

CP project finished on time?

No

If No, Specify the reason \_\_\_\_\_

\_\_\_\_\_

Please attach inventory of all equipment delivered to the site.

Name of Participants

\_\_\_\_\_ Sig. \_\_\_\_\_

\_\_\_\_\_ Sig. \_\_\_\_\_

\_\_\_\_\_ Sig. \_\_\_\_\_

Received By \_\_\_\_\_ Date \_\_\_\_\_ Sig. \_\_\_\_\_

(Regional / Zonal Project Coordinator)

**N.B This form shall be used for one Project site only.**

Annex

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**Addis Ababa**

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**Program Manager Activity Progress Report Form**

To: Steering Committee

| Site Name | Project Code | Activity performed | Remark |
|-----------|--------------|--------------------|--------|
|           |              |                    |        |

Prepared by \_\_\_\_\_  
(Program Manager)

Date. \_\_\_\_\_ Sig. \_\_\_\_\_

Annex 3

**Ethiopian Telecommunication Corporation**  
**Rural Connectivity Project**  
**Addis Ababa**

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**Progress Report Form**

Month \_\_\_\_\_

To: Program Manager

| Training Site Name | Description | No Trainees | Trainee Weeks | Remark |
|--------------------|-------------|-------------|---------------|--------|
|                    |             |             |               |        |

Prepared by \_\_\_\_\_ Date \_\_\_\_\_ Sig \_\_\_\_\_  
(Planning & Development / Regional / Zonal Training Coordinators)

Annex

**Ethiopian Telecommunication Corporation**  
**Rural Connectivity Project**  
**Addis Ababa**

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**Progress Report Form**

**To: Program Manager**

| Site Name | Project Code | Activity performed | Remark |
|-----------|--------------|--------------------|--------|
|           |              |                    |        |

Prepared by \_\_\_\_\_ Date \_\_\_\_\_ Sig \_\_\_\_\_  
(Project Managers/Expert & Technical Support / Program Support / Regional / Zonal Project Coordinators)

**E-Village Project** ✓  
**Project Status Report**  
**Period Ending MM/DD/YY**

Project Manager:

Project Description:

| Yes | No | Overall Status — At a Glance                                                 |
|-----|----|------------------------------------------------------------------------------|
|     |    | Will the project be completed on time?                                       |
|     |    | Will the project complete within budget?                                     |
|     |    | Will the project deliverables be completed within acceptable quality levels? |
|     |    | Are scope change requests being managed successfully?                        |
|     |    | Are project issues being addressed successfully?                             |
|     |    | Are project risks being successfully mitigated?                              |
|     |    | Are all customer concerns being addressed successfully?                      |

Explanation of Items Above Checked "No":

Significant Accomplishments This Period:

Planned Accomplishments Next Period:

Additional Comments or Highlights Not Reflected Above:

