Effectiveness of monitoring and controlling for agricultural projects

By

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Effectiveness of monitoring and controlling for agricultural projects

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Declaration of Candidate

I hereby declare that this research project work is my own work and that it has not been submitted anywhere for any approval.

Name: Muhidin Jemal Ahmed

Signature: _____

Date: June 09, 2017

List of Abbreviations

BCM	Beneficiary Contact Monitoring
EARO	Ethiopian Agricultural Research Organization
EIAR	Ethiopian Institute of Agricultural Research
IAR	Institute of Agricultural Research
M&E	Monitoring and Evaluation
MIS	Management Information System
MoA	Ministry of Agriculture
PMI	Project Management Institute
PMIS	Project Management Information System
R&D	Research and Development
SPSS	Statistical Package for Social Science
WBS	Work Breakdown Structure

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Abstract

The study was conducted in Ministry of Agriculture (MoA) and Ethiopian Institute of Agricultural Research (EIAR) to investigate the ***effectiveness of monitoring and control for agricultural projects.*** *Like any projects, agricultural projects have faced challenges of completing the projects within project constraints. This is the result of not having the capability to accurately monitor and control project constraints. The objectives of this research were to determine project monitoring techniques, measurer project performance effectiveness, determine the effective uses of monitoring information for decision making and the effects of organization for effectiveness of monitoring and control of agricultural projects. Self administered questionnaires were prepared and answered by 33 and 18 respondents from MoA and EIAR respectively. 5-point Likert rating scale and Mann-Whitney model were used for the data analysis. According to the results both MoA and EIAR are used different kinds of project monitoring techniques such as questionnaire, interview, observation, case study, focus group discussion and document review. The result of the analysis revealed that the mean for overall effectiveness of agricultural projects is 3.6780. The result of the analysis discovered that agricultural project planning, implementation, information management, control, efficiency and effectiveness are greater than 3.5 except agricultural project monitoring is 3.3109. Respondents in both organizations have positive opinion for the effectiveness of agricultural projects in their organizations. The Mann-Whitney U test showed that there is a significance difference of the effectiveness of agricultural projects between MoA and EIAR at 5% error level ($U = 125.000$; $p = 0.0001$, therefore $p < 0.05$). EIAR (35.56) has a higher mean ranks than MoA (20.78), that mean the project effectiveness in EIAR is significantly higher than the project effectiveness in the MoA thus rejecting the null hypothesis and supporting the alternative hypothesis. Similarly, project implementation, information communication, project control and project effectiveness are significantly higher in EIAR than the MoA at 5% of error level.*

Key words: Agriculture, Control, Effectiveness, Efficiency & Implementation

CHAPTER ONE

Introduction

1.1. Background

Monitoring and control a project is the process or activities whereby the project manager tracks, reviews and revises the project activities in order to ensure the project creates the deliverables in accordance with the project objectives. Because of the unique and temporary nature of projects, they require active control. Unlike a process where the same set of activities have been performed repeatedly so that habits and expectations are stable, a project is inherently unstable. The activities are unique to the project or the sequence of activities and resources are only temporarily assigned and associated with the project and are redeployed when the project completes. Habits and patterns are not established before everything changes. Project monitoring and control systems involves working out a plan of campaign or budget/schedule plan for a project and ensuring that it is completed within the predetermined plan with all things being equal while maintaining good quality product (Al-Jibouri, 2003, P.147).

Project Monitoring is the set of procedures and management practices used to collect information about the performance achieved or forecasted in a project and the developing organization, based on a set of performance metrics. Monitoring is collecting, recording, and reporting information concerning any and all aspects of project performance that the project manager or others in the organization wish to know. Project monitoring is a process of keeping track and to check systematically all the project activities.

Some project managers still continue to unrealized their expected performance at the end of the project completion, due to the fact that many project managers' project control systems are not continuous. Many authors are of the view that project control from project manager's perceptive to be effective, the systems should be continuous from the conception stage up to completion stage of the project; this will ensure that the various

operations involved are executed and monitored to prevent unnecessary cost overrun and delay of the project schedule due to irrelevant factors.

Project control is the process of comparing actual performance against plan to identify deviations, evaluate possible alternative courses of actions, and take appropriate corrective action. The project control follows baseline plan, measuring progress and performance, comparing plan against actual to determine the status of the project cost, schedule, and technical performance objectives and taking corrective actions for any variance (Erik & Clifford, 2011, P.454). The purpose of project control is to adjust the project to meet its goals by assessing the performance of the project, analyzing the causes of performance problems, designing changes to address problems that are determined to need attentions, and implementing those changes through control actions.

Reporting performance, comparing the differences between desired and actual performance levels, and accounting for why such differences exist are all parts of the control process. In essence, control is the act of reducing the difference between plan and reality. Using the information gained from monitoring the project, as well as information concerning changes in the organizational goals, resources, and strategy, this group may need to take some form of action (control) regarding the project, such as redirecting it, getting it back on track, or perhaps even terminating it.

1.2. Statement of the problem

Project management provides people with a powerful set of tools that improves their ability to plan, implement, and manage activities to accomplish specific organizational objectives. Project management has spread to all avenues of work. Today, project teams carry out everything from port expansions to hospital restructuring to upgrading information systems. They are creating next generation, fuel efficient vehicles, developing sustainable sources of energy, and exploring the farthest reaches of outer space. All of mankind's greatest accomplishments from building the great pyramids to discovering a cure for polio to putting a man on the moon began as a project.

Project management is a vehicle for doing good deeds and solving social problems. Endeavors such as providing emergency aid, devising a strategy for reducing crime and drug abuse within a city, big development projects in different sectors (agriculture, irrigation, road and dam construction), organizing a community effort to renovate a public playground would and do benefit from the application of modern project management skills and techniques. However, Project management is not without problems. The Standish Group has tracked that the failure rates of projects are documented to range from 70 percent and higher (Robert K., 2009, P.514).

Agricultural projects face environmental uncertainties (climate changes) which drastically affect the effectiveness of agricultural projects. Failure or Proper implementation of agricultural projects is hampered by inadequate requirement definition, unmanageable project scope and lack of revision after significant changes in resources or time. Inadequate planning during the initiation phase leads to plans which cannot be managed effectively during execution. However, even when the planning process is successful, and what is assumed to be a well derived plan is established, project management can still be ineffective. This is typically the result of not having the capability to accurately monitor and control schedule and/or cost. Therefore, this research paper addresses the effectiveness of monitoring and control for agricultural projects

1.3. Research questions

The specific research questions were:

1. What kinds of project monitoring techniques are conducted in agricultural projects?
2. How did project performance measure?
3. How did monitoring information used for decision making (project control)?
4. Did organization affect effectiveness of agricultural projects?

1.4. Research objectives

The main aim of the research was to examine the effectiveness of monitoring and control of agricultural projects. The specific objectives of this research were:

1. To determine project monitoring techniques
2. To measurer project performance
3. To determine the effective uses of monitoring information for decision making
4. To compare organizational effectiveness of agricultural projects

1.5. Significance

Therefore, this research project helps agricultural projects to improve the effectiveness of project monitoring and control systems and other organizations also use the research finding to effectively monitoring and control agricultural projects. Project team members who are participating in project planning can be used the findings of the research as an input for future project development. The research findings contribute for agricultural monitoring and control knowledge due to the finding can be used as a reference for further study.

1.6. Scope of the Study

The scope of the study is limited only to MoA (ministry of Agriculture) and EIAR (Ethiopian Institute of Agricultural Research) due to time and financial constraints. Both MoA and EIAR are implementing government and foreign funded agricultural projects. But this research concentrates only foreign funded agricultural projects in the MoA and EIAR.

1.7. Limitation of the Study

The research would have aimed to gather effectiveness of monitoring and control for agricultural data from more than three organizations but due to schedule constraints the data were collected from two organizations only. Due to schedule constraints the study was mainly concentrated attitudinal type of questionnaires that may be brought result biasedness.

1.8. Organization of the Research

This study has five chapters containing introductory part with background of the study, statement of the problem, research objectives and questions, significance, scope and limitations of the study are included in chapter one. Review of the relevant literature about project monitoring and control was explained in chapter two. Details of the research methodology such as research location, design, data sampling techniques, data collection and method of data analysis were explained in chapter three. Chapter four contains the detail parts of the analysis. Summary, conclusion and recommendations were discussed in chapter five. Bibliography was listed at the end of chapter five. Questionnaires used for the research were included in the Appendix part.

Review of Related Literature

2.1. Monitor and Control Projects

Monitoring and control project is the process of tracking, reviewing, and reporting the progress to meet the performance objectives defined in the project management plan. The key benefit of this process is that it allows stakeholders to understand the current state of the project, the steps taken, and budget, schedule, and scope forecasts (PMI, 2013, P.85).

Monitoring is an aspect of project management performed throughout the project. Monitoring includes collecting, measuring, and distributing performance information, and assessing measurements and trends to effect process improvements. Continuous monitoring gives the project management team insight into the health of the project and identifies any areas that may require special attention. Control includes determining corrective or preventive actions or replanning and following up on action plans to determine whether the actions taken resolved the performance issue.

In order to prevent project cost overruns, the financials for the project have to be vigilantly monitored and controlled. Once the initial funding is granted to the project and expenses are being paid, the monitoring and controlling financial process begins. Metrics are used to determine if the financials are tracking according to plan. If there are any discrepancies, they are investigated to determine how the project can get back on track (Paula & Bruce, 2010, P.106).

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Throughout the project, the schedule needs to be monitored and controlled to keep it in alignment with planned benefits. This process ensures that components produce deliverables on time. The start and finish time is tracked and compared to planned time estimates. As variances are identified, corrective action is taken. The schedule is analyzed to identify opportunities for acceleration or active compression (Paula & Bruce, 2010, P.101).

The monitor and control project work process is concerned with:

1. Comparing actual project performance against the project management plan;
2. Assessing performance to determine whether any corrective or preventive actions are indicated, and then recommending those actions as necessary;
3. Identifying new risks and analyzing, tracking, and monitoring existing project risks to make sure the risks are identified, their status is reported, and that appropriate risk response plans are being executed;
4. Maintaining an accurate, timely information base concerning the project's product(s) and their associated documentation through project completion;
5. Providing information to support status reporting, progress measurement, and forecasting;
6. Providing forecasts to update current cost and current schedule information;
7. Monitoring implementation of approved changes as they occur; and
8. Providing appropriate reporting on project progress and status to program management when the project is part of an overall program.

2.1.1. Monitor and control project performance

The monitor and control project performance process examines the current conditions to make sure that the project follows the approved plan. Monitoring and controlling happens throughout the project life cycle. Information is collected, analyzed, and distributed to provide trend information to the appropriate stakeholders. Depending on the results of the analysis, corrective action may be taken, which will put the component work in alignment with the benefits delivery of the project (Paula & Bruce, 2010, P.97).

2.1.2. Monitor and control project scope

The project scope is monitored and controlled to ensure that the planned objectives for the project are realized. Projects are large and complex, and have an extended duration. As the project progresses, it is critical to monitor and control scope. Changes to the scope have an enormous impact on the project and the components within it. To change the scope of a project,

it will have to go through a formal change control process and receive approval from the governance board (Paula & Bruce, 2010, P.100).

2.1.3. Monitor and control project schedule

Throughout the project, the schedule needs to be monitored and controlled to keep it in alignment with planned benefits. This process ensures that components produce deliverables on time. The start and finish time is tracked and compared to planned time estimates. As variances are identified, corrective action is taken. The schedule is analyzed to identify opportunities for acceleration or active compression (Paula & Bruce, 2010, P.101).

2.1.4. Monitor and control project risks

Risks are identified and tracked throughout the project life cycle. Risk triggers are identified. Risks are monitored and controlled, analyzed, and reanalyzed. The probability and impact of the risks are updated as new information presents itself. Risks may change their ratings due to circumstances that may no longer be valid, or due to a greater impact (Paula & Bruce, 2010, P.104).

2.1.5. Monitor and control project financials

In order to prevent project cost overruns, the financials for the project have to be vigilantly monitored and controlled. Once the initial funding is granted to the project and expenses are being paid, the monitoring and controlling financial process begins. Metrics are used to determine if the financials are tracking according to plan. If there are any discrepancies, they are investigated to determine how the project can get back on track (Paula & Bruce, 2010, P.106).

2.2. Project monitoring

2.2.1. Definition of Project Monitoring

Project management has the task of establishing sufficient controls over a project to ensure that it stays on track towards the achievement of its objectives. This is done by monitoring (internal), which is the systematic and continuous collection, analysis and use of information for management control and decision-making. In this instance implementation is seen as a continuous learning process where experience gathered is analysed and fed back into planning and updated implementation approaches. Project monitoring is an integral part of day-to-day management. It provides information by which management can identify and solve implementation problems, and assess progress. The logical framework, the implementation schedule, activity schedules, and project budget provide the basis for this monitoring.

Project monitoring provides managers and other stakeholders with regular information on progress relative to the whole causal sequence from inputs to outcomes. It is descriptive and by comparing actual progress with target progress, monitoring can alert management of favorable or negative variances. This flow of relevant information during implementation enables managers to keep track of progress, to adjust operations to take account of experience and to formulate budgetary requests and justify any needed increase in expenditure. Indeed, an effective management information system (MIS) that performs these functions is an essential part of good management practice.

Project monitoring is a continuous process of collecting, analyzing, documenting, and reporting information on progress to achieve set project objectives. This information assists timely decision-making, ensures accountability, and provides the basis for evaluation and learning. Monitoring provides early indications of progress and achievement of objectives. Monitoring is a continuous process that tracks what is happening within a program and uses the data collected to inform program implementation and day-to-day management and decisions. Using mostly administrative data, monitoring tracks program performance against expected results, makes comparisons across programs, and analyzes trends over time. Usually, monitoring tracks inputs,

activities, and outputs, though occasionally it can include outcomes, such as progress toward national development goals (Paul et al., P.25)

Monitoring is the art of collecting necessary information with minimum effort in order to make a steering decision at the right time. This information is then used as data for analysis, discussion, evaluation and reporting. The aim is to see if programs are doing the right thing (effectiveness) and doing it right (efficiency). It provides project management and stakeholders with information of early indicators about project progress. Monitoring is generally performed while projects are under implementation (Patrick, 2011, P.1). Monitoring is the routine collection and analysis of information to track progress against set plans and check compliance to established standards. It helps identify trends and patterns, adapt strategies and inform decisions for project/programme management). Figure 1 summarizes key monitoring questions as they relate to the logframe's objectives. Monitoring focus more on the lower-level objectives – inputs, activities and (to a certain extent) outcomes (IFRC, 2011, P.11).

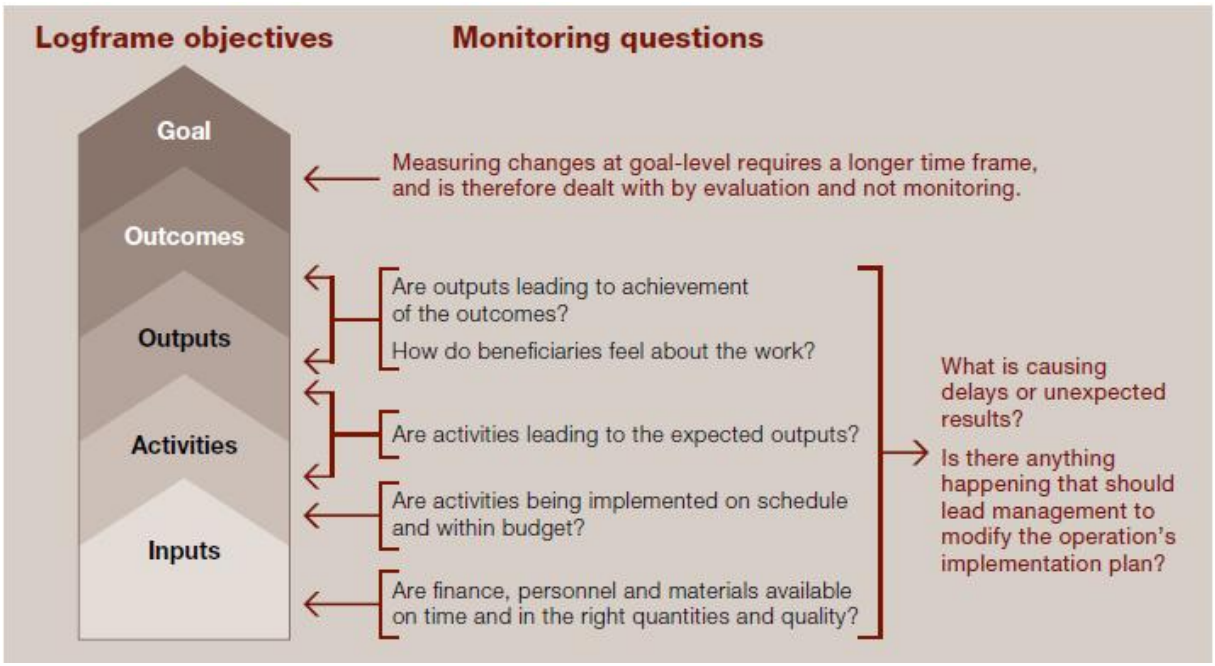

Figure 1. Monitoring questions and the logframe (IFRC, 2011, P.11)

Monitoring is the process of routinely collecting, storing, analyzing and reporting project information used to make decisions for project management. Monitoring provides project

management and project stakeholders the information needed to evaluate the progress of the project, identify trends, patterns or deviations, keep project schedule and measure progress towards the expected goals. Monitoring information allows decisions regarding the use of project resources (human, material and financial) to enhance its effectiveness. When the right information is available at the right time and to the right people it can support decisions, like changes in the implementation strategies, that can help the project reduce costs and increase its outputs.

Project monitoring is the continuous assessment of project implementation in relation to the agreed plans and the agreed provision of services to project beneficiaries. As such project monitoring provides invaluable information to managers and other project stakeholders on the progress of the project. Opportunely identifies potential successes or problems to facilitate timely adjustments to project operations.

Monitoring is setting targets and milestones to measure progress and achievement, and whether the inputs are producing the planned outputs. In other words, monitoring sees whether the project is consistent with the design. The monitoring phase of project evaluation allows us to track progress and identify issues early during implementation, thus providing and opportunity to take corrective action or make proactive improvements as required. Monitoring is ongoing and tends to focus on what is happening. Monitoring data is typically used by managers for ongoing project/programme implementation, tracking outputs, budgets, compliance with procedures.

2.2.2. Importance of project Monitoring

Monitoring and evaluation of projects can be a powerful means to measure project performance, track progress towards achieving desired goals, and learn and apply lessons. The M&E system and the logical framework underpinning it can also be key to communicating the project strategy to all project implementing partners and stakeholders in a clear way. The project monitoring and control processes are used by project managers and project teams to ensure the team is making satisfactory progress to the project goals. The purpose is to track all major project variables-cost, time, scope, and quality of deliverables. M&E provides a flow of information for internal uses by

managers, and for external use by stakeholders who expect to see results, want to see demonstrable impacts, and require accountability and trustworthiness on the part of the public. The early emergence of recorded benefits can then help reinforce ownership, whilst early warning of emerging problems can allow all stakeholders to contribute to corrective action before costs rise.

2.2.3. Common Types of Monitoring

- Results monitoring track effects and impacts. This is where monitoring merges with evaluation to determine if the project is on target towards its intended results (outputs, outcomes, impact) and whether there may be any unintended impact (positive or negative). For example, a psychosocial project may monitor that its community activities achieve the outputs that contribute to community resilience and ability to recover from a disaster (IFRC, 2011, P.12).

- Process (activity) monitoring tracks the use of inputs and resources, the progress of activities and the delivery of outputs. It examines how activities are delivered – the efficiency in time and resources. It is often conducted in conjunction with compliance monitoring and feeds into the evaluation of impact (IFRC, 2011, P.12).

- Compliance monitoring ensures compliance with donor regulations and expected results, grant and contract requirements, local governmental regulations and laws, and ethical standards (IFRC, 2011, P.12).

- Context (situation) monitoring tracks the setting in which the project operates, especially as it affects identified risks and assumptions, but also any unexpected considerations that may arise. It includes the field as well as the larger political, institutional, funding, and policy context that affect the project. For example, a project in a conflict-prone area may monitor potential fighting that could not only affect project success but endanger project staff and volunteers (IFRC, 2011, P.12).

- Beneficiary monitoring tracks beneficiary perceptions of a project. It includes beneficiary satisfaction or complaints with the project, including their participation, treatment, access to resources and their overall experience of change. Sometimes referred to as beneficiary contact monitoring (BCM), it often includes a stakeholder complaints and feedback mechanism. It should take account of different population groups, as well as the perceptions of indirect beneficiaries (IFRC, 2011, P.12).

- Financial monitoring accounts for costs by input and activity within predefined categories of expenditure. It is often conducted in conjunction with compliance and process monitoring. For example, a livelihoods project implementing a series of micro-enterprises may monitor the money awarded and repaid, and ensure implementation is according to the budget and time frame (IFRC, 2011, P.12).

- Organizational monitoring tracks the sustainability, institutional development and capacity building in the project and with its partners. It is often done in conjunction with the monitoring processes of the larger, implementing organization (IFRC, 2011, P.12).

2.2.4. Project monitoring tools

What tools should the project manager use to collect monitoring data for the project? It all depends. Unfortunately there is no magical rule or formula to follow, however once we know what data we need to collect to answer our evaluation questions, some logical choices present themselves. When should the project manager select the monitoring tools for the project? Selecting the tools for the project should come naturally when creating monitoring and evaluation (M&E) plan. When the project manager creates M&E plan the project manager will be forced to think ‘what tool or method will use to collect the data to answer the monitoring question’. Some of the recommended tools to monitor and evaluate some common tasks are summarized in the table below (CSE, 2017).

Table 1. Project monitoring tools

Common project tasks & activities	Suggested tools
Workshop, conference, intervention or public event	• Dart board • Observation • Questionnaire
Measuring changes in resource use	• Deemed Savings • Footprint Calculators • Metering • Meter Reading
Effectiveness of communications materials	1. Focus Group 2. Observation 3. Questionnaire
Measuring project efficiency	1. Budget Tracking 2. Time Tracking
Documenting lessons learned post-project	1. Focus group 2. Lessons Learnt workshop 3. Project Diary 4. Program Logic review 5. Stakeholder meeting
Communicate outcomes	• Focus group • Storytelling

2.2.5. Project Efficiency and Effectiveness

Efficiency and effectiveness were originally industrial engineering concepts that came of age in the early twentieth century. Management theorists like Frederick Taylor and Frank and Lillian Gilbreth designed time and motion studies primarily to improve efficiency. The concept of effectiveness, which takes into consideration creating value and pleasing the customer, became popular in the United States in the early 1980s when Americans perceived Japanese products such as cars and electronics to offer greater value and quality (Marilyn & Helms, 2006, P.217).

In the context of process reengineering, Roberts (1994) defines efficiency as the degree of economy with which the process consumes resources especially time and money. Process

management defines efficiency is doing things right (Marilyn & Helms, 2006, P.217). Efficiency relates inputs to outputs. Increased efficiency comes from achieving greater outputs using the same or fewer resources (Kate, 2006, P.210). Stephen and Timothy (2013) dfined efficiency refers to the degree to which an organization can achieve its ends at a low cost. Efficiency is a measure of how economically resources/ inputs (funds, expertise, time, etc.) are converted to results (Jody & Ray, 2004, P.225). Efficiency is getting work done with a minimum of effort, expense, or waste (Chuck, 2011, P.7).

Process reengineering Roberts (1994) defines effectiveness as how well the process actually accomplishes its intended purpose, here again from the customer's point of view whereas process management defines effectiveness is doing the right things (Marilyn & Helms, 2006, P.217). Effectiveness describes the extent to which outputs achieve the objectives set for them. That means the extent to which outputs satisfy the needs and wants of the next customer in the supply chain. The closer outputs come to meeting their needs, the more customers will value them. However, improving effectiveness does not necessarily mean providing a better product or service. The emphasis here is on achieving a match between outputs and customer needs (Kate, 2006, P.211). Stephen and Timothy (2013) dfined effectiveness refers to the degree to which an organization meets the needs of its clientele or customers. Effectiveness is the extent to which the development intervention's objectives were achieved, or are expected to be achieved, taking into account their relative importance. It is an aggregate measure of (judgment about) the merit or worth of an activity, i.e., the extent to which an intervention has attained, or is expected to attain, its major relevant objectives efficiently in a sustainable fashion and with a positive institutional development impact (Jody & Ray, 2004, P.225). Efficiency alone, however, is not enough to ensure success. Managers must also strive for effectiveness, which is accomplishing tasks that help fulfill organizational objectives such as customer service and satisfaction (Chuck, 2011, P.8).

2.3. Project Management Information System

Information management is a process, not an event, and will only succeed if those involved understand the value of information and is committed to its effective use. Managing information

is a means to an end, not an end in itself, and the real measure of success is how improved management increases the timeliness, appropriateness, and coordination of humanitarian assistance (Rodolfo, 2004, P.106).

Information Management describes the means by which a project efficiently manages its information resources, and through which it ensures that the value of that information is identified and exploited to the fullest extent. Information management is the channeling of the information resources and information capabilities of the project in order to add and create value both for itself and for its stakeholders. Information management is the management of processes and systems that identify, acquire, create, organize, store, distribute, and use information.

A project management information system (PMIS) is a set of procedures, equipment, and other resources for collecting, analyzing, storing, and reporting information that describes project performance. A project needs to adopt a process view of information management, in this view; information management is a continuous cycle of eight closely related activities: identification of information needs, locating the information sources, acquisition and creation of information, organization and storage of information, analyzing and reporting information, information dissemination, information use, evaluating the information process.

The concept underlying Information Management is that just as a project purposefully and systematically manages its human resources and financial assets, it should do likewise for its information resources and processes. All the classic functions of managing an organizational activity apply to IM as well: defining goals, providing leadership, developing policies, allocating resources, training staff, evaluation and feedback.

Information Management means the management of an eight step process of; defining, locating, selecting, collecting, analyzing, reporting, using, and evaluating information (Figure 1). This process is also known as the Information Life Cycle. A cycle that constantly feeds back to itself to improve the process on every cycle (Rodolfo, 2004, P.107).

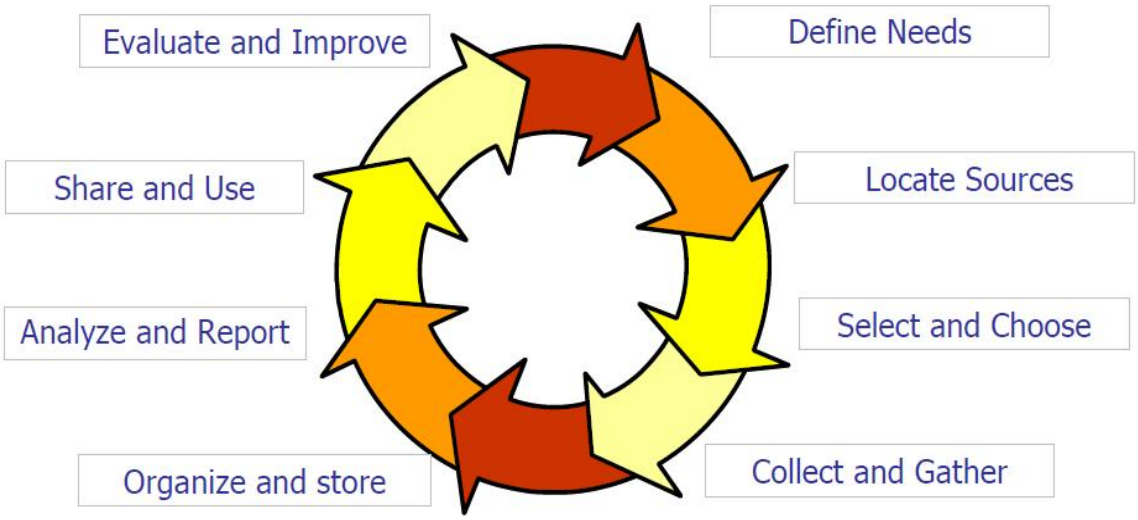

Figure 2. The Information Process Life Cycle

2.4. Project control

It is impossible at the onset of a project to foresee all problems or to anticipate all changes that the project might need. Still, ever effort is made throughout the project to regulate work minimize changes to the plan, and guide the project toward pre established performance, cost, and schedule objectives. The process of keeping the project moving toward objectives and as close to plan as possible is the subject of project control.

Information is collected about project performance, compared with the desired (or planned) level, and action taken if actual and desired performance differ enough that the controller (manager) wishes to decrease the difference. Reporting performance, comparing the differences between desired and actual performance levels, and accounting for why such differences exist are all parts of the control process. In essence, control is the act of reducing the difference between plan and reality (Jack & Samuel, 2009, P.475).

Project control is the process of comparing project actual performance against plan to identify deviations, evaluate possible alternative courses of actions, and take appropriate corrective action. The project control steps for measuring and evaluating project performance are setting a

baseline plan, measuring progress and performance, comparing plan against actual and taking corrective action (Erik & Clifford, 2011, P.454).

The baseline plan provides us with the elements for measuring performance. The baseline is derived from the cost and duration information found in the work breakdown structure (WBS) database and time-sequence data from the network and resource scheduling decisions. From the WBS the project resource schedule is used to time-phase all work, resources, and budgets into a baseline plan.

Because plans seldom materialize as expected, it becomes imperative to measure deviations from plan to determine if action is necessary. Periodic monitoring and measuring the status of the project allow for comparisons of actual versus expected plans. It is crucial that the timing of status reports be frequent enough to allow for early detection of variations from plan and early correction of causes. Usually status reports should take place every one to four weeks to be useful and allow for proactive correction. If deviations from plans are significant, corrective action will be needed to bring the project back in line with the original or revised plan. In some cases, conditions or scope can change, which, in turn, will require a change in the baseline plan to recognize new information.

2.5. Conceptual Framework

So far, review of the related literature has shown that, there are different factors which determine effectiveness and efficiency of monitoring and control of agricultural projects. These include agricultural project planning, implementation, monitoring and control, project information management and decision making.

Agricultural project planning influences effectiveness and efficiency of project monitoring and control. A complete plan will clearly state the tasks that need to be done, why they are necessary, who will do what, when it will be completed, what resources will be needed, and what criteria must be met in order for the project to be declared complete and successful. Proper planning reduces uncertainty by considering the likely outcomes and to put the necessary corrective

measures, gives us a better understanding of the goals and objectives of the project and improves efficiency through scheduling the work to take advantage of resource availability (Robert & Rudd, 2003, P.20). The planning (budgeting and scheduling) methods it proposed is "put the hassles up front." Planning requires a significantly greater investment of time and energy early in the life of the project, but it significantly reduce the extent and cost of poor performance and time/cost overruns (Jack & Samuel, 2009, P.438).

The purpose of implementation is to provide the means, facilities, materials, and personnel for producing the end product. The goal of implementation is to produce the completed deliverable(s) in accordance with the results of the project planning. During implementation, it will continually review the deliverable(s) and its schedule and cost to ensure that it remain acceptable to the customer and the funding sources. Any changes offered during implementation usually cause project delays and cost overruns. The on time completion of a project according to specifications and within allotted funds enhances the reputation of the manager, the project team members, and the organization (Robert, Norman, & Thomas, 2003, P.123).

The only reason for doing a project plan (including the schedule) is to achieve control of the project. If the project manager has no plan, he can't possibly have control. If he is going to control a project, he needs to know where he is supposed to be, and where he is. The plan tells the project manager where he is supposed to be. As for where he actually is, that comes from the project monitoring. Project control ensures that project objectives are met by monitoring and measuring progress regularly to identify plan variances so that corrective actions may be taken. Project progress monitoring provides the actual status of the project activities, the deviation and the causes if any and corrective actions to bring the project back to the right track according to the project plan (James, 2005, P.340).

Effectiveness of project management depends greatly on carefully designed project management information systems (PMIS). PMIS allow effective planning, updating, and change control of project parameters. Successful project control depends greatly on carefully designed and properly implemented PMIS and meaningful communications. Good information management gives project management the greatest chance of success. A PMIS is essential to monitor project

status, evaluate progress, and control the use of resources on the project. PMIS planning involves determining the information requirements of project stakeholders: who needs what information, when will they need it, how will it be provided to them, and by whom. The main function of a PMIS is to transform project data to relevant information that enhance decision-making, resulting in improved project performance (David, 2004, P.449).

Well prepared project planning, coordination of people and other resources to carry out the project plan, monitoring information regarding the use of project resources (human, material and financial), comparing progress against plan in order to take corrective action when a deviation occurs and sharing the right information at the right time and to the right people for decision making like changes in the implementation strategies can help to reduce project costs and duration and increases its deliverables. Hence project planning, implementation, monitoring and control and information management increases the effectiveness and efficiency of the project(s) which leads to the achievement of project objectives?

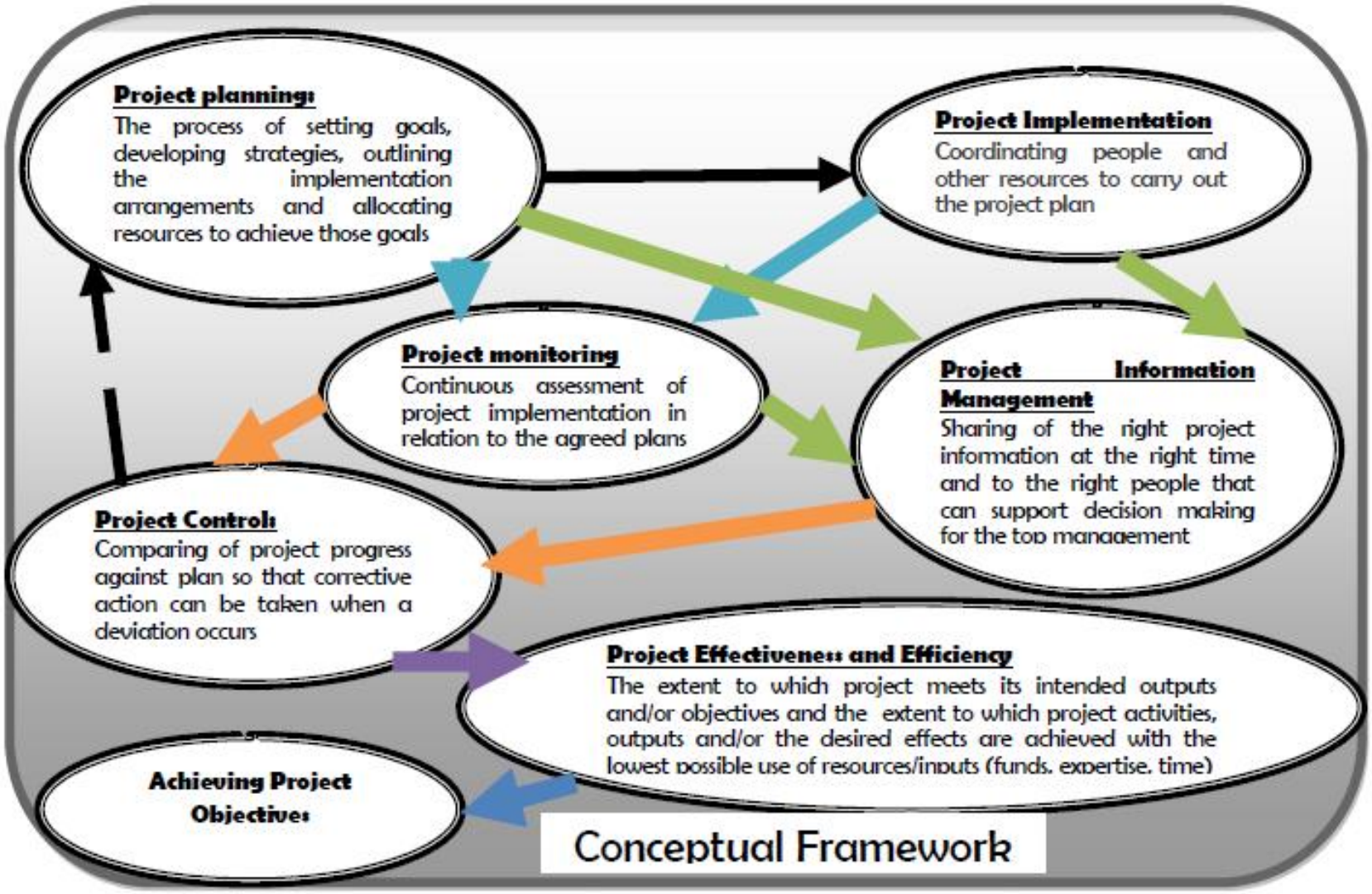

Figure 3. Conceptual Framework

CHAPTER THREE

Research Methodology

3.1. Description of the study area

This research was done in Addis Ababa in the Ministry of Agriculture (MoA) and Ethiopian Institute of Agricultural Research (EIAR). Both of the organizations are located in Gurd Shola areas back of Ministry of Energy. MoA is a ministry of the Federal Democratic Republic of Ethiopia which was established in 1907 to oversee the agricultural and rural development policies of the country. EIAR, known as the Ethiopian Agricultural Research Organization (EARO) until 2005, was formed in 1997 through a merger of the Institute of Agricultural Research (IAR) with several other research centers.

3.2. Research design

Research design is the general plan of how is going about answering the research question(s). The research design contains clear objectives, derived from the research question(s), specify the sources from which it intends to collect data, and consider the constraints that are inevitably have as well as discussing ethical issues.

Descriptive research was employed by using attitude and opinion questionnaires. The purpose of this research was to examine whether and how the monitoring of project(s) influences the controlling of project activities and effectiveness of monitoring and control of agricultural projects to achieve project objectives.

The survey strategy was used to collect data. Questionnaires were designed, pre-tested the questionnaires and amended, standardized and administered. Using the survey strategy, quantitative data were collected and analyzed quantitatively using descriptive and inferential statistics. Quantitative is data collection technique (such as a questionnaire) or data analysis procedure (such as graphs or statistics) that generates or uses numerical data.

3.3. Population and sample size

Both propability and non-probability sampling techniques were employed for collecting the data. Purposive non-probability sampling technique was used to select the organization (MoA and EIAR) due to both of them are handling a number of large agricultural projects. Both of the organizations are implementing both government funded and foreign funded large agricultural projects. Foreign funded agricultural projects were purposively taken in both organization due to that foreign funded projects has tight monitoring and control system to gain reputation from funding organization and the funding organization also a tight control system to achieve the objectives of the projects. Then, simple random probability sampling technique was used for the selection of individual respondents in both MoA and EIAR. The total pouplation that are working in the MoA and EIAR as a foreign funded projects at head office level are 41 and 26 respectively. The population that are working in foreign funded projects in both organizations have close relashinships with project planning, implementation, monitoring, information management and project control. The population are homogenous in terms of the knowhow of foreign funded project planning, implementation, monitoring, information management and project control. The sample size that was taken for the study from MoA and EIAR is 33 and 18 respectively.

3.4. Data and data sources

The research was used quantitative and qualitative data. The data source for this study included both primary and secondary sources. Primary data were collected using self administered questionnaires or the questionnaires were completed by the respondents. The questionnaires were delivered by hand to each respondent and collected latter after the respondent completed the questionnaires. Most of the questionnaires were attitudinal or opinion variables that records how the respondents feel about effectiveness of agricultural projects or what respondents think or believe for the effectiveness of agricultural projects. Five point Likert-style rating scale questionnaires were used. The respondent was asked how strongly she or he agrees or disagrees with a statement(s) for the effectiveness of agricultural projects. Before rushing into actual survey pretest was conducted in order to check the validity of the questionnaires. After the

pretest the questionnaire was improved accordingly. Secondary data were collected from literatures.

3.5. Ethical considerations

The ethical considerations need to be considered in a scientific research were also considered in this research. It was formulated the research topic and research design, got access to data collection in the field, collected data, processed and stored the data and wrote up the research findings in a moral and responsible way.

3.6. Method of Data analysis

Coding was given to all closed ended (structured) interview to rearrange the responses of each question in a manageable way. After coding of the self administered questionnaires, **data entry** was taken. The data obtained from the self administered questionnaires to assess the effectiveness of monitoring the project was analyzed using Statistical Package for Social Science (SPSS).

In order to meet the objectives of the study, reliability analysis using Cronbach's Alpha was applied (Appendix 2). Reliability is the ability of the questionnaire to consistently measure the topic under study at different times and across different populations. In other words, reliability of the questionnaire implies that measurement of the indicators gives the same meaning every time the measurement is repeated (Perry et al., 2004, P.356). Questionnaire(s) that affected the reliability of the whole questionnaires were rejected and only those questionnaires that were reliable was used for analysis.

Descriptive and **inferential** statistics were employed. Descriptive statistics includes: mean, standard deviations and percentages, graphical and tabular representations to describe various aspects of the respondent's opinion. Inferential statistics was used to see if there are significant mean variations between the two organizations. The 1-5 Likert scale rating was used. The scale

is commonly anchored descriptively e.g. 5= Agree strongly, 4= agree, 3= Neutral, 2 = disagree, 1 = disagree strongly.

3.7. Models

3.7.1. Mann-Whitney U Test

The Mann-Whitney test model was used to ensure the attitude or opinion significance of effectiveness of monitoring and control of agricultural projects between MoA and EIAR. The Mann-Whitney test is a non-parametric test used to see whether two independent samples come from the population having the same distribution. It tests the hypothesis to see whether two samples come from different or identical populations. The Mann-Whitney U test, like many non-parametric tests, uses the ranked or ordinal data. The Mann-Whitney U test calculates the statistic based on the formula mentioned here:

$$U = \frac{n_1 n_2 + n_1(n_1 + 1) - R_1}{2}$$

Where U = Mann-Whitney statistic

n1 = number of items in sample 1

n2 = number of items in sample 2

R1= sum of ranks in sample 1

The test statistic for the Mann-Whitney test is U. This value is compared to the tabulated value of U statistics calculated from table. If U exceeds the critical value for U at significance level (0.05) it means that there is evidence to reject the null hypothesis in favour of the alternative hypothesis.

Chapter Four

Results and Discussion

4.1. Respondents profile

The total of 51 respondents (18 from Ethiopian Institute of Agricultural Research (EIAR) and 33 from Ministry of Agriculture (MoA)) were interviewed. Six (12%) of the respondents were female and the remaining forty five (88%) of the respondents were male. The respondents have an average age of 41.06 years with a standard deviation of 7.68. The minimum and maximum years of the respondents are 30 and 62 respectively. The respondents educational level are six (12%) of them are PhD holders, thirty nine (76%) of them are MSc/MA holders and six (12%) of them are BSc/BA holders (Figure 4). Ten (20%) of the respondents are 1-2 years of work experience in the same position, twenty (39%) of the respondents are 2-5 years work experiences and twenty one (41%) of the respondents are more than five years of work experiences in the same position.

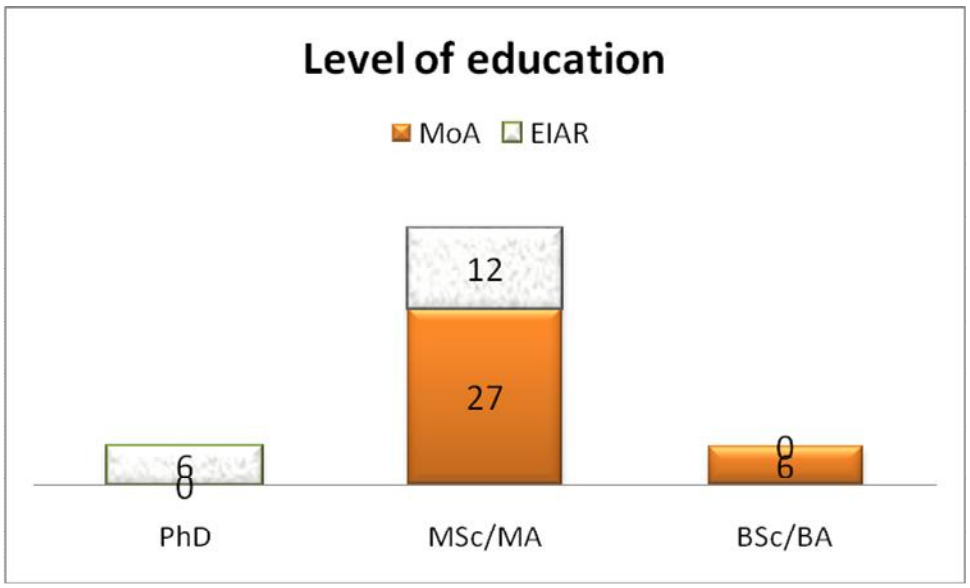

Figure 4. Level of education of the respondents

4.2. Project Monitoring Techniques (RQ 1)

According to the questionnaire survey results and different literature review have shown that MoA and EIAR uses different project monitoring techniques. Depending on the nature of the projects, the objectives the projects have, cost and time of project monitoring and the availability of resources determines in both organizations the type of project monitoring techniques.

Questionnaire is the most dominant type of project monitoring techniques in both organizations. Thirty (91%) of the respondents in MoA and eighteen (100%) of the respondents in EIAR are used questionnaire as a project monitoring techniques/ instruments. Twenty one (67%) of the respondents in MoA and eighteen (100%) of the respondents in EIAR are used interview as a project monitoring techniques/ instruments. Observation and group discussion both are used by twenty one (67%) of the respondents in MoA and fifteen (83%) of the respondents in EIAR. Twenty four (80%) of the respondents in MoA and twelve (67%) of the respondents in EIAR are used document review as a project monitoring techniques/ instruments and fifteen (45%) and nine (50%) of the respondents from MoA and EIAR are used case study as a project monitoring techniques respectively (Figure 5). Questionnaire, interview, observation, case study, focus group discussion and document review are used by both MoA and EIAR. The result indicates that both organization use different data collection techniques within a project in order to ensure that the data are telling what think they are telling or for cross check verification.

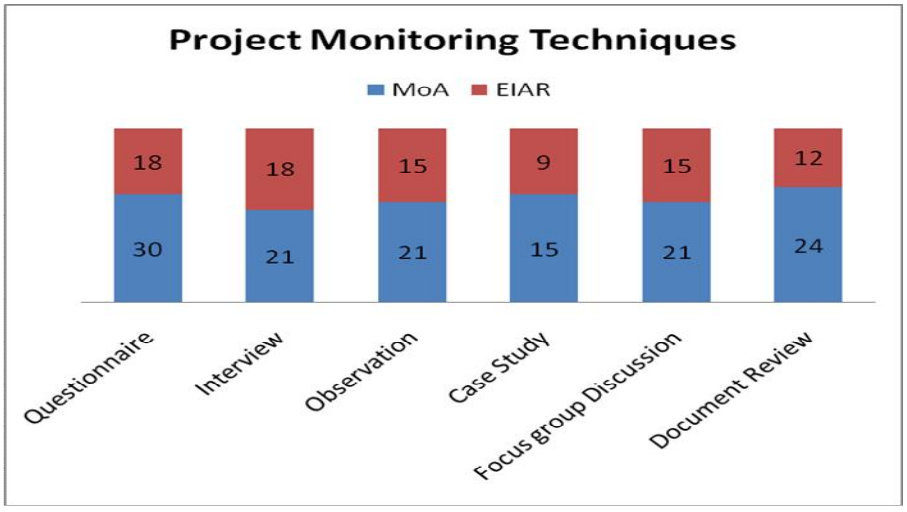

Figure 5. Project Monitoring Techniques

4.3. Effectiveness of Agricultural Project (RQ 2&3)

The respondents in both organizations were asked to indicate their general opinion on the effectiveness of agricultural project monitoring and control using Likert rating scale. The result of the analysis revealed that the mean for overall effectiveness of agricultural projects is 3.6780, 3.5569 and 3.9000 for aggregate, MoA and EIAR respectively. This shows that majority of the interviewed respondents had a positive opinion for the effectiveness of agricultural project monitoring and control (Table 2).

The result of the analysis discovered that agricultural project planning, implementation, monitoring, information management, control, efficiency and effectiveness are done in a way to achieve the intended objectives of the projects in both organizations. The mean of the result is greater than the average =3 for all variables. But the mean of EIAR respondents are higher than that of MoA respondents. The result revealed that the mean for agricultural projects in EIAR lies between 3.4365 and 4.1556 and in the MoA is between 3.2424 and 3.8990 and the aggregate mean is lies between 3.3109-3.9771 (Table 2).

All the respondents in both organizations have an opinion that agricultural project planning, implementation; monitoring, information management and control are well done which are the basis for agricultural project efficiency and effectiveness.

Table 2. Effectiveness of Agricultural Project

Likert scale mean for the Main Variables			
Main Variables	Aggregate mean (N=51)	MoA mean (N=33)	EIAR mean (N=18)
Agricultural project planning	3.9771	3.8990	4.1204
Agricultural project implementation	3.9020	3.7636	4.1556
Agricultural project monitoring	3.3109	3.2424	3.4365
Agricultural project information management	3.5350	3.3593	3.8571
Agricultural project control	3.5784	3.3434	4.0093
Agricultural project efficiency	3.8186	3.7765	3.8958
Agricultural project effectiveness	3.6993	3.5606	3.9537
Overall mean of Effectiveness	**3.6780**	**3.5569**	**3.9000**

4.3.1. Agricultural Project Planning

In both organizations the respondents have positive opinion for agricultural project planning. During project planning both organization listed down project activities, required resources, cost needed for the project, customer satisfaction criteria, information needed to share the project status to the stakeholders and stakeholders are participated during agricultural project planning. The result of the analysis revealed that the scale mean for agricultural project planning lies between 3.71-4.16, 3.64-4.09 and 3.83-4.28 for aggregate, MoA and EIAR mean respectively with Likert rating scale between 1-5 (Table 3).

Agricultural project planning enhances efficiency and effectiveness. Project planning reduces uncertainty, increases effectiveness and improves efficiency (Robert & Rudd, 2003, P.20), creates chances of project success and engagement of users, clients and stakeholders in during project planning is critical to project success (UNDP, 2009, P.7). The importance of participation of stakeholders is emphasized as stakeholder can have a different perception of value of the project, and the perception is not necessarily a business based perception of value (Harold & Frank, 2009, P.104). Key stakeholders should have some share in formulating and agreeing the project plan, because no plan can be imposed successfully in isolation and the project plan must carry the acceptance and support of those who are to be bound by it.

Table 3. Agricultural Project Planning

Agricultural Project Planning	Aggregate mean Mean (N=51)	MoA mean (N=33)	EIAR mean (N=18)
Listing of Project activities	4.02	4.00	4.06
Listing of Resources Required	3.71	3.64	3.83
Identifying Project Costs	4.16	4.09	4.28
Listing of Criteria for Customer Satisfaction	3.86	3.67	4.22
Information needed to the Stakeholders	4.12	4.09	4.17
Participation of Stakeholders	4.00	3.91	4.17
Overall mean	3.9771	3.8990	4.1204

4.3.2. Agricultural Project Implementation

Project involves many activities, project functionaries should use methods for effective implementation to complete within time, budget and quality. Recruiting of experienced project manager ahead of project implementation, assignment of core team member and subject matter experts as early as possible, allocation of all resources on time, recording of all expenses and coordinated project change management are some of the activities done during project implementation period in order to complete the project within budget, schedule and quality specification and customer satisfaction in both organizations.

The result of the analysis revealed that the scale mean for agricultural project implementation lies between 3.84-3.96, 3.64-4.00 and 3.89-4.44 for aggregate, MoA and EIAR mean respectively with Likert rating scale between 1-5(Table 4). According to the result the respondents have a positive opinion of that agricultural project implementation is executed in a smooth way according to the project plan to achieve the intended project objectives.

The chances of a risk event occurring (an error in time estimates, cost estimates, and so on) are greatest in the concept, planning, and start-up phases of the project. Every detail of a project plan will not materialize as expected during the project implementation. Establishing a change management system to deal with events that require formal changes in the scope, budget, and/or schedule of the project is an essential element of risk control. A major element of the risk control process is change management. Considering the occurrence of any project risks, both MoA and EIAR uses coordinated project change management to avert the project risk during project implementation.

Both organizations use timely resource allocation or the assignment of people, equipment, facilities, or materials to a project. Unless adequate resources are provided, project work cannot be completed on schedule, and resource allocation is a significant component of project scheduling in the organizations. When an organization or a project manager is going to manage resources in a project, organization or a project manager has to specify who is working on each task and at what allocation level in order to solve the challenges of scheduling time-constrained projects and resource-constrained projects.

Table 4. Agricultural Project Implementation

Agricultural Project Implementation	Aggregate mean (N=51)	MoA mean (N=33)	EIAR mean (N=18)
Recruiting of experienced Project Manager during planning	3.84	3.64	4.22
Assignment of Core team & SMEs as early as possible	3.92	3.64	4.44
Allocation of Resources on time	3.90	3.82	4.06
Recording of Expenses	3.96	4.00	3.89
Coordinated Project Change Management	3.88	3.73	4.17
Overall mean	3.9020	3.7636	4.1556

4.3.3. Agricultural Project Monitoring (RQ 2)

All projects are constrained by performance, time, cost and scope requirements. Because of the project constraints, the project may be out of the schedule, over budget, poor project performance or customer satisfaction. Monitoring is a continuing function that aims primarily to provide main stakeholders with regular feedback and early indications of progress or lack in the achievement of intended results. Both organizations monitor the actual performance or situation against what was planned or expected and making changes as necessary to ensure that the projects keep on track for delivering its final project objectives. MoA and EIAR are monitored and compared actual schedule and cost with planned schedule and cost to determine project schedule and cost performance. In addition they monitor effective allocation of resources to the projects and implement regular and planned monitoring of project activities to check the project activities are on the right track or not. Both MoA and EIAR monitor overall progress of the project to comparing the planned activities with actual accomplishment conducted.

According to the result the mean lies between 1.80-4.16, 1.70-4.09 and 2.00-4.28 for aggregate, MoA and EIAR mean respectively with the rating scale of 1-5 (Table 5). Majority of project monitoring scale items are greater than the average (average=3) except comparing of planned schedule and cost against earned value (<=2.00) in order to determine project schedule and cost performance. Majority of the respondents have a knowledge gap of earned value analysis.

Regular and planned monitoring, cost and schedule performance measurement and overall project accomplishment performance provide regular feedback for the project performance and shows any need for corrective actions. The project plan helps to know where the work should be. Without the project plan, both MoA and EIAR don't know where they should be, so control is impossible. Knowing where the organizations are done by monitoring progress of the projects and compared to the plan in order to take corrective action when a deviation from planned performance occurs. Monitoring of projects improves both efficiencies and effectiveness of the projects to get the intended objectives.

Table 5. Agricultural Project Monitoring

Agricultural Project Monitoring	Aggregate mean (N=51)	MoA mean (N=33)	EIAR mean (N=18)
Compared Planned vs Actual Schedule	4.12	4.09	4.17
Compared Planned vs Earned Value	1.80	1.70	2.00
Compared Planned vs Actual Cost	3.71	3.73	3.67
Compared Actual cost vs Earned Value	1.98	1.97	2.00
Monitor Effective allocation of resources to the project	3.61	3.45	3.89
Regular & Planned Monitoring	3.80	3.67	4.06
Compared overall progress (Planned vs Actual accomplishment	4.16	4.09	4.28
Overall mean	3.3109	3.2424	3.4365

4.3.4. Agricultural Project Information Management

Project information management is to collect, classify, store and distribute project information to support decision making, coordination and control in an organization. It is about how effectively manage data, how transform the data into information and useful for decision making. According to the respondents' opinion, both MoA and EIAR are used project information management. The organizations are used reliable, relevant, quality, and right and only needed information for decision making process. In addition, the organizations are communicated relevant and timely information with stakeholders, regularly analyzed data to assess achievements and challenges, documented lesson learns report and shared the progress of the project with stakeholders. The result of the analysis revealed that the mean for agricultural project information management lies

between 3.29-3.75, 3.09-3.55 and 3.67-4.17 for Aggregate, MoA and EIAR respectively with Likert rating scale between 1-5 (Table 6).

During the project planning, both organizations have set plans or processes in place to communicate relevant and timely information to stakeholders. Proper project information allows decisions regarding the use of project resources (human, material and financial) to enhance project's effectiveness. When the right information is available at the right time and to the right people it can support decisions, like changes in the implementation strategies, that can help the project reduce costs and increase its outputs. Timely project information management ensures that the project is relevant, efficient and effective within its stated objectives.

Table 6. Agricultural Project Information Management

Agricultural Project Information management	Aggregate mean (N=51)	MoA mean (N=33)	EIAR mean (N=18)
Uses of reliable, relevant and quality information	3.61	3.55	3.72
Right information is provided for decision making	3.29	3.09	3.67
Only needed information is provided for the decision makers	3.45	3.21	3.89
Communicate Relevant and Timely information to Stakeholders	3.61	3.45	3.89
Regularly analyzing data	3.55	3.39	3.83
Documented lesson learns	3.49	3.30	3.83
Share progress and results with stakeholder and others	3.75	3.52	4.17
Overall Mean	3.5350	3.3593	3.8571

4.3.5. Agricultural Project Control (RQ 3)

During implementation of the projects the organizations must ensure the achievement of the project constraints according to the project plan. The organizations must ensure projects deliver the expected benefits which are used to justify the money spent and with the specified schedule and the required specification. The structured process for checking progress and take action to

overcome any deviations from plan by the organizations is due to project control. During implementation, controls are designed to bring actual project status back into a balance with the project plan.

Both organizations have plans to control agricultural projects in case the projects are away from the right track. Both organizations develop project control activities that contribute to the mitigation of risks to the achievements of project objectives to acceptable levels. Timely project monitoring and communication for decision making process to bring the project to the right track, taking of adequate and timely action to control project deviation, expending project funds for only allowable project activities and documentation of lessons learn reports and uses for future projects are also used by MoA and EIAR in order to control agricultural projects.

The result revealed that mean for the agricultural project control is between 3.37-3.73, 2.94-3.64 and 3.89-4.17 for the aggregate, MoA and EIAR respectively with a Likert rating scale of 1-5 (Table 7). All the scale items in agricultural project control, means are above the average only developing risk mitigation strategy in the MoA is a little bit below the average (mean=2.94). The organizations verify project progress, examine constraints to progress, implement timely corrective actions in order to ensure the project effectiveness (doing the right activities) and operational efficiency (doing the activities right).

Table 7. Agricultural Project Control

Agricultural Project Control	Aggregate mean (N=51)	MoA mean (N=33)	EIAR mean (N=18)
Develop risk mitigation strategies	3.37	2.94	4.17
Timely project monitoring & communicates for corrective action	3.55	3.36	3.89
Takes adequate & timely action to control project deviation	3.65	3.42	4.06
Project funds expended for only allowable activities	3.57	3.36	3.94
Take timely corrective action	3.61	3.33	4.11
Documented lesson learn reports	3.73	3.64	3.89
Overall mean	3.5784	3.3434	4.0093

4.3.6. Agricultural project efficiency

Efficient use of project resources is a cornerstone of good project management. Project efficiency is a method project managers use to evaluate how efficiently an organization convert some fixed amount of project skills and resources into finished project deliverables. In order to implement the project efficiently both MoA and EIAR are recorded all the necessary inputs to the project work, all activities that is required to convert input to project output, identified work plan deviation and their causes and sensitization of the organization to complete the project within schedule and budget.

The result revealed that the mean for the agricultural project efficiency is between 3.59-3.96, 3.64-3.94 and 3.39-4.06 for the aggregate, MoA and EIAR respectively with a Likert rating scale of 1-5 (Table 8). All the scale items in agricultural project efficiency, the mean are above the average (Average=3).

Table 8. Agricultural Project Efficiency

Agricultural Project Efficiency	Aggregate mean (N=51)	MoA mean (N=33)	EIAR mean (N=18)
Records all Inputs	3.86	3.76	4.06
Records all Activities	3.96	3.94	4.00
Records all Outputs	3.88	3.82	4.00
Identify work plan deviation as early as possible	3.82	3.82	3.83
Screening causes of the deviation	3.76	3.64	4.00
Sensitivity of the Organization to complete the project within budget	3.59	3.70	3.39
Sensitivity of the Organization to complete the project within schedule	3.78	3.73	3.89
Assessment of overall project efficiency	3.88	3.82	4.00
Overall mean	3.8186	3.7765	3.8958

4.3.7. Agricultural Project Effectiveness

Organizations or project managers are responsible for utilizing organizational/ project resources in a way that maximizes the project outcome. These includes effective uses of resources to maximize project outcomes (secure scarce and valued skills and resources), the achievements of project organizational goals and objectives (official and operative goals), the achievements of immediate results and project objectives (creatively coordinate project resources with employees skills to satisfy changing customer needs), continuous project monitoring to improve achievement, relevancies of the outcome with the project objectives and assessment for suitability of new monitoring tools and techniques.

Both MoA and EIAR uses project resources in a way that maximizes the project outcome to enhance effectiveness of agricultural projects. According to the respondent's opinion, both organizations are doing the right things or the agricultural projects are done in a way to achieve both organizational goals and project goals. The result of the analysis revealed that the scale mean for agricultural project effectiveness lies between 3.43-3.96, 3.15-4.00 and 3.72-4.17 for aggregate, MoA and EIAR mean respectively with Likert rating scale between 1-5(Table 9). It indicates that the mean for both organization is greater than the average (average=3).

Table 9. Agricultural Project Effectiveness

Agricultural Project Effectiveness	Aggregate mean (N=51)	MoA mean (N=33)	EIAR mean (N=18)
The achievement of project organizations goals and objectives	3.96	4.00	3.89
The achievement of immediate results	3.73	3.58	4.00
Effective uses of resources to maximize project outcomes	3.69	3.67	3.72
Continuous project monitoring to improve achievement	3.69	3.42	4.17
Relevancies of the outcome with the project objectives	3.71	3.55	4.00
Assessment for suitability of new monitoring tools and techniques	3.43	3.15	3.94
Overall mean	**3.6993**	**3.5606**	**3.9537**

4.4. Organizational effectiveness of monitoring and Control for agricultural projects (RQ 4)

Effectiveness of monitoring and control of agricultural projects are affected by the project implementing organizations. The probability value is ascertained by examining the Asymp. Sig. (2-tailed). A figure of less than 0.05 is considered to be indicative of significant differences. It can conclude that there is a significant difference on effectiveness of agricultural projects between the opinion of respondents in MoA and EIAR. Because the research hypothesis was one-tailed, the *p* value would be halved, to check that the difference is in the correct direction. $U = 125.000$; $p = 0.0005$, therefore $p < 0.05$ (Table 10). Examining the mean ranks has shown that EIAR has a higher mean ranks than MoA, thus rejecting the null hypothesis and supporting the alternative hypothesis.

The overall organizational significance difference on effectiveness of agricultural project monitoring and control between MoA and EIAR arises due to different scenarios. Complexity of organizations has affects the organizational project effectiveness. MoA projects are more complex and larger than projects in EIAR. Complex projects has loose coupling among different actors which leads to loose control systems among different stakeholders. Weick (2001) argues that complex organizational boundaries can be uncertain and fluid, goals are frequently contradictory, and competing interests are held by a variety of constituencies both internal and external to the organization. Complex organization has loose coupling or loosely coupled system and loose coupling systems do not function with tight linkages, but as loose couplings of actors, technology, and rewards.

EIAR is implementing research and development projects, and the scope of these R&D projects are small in size and tested in few location relatively than those projects implemented in MoA. Small scoped projects are well managed and controlled than larger projects. Similarly, agricultural R&D projects are tested in pieces of plot of land which minimizes the environmental variation of the plot during project implementation but development projects in the MoA are implemented in a large hectare of lands and different agro-ecological zones that increases the environmental variation and complexity of agricultural project management.

Agricultural project information management is the other factors that bring significance difference on effectiveness of agricultural project monitoring and control between MoA and EIAR. Unlike to development projects, R&D projects require continuous and planned data collection in order to achieve the objectives of the projects. These continuous and planned data collection provides feed back to the R&D projects during the implementation in order to bring the project on the right track if necessary. In addition to this unlike to development projects, agricultural R&D projects are found and tested in rural town areas that enables easy flow of information among different stakeholders. But development projects are implemented in remote and unreachable areas which hinders the smooth flow of information among the stakeholders.

Table 10. Test Statistics and Mean Ranks for Organizational Effectiveness

Test Statistics[a]					**Mean Ranks**	
	Mann-Whitney U	Wilcoxon W	Z	Asymp. Sig. (2-tailed)	MoA (N=33)	EIAR (N=18)
Overall Organization effects on effectiveness of agricultural Project monitoring	125.000	686.000	-3.403	**.001**	20.79	35.56
Project Planning	269.500	830.500	-.553	.580	25.17	27.53
Project Implementation	160.500	721.500	-2.743	**.006**	21.86	33.58
Project Monitoring	217.000	778.000	-1.596	.111	23.58	30.44
Information Communication	105.500	666.500	-3.802	**.001**	20.20	36.64
Project control	91.000	652.000	-4.106	**.001**	19.76	37.44
Project Efficiency	274.000	445.000	-.460	.646	26.70	24.72
Project Effectiveness	176.500	737.500	-2.410	**.016**	22.35	32.69
a. Grouping Variable: Organization						

The other reason for the significance difference on effectiveness of agricultural project monitoring and control between MoA and EIAR is agricultural project control. Continuous, planned data collection and smooth flow of information among different stakeholders in agricultural R&D projects lead to timely control of the projects. If R&D projects exhibit deviation from the plan, the stakeholders or the project managers take immediate and timely responses in order to bring the projects on the track. But, immediate and timely responses to development projects are unlikely due to inaccessibility of information due to the remoteness of project location.

The other reason for the significance difference on effectiveness of agricultural project monitoring and control between MoA and EIAR is that EIAR has better qualified project staffs in terms of postgraduate degrees than MoA. Qualified project staffs help to improves project efficiency and effectiveness.

Agricultural project implementation is also affected by the project implementing organizations. The test statistic for project implementation reported is the Mann–Whitney U which is 160.500. It can conclude that there is a significant difference between the opinion of respondents in MoA and EIAR. Because the research hypothesis was one-tailed, the p value would be halved, to check that the difference is in the correct direction. $U = 160.500$; $p = 0.003$, therefore $p < 0.05$ (Table 10). Similarly, information communication and project control have $U = 105.500$; $p = 0.0005$ ($p < 0.05$) and $U = 91.000$; $p = 0.0005$ ($p < 0.05$), respectively (Table 10). Examining the mean ranks of project implementation, project information communication, project control and project effectiveness have shown that EIAR has a higher mean ranks than MoA, thus rejecting the null hypothesis and supporting the alternative hypothesis.

4.4.1. Organizational effectiveness of agricultural project implementation

In EIAR recruiting project manager during planning, assignments of core team members as early as possible and coordinated project change management are significant at $p < 0.05$ than the MoA (Table 11). R&D projects have a question of attainability of project objectives within time, cost, and performance constraints. Therefore, the R&D projects might be possible to achieve initial objective with high budget or modification of the project objectives as to align the objectives to the available project budget. This needs well coordinated project change management which might bring significance difference between the organizations.

In R&D projects, the project managers are assigned during project planning and mostly this is done by promoting functional managers to project managers which have better relationships with fellow researchers, prevent duplication of effort, foster teamwork, have progressed up through the technical ranks, are knowledgeable in many technical fields and understand the meaning of

profitability and general management philosophy of the organizations unlike to development projects where the project managers are assigned outside of the organization.

Table 11.Test Statistics for agricultural project implementation

Agricultural project Implementation	Mann-Whitney U	Z	Asymp. Sig. (2-tailed)
Recruiting of experienced Project Manager during planning	195.000	-2.364	**.018**
Assignment of Core team & SMEs as early as possible	138.000	-3.361	**.001**
Allocation of Resources on time	238.500	-1.513	.130
Recording of Expenses	270.000	-.597	.551
Coordinated Project Change Management	207.000	-1.911	**.056**

4.4.2. Organizational effectiveness of agricultural project information management

Agricultural project information management variable such as providing right and only needed information for decision makers, communicated relevant and timely information to stakeholders, regularly analyzing data, documenting lesson learns and sharing of progress results with stakeholders in EIAR are significant at $p < 0.05$ than the MoA (Table 12).

R&D projects in EIAR are allocated relatively in rural towns which have access to modern communication technologies that enables easily communication with stakeholders that is mostly unlike to the development projects. Providing right and only needed information for decision makers, communicated relevant and timely information to stakeholders and sharing of progress results with stakeholders using modern communication technologies in EIAR makes the difference for project information management than MoA. In R&D projects, monitoring data are analyzed regularly in order to give not only feedback to the project but regularly analyzing data are part of the R&D project components.

Table 12. Test Statistics for Agricultural project information Management

Agricultural project information Management	Mann-Whitney U	Z	Asymp. Sig. (2-tailed)
Uses of reliable, relevant and quality information	257.500	-.932	.352
Right information is provided for decision making	168.000	-2.779	**.005**
Only needed information is provided for the decision makers	144.000	-3.406	**.001**
Communicate Relevant and Timely information to Stakeholders	210.000	-1.920	**.055**
Regularly analyzing data	217.000	-1.762	**.078**
Documented lesson learns	219.500	-1.730	**.084**
Share progress and results with stakeholder and others	164.500	-2.828	**.005**

4.4.3. Organizational effectiveness of agricultural project control

All scale items in agricultural project control except documented lesson learn reports are significant at $p < 0.05$ (Table 13). Development of risk mitigation strategies, timely project monitoring and communication, taking of timely corrective action and allocation of funds only for allowable project activities in EIAR were significantly higher than that of the MoA. This is because those R&D projects in EIAR is allocated relatively in rural towns which have access to modern communication technologies that enables easily communication with stakeholders that is mostly unlike to the development projects. The other reason behind the significant variation between EIAR and MoA project control is that R&D projects in EIAR is tested in a manageable (small) size of areas that enables the project manager and project teams to easily control or minimize environmental variations and project corrective measures that affect the project control effectiveness. But development projects in MoA are done in large areas where managing environmental variation is complicated.

Table 13. Test Statistics for Agricultural project control

Agricultural project control	Mann-Whitney U	Z	Asymp. Sig. (2-tailed)
Develop risk mitigation strategies	89.000	-4.329	**.000**
Timely project monitoring & communicates for corrective action	187.000	-2.457	**.014**
Takes adequate & timely action to control project deviation	180.500	-2.624	**.009**
Project funds expended for only allowable activities	148.500	-3.241	**.001**
Take timely corrective action	121.000	-3.824	**.000**
Documented lesson learn reports	267.000	-.721	.471

4.4.4. Organizational effectiveness of agricultural project

In EIAR project effectiveness scale items such as assessment for suitability of new monitoring tools and techniques, relevancies of the outcome with the project objectives and continuous project monitoring to improve achievements are significant at $p < 0.05$ than the MoA (Table 14). In R&D projects, continuously monitoring of projects and taking of corrective measure to bring back the project on the right track if any discrepancies from the plan are considered part of the R&D project components. R&D projects are testing for new technologies to improve production by copping up environmental variations. The adaptation of new technologies to the environment is looking for new monitoring tools in order to ensure the suitability of the monitoring technique to the new technology. But development projects are used already tested technologies and they aware what kinds of monitoring tools they are used.

Table 14. Test Statistics for Agricultural project effectiveness

Agricultural project effectiveness	Mann-Whitney U	Z	Asymp. Sig. (2-tailed)
The achievement of project objectives	235.500	-1.389	.165
The achievement of immediate results	232.500	-1.394	.163
Effective uses of resources to maximize project outcomes	290.000	-.157	.875
Continuous project monitoring to improve achievement	147.000	-3.235	**.001**
Relevancies of the outcome with the project objectives	225.000	-1.770	**.077**
Assessment for suitability of new monitoring tools and techniques	133.000	-3.579	**.000**

CHAPTER FIVE

Summary, Conclusions and Recommendations

5.1. Summary of the Major Findings

The purpose of this study was to identify effectiveness of monitoring and control of agricultural projects. Effectiveness of monitoring and control of agricultural projects was done in two organizations namely MoA (Ministry of Agriculture) and EIAR (Ethiopian Institute of Agricultural Research). Different questionnaires were prepared most of them have five point Likert-style rating scale type questionnaires. Both probability and non-probability sampling techniques were employed. The data were analyzed using mean of the opinion of the respondents from five point Likert-style rating scale. In addition Mann-Whitney U test was used to check any significance difference between the opinions of the respondents in the organizations about the effectiveness of agricultural project monitoring, respectively.

According to the result obtained the main variables that have used to check the effectiveness of monitoring for agricultural projects, the mean opinion of the respondents were more than the average (mean=3) which shows that all the respondents has a positive opinion about the effectiveness of monitoring and control of agricultural projects. All main variables like project planning, project implementation, project monitoring, project information management, project control and project efficiency and effectiveness were well managed in both organization in order to achieve both organizational goals and project objectives.

Organization has its own effects on the effectiveness of monitoring for agricultural projects. Effectiveness of monitoring and control is significantly higher in EIAR than the MoA. Agricultural project implementation, effectiveness, information management and control are significantly higher in EIAR at $p < 0.05$ level of error.

5.2. Conclusions

Both MoA and EIAR are used different kinds of project monitoring techniques such as questionnaire, interview, observation, case study, focus group discussion and document review. The result of the analysis revealed that the mean for overall effectiveness of agricultural projects is 3.6780. According to the respondents' opinion, the respondents have positive opinion about the effectiveness of agricultural project. The Likert rating scale mean for agricultural project planning is 3.977, project implementation is 3.902, project monitoring is 3.311, project information management is 3.535, project control is 3.578, project efficiency is 3.819 and effectiveness is 3.678. But two of the statements or the scale items in project monitoring are poorly used or rejected at all. Comparing of planned schedule and cost against earned value (<=2.00) to determine project schedule and cost performance has negative respondents opinion. Majority of the respondents have a knowledge gap of earned value analysis.

Effectiveness of monitoring and control of agricultural projects are affected by the project implementing organizations. There is a significant difference on effectiveness of agricultural projects between the opinion of respondents in MoA and EIAR. U = 125.000; $p = 0.0005$, therefore $p < 0.05$. The EIAR has a higher mean ranks than MoA, thus rejecting the null hypothesis and supporting the alternative hypothesis. Project implementation ($p = .003$), information communication ($p = .0005$), project control ($p = .0005$) and effectiveness ($p = .008$) are significantly different between MoA and EIAR ($p < .05$). The mean ranks is 21.86 and 33.58 for project implementation, 20.20 and 36.64 for information communication, 19.76 and 37.44 for project control and 22.35 and 32.69 for effectiveness respectively for MoA and EIAR. Project implementation, information communication, project control and effectiveness are significantly higher in EIAR than MoA.

Project monitoring and control has invaluable importance to achieve both organizational goals and project objectives. Proper project management since planning, implementation, monitoring and control adds values for the achievements of project objectives. Listing down project activities, required resources, cost needed for the project, customer satisfaction criteria and others reduces uncertainty, increases effectiveness and improves efficiency of project

deliverables. Recruiting project teams during project planning helps the project teams to know the organizational goals and project objectives ahead of the project impementation time which enhances project effectiveness. Regular and planned monitoring provides feedback and early indications of progress or lack in the achievement of intended project deliverables and this helps to take corrective measures when the project is away from the schedule. Therefore, project monitoring and control has an ultimate advantage for any projects to attain the intended project outcomes.

5.3. Recommendations

Based on the findings of this study, future research and development studies and activities need to consider the forwarded recommendations.

- This study is concentrated only two organizations with foreign funded agricultural projects. In the future both foreign and government funded projects should be studied for their effectiveness and not only in the two organization but also all organization that are implementing agricultural projects.

- This study was based only on the opinion of the respondents therefore other project monitoring techniques should be considered in order to study the effectiveness of project monitoring for future study.

- Both organizations should be designed different trainings that could improve e project staffs skill in project planning, implementation, monitoring, information management, control, efficiency and effectiveness.

- The respondents in both organizations have low perceptions about earned value analysis which provides the means for integrated management of schedule, performance and cost. Therefore, project staffs in both organizations should be trained about earned value analysis. In addition Both MoA and EIAR have low culture of the use of earned value analysis, hence the organizations should encouraged the project managers and other

project staffs to use mainly and frequently earned value analysis as monitoring and control techniques for the projects to be implemented.

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Appendix 1. Self administered questionnaires

Addis Ababa University

College of Business and Economics

School of Commerce

Department of Project Management

Master of Project Management Program

The questionnaire is designed to collect information on **effectiveness of monitoring and control for Agricultural projects in your organization**. The information is going to be used as a primary data in this research which the researcher is conducting as a partial fulfillment of his study at Addis Ababa University for completing Master of Project Management. Believing that your frank and genuine responses will contribute vastly to the quality of the findings of this study, the researcher would like to ask you kindly to complete this questionnaire, as truthfully as possible.

General questions

1. Your Gender

1. Female 2. Male

2. Your age: _____

3. Number of years you have been working in this Position

1. 1 to 2 years 2. 2-5years 3. More than 5 years

4. The highest level of education you have completed

1. PHD 2. MSC/MA 3. BSC/BA 4. Diploma

5. Your educational background (the field you have studied): _____

6. What is your position in the organization/institution?

1. Project/program manager 2. Project assistance 3. Project coordinator
4. Team leader 5. Monitoring and evaluation expert
6. Technical expert 7. Support staff
8. Other (please specify):_____

7. Your organization is: 1. MoA (Ministry of Agriculture)
2. EIAR (Ethiopian Institute of Agricultural Research)

Project monitoring and controlling questions

1. What tools and techniques does your organization use to collect data? (*You can select more than one if it uses more than one technique*)

1. Questionnaire 3. Interview 4. Observation 4. Case study
5. Community book 6. Focus group discussion 7. Document review
8. No standard tools/techniques used

2. Does your organization use the logical framework approach (log frame) so as to plan M&E activities in your organization?

1. Yes 2.No

Please state the extent to which you agree or disagree the following statements 1=strongly disagree (SD), 2=Disagree(D), 3=Neutral, 4= Agree(A) & 5= Strongly Agree (SA)	Strongly Disagree Strong Agree				
Project Planning	**1**	**2**	**3**	**4**	**5**
1. The organization is outlining the project activities, tasks, dependencies and timeframes in details during the planning time					
2. The organization is listing the labor, equipment and materials and other resources required for the project during the planning time					
3. The organization is identifying the labor, equipment and materials costs during the planning time					
4. The organization is listing down the criteria to be met to gain customer satisfaction/acceptance during the planning time					
5. The organization is describing the information needed to inform stakeholders during the planning time					
6. All stakeholders are participated during project planning					
Project Implementation					
1. Skilled and experienced project manager is recruited ahead of project kick-off time/ during project planning					
2. Core team members and subject matter experts (SMEs) are assigned as early as possible for the project					
3. Resources are well allocated on time among different core and other project team members					
4. Accurately recording the actual costs/ expenses which accrue during the project implementation period					
5. Coordinated Project change management is implemented if there is a need					
Project Monitoring					
1. The organization does compare planned project activities schedule against actual schedule in order to determine project schedule performance					
2. The organization does compare planned project activities schedule against earned value in order to determine project schedule performance					
3. Financial performance of the projects is monitored by comparing the planned budget with actual expenditure to determine project cost performance					
4. Financial performance of the projects is monitored by comparing the earned value with actual expenditure to determine project cost performance					
5. The organization normally monitors how project resources of the organization like equipment are effectively employed to the project					
6. Regular and planned monitoring of project activities are done					
7. Over all progress of the project is monitored comparing of the planned activities with actual accomplishment					

	Performance efficiency	1	2	3	4	5
1.	Project management body records all inputs (financial, human and material resources)					
2.	Project management body records all Activities (tasks undertaken to transform inputs to outputs)					
3.	Project management body records all Outputs (products and services)					
4.	Project management identifies any deviations from work plans as early as possible					
5.	Project management screen out the cause(s) of the work plan deviation from the actual of the project(s)					
6.	The project manager is sensitive to complete the project activity within/ on budget					
7.	The project manager is sensitive to complete the project activity within/ on scheduled time					
8.	The Project management body assesses overall project efficiency including the efficient use of funding, time, personnel and the quality of deliverables					
Performance effectiveness						
1.	Continuous monitoring of project activities leads to the achievement of project objectives					
2.	The project work or activity has or is likely to achieve its intended, immediate results.					
3.	The project manager ensures effective use of resources, deploying them to maximize the possibility of achieving results (outcomes)					
4.	The project management teams continuously make project monitoring to improve the achievement of quality deliverables					
5.	The outcomes the organization predicted remaining relevant and effective for achieving the objective of the project					
6.	The project management teams assess suitability of new monitoring tools and techniques during implementation of the project					
INFORMATION AND COMMUNICATION						
1.	The institution obtains or generates and uses relevant, reliable and quality information to support proper implementation projects/programs of internal control.					
		1	**2**	**3**	**4**	**5**

2.	Right information is provided at the right time in the correct format to the intended management for decision making process					
3.	Only the needed information is provided to the management for making the appropriate decision					
4.	The management has processes in place to communicate relevant and timely information to stakeholders					
5.	Your organization regularly analyzes data in order to assess achievements and challenges?					
6.	Your organization documents lessons learned during project execution					
7.	Share progress and results with others					
						Project Control
1.	The institution selects and develops control activities that contribute to the mitigation of risks to the achievement of objectives to acceptable levels					
2.	The Institution evaluates and communicates internal project control deficiencies in a timely manner to those parties responsible for taking corrective action as appropriate.					
3.	The organization takes adequate and timely actions to correct deficiencies reported by the internal audit and project monitoring activities.					
4.	The organization monitors project activities to ensure that the project funds provided are expended only for allowable activities, goods, and services and communicates the monitoring results to the senior management.					
5.	The organization takes timely corrective actions if there is any deviation from the plans					
6.	The organization documents lesson learn report and uses for future projects (achievements and mistakes)					

Profuse thanks!!!

Appendix 2. Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.907	.870	58

Appendix 3. Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Sex of the respondent	181.47	350.774	-.270	.909
Experience in this position	181.14	355.201	-.287	.912
Highest level of Education	181.35	348.433	-.059	.908
Position in the Organization/Institution	179.14	347.321	-.038	.915
Organization	181.00	352.000	-.256	.910
Questionnaire	182.29	348.372	-.094	.908
Interview	182.12	349.826	-.151	.909
Observation	182.00	352.840	-.302	.910
Case Study	181.82	356.708	-.492	.911
Community book	181.41	350.327	-.314	.909
Focus group Discussion	182.06	346.856	.031	.908
Document Review	182.06	355.336	-.459	.911
Use of Logical Framework	182.29	344.772	.313	.907
Listing of Project activities	179.39	339.883	.271	.907
Listing of Resources Required	179.71	330.652	.528	.904
Identifying Project Costs	179.29	338.372	.287	.906
Listing of Criteria for Customer Satisfaction	179.71	353.172	-.175	.912
Information needed to the Stakeholders	179.37	353.598	-.224	.911
Participation of Stakeholders	179.45	339.293	.334	.906
Recruiting of experienced Project Manager during planning	179.51	351.975	-.162	.911
Assignment of Core team & SMEs as early as possible	179.55	342.573	.127	.908
Allocation of Resources on time	179.59	341.687	.257	.907
Recording of Expenses	179.53	337.894	.336	.906
Coordinated Project Change Management	179.67	349.187	-.074	.910

Compared Planned vs Actual Schedule	179.25	341.954	.250	.907
Compared Planned vs Earned Value	181.55	347.133	.003	.909
Compared Planned vs Actual Cost	179.67	325.147	.700	.902
Compared Actual cost vs Earned Value	181.37	359.118	-.610	.912
Monitor Effective allocation of resources to the project	180.06	328.816	.664	.903
Regular & Planned Monitoring	179.80	323.561	.665	.902
Compared overall progress (Planned vs Actual accomplishment	179.35	324.593	.803	.902
Records all Inputs	179.69	319.900	.786	.901
Records all Activities	179.53	321.974	.759	.901
Records all Outputs	179.63	321.878	.736	.901
Identify work plan deviation as early as possible	179.75	319.314	.797	.901
Screening causes of the deviation	179.76	315.104	.802	.900
Sensitivity of the Organization to complete the project within budget	180.06	319.456	.697	.902
Sensitivity of the Organization to complete the project within schedule	180.00	325.400	.603	.903
Assessment of overall project efficiency	179.82	322.428	.732	.902
The achievement of project objectives	179.57	323.610	.609	.903
The achievement of immediate results	179.43	317.010	.784	.900
Effective uses of resources to maximize project outcomes	179.53	328.574	.640	.903
Continous project monitoring to improve achievement	179.82	321.188	.836	.901
Relevansness of the outcome with the project objectives	179.76	324.264	.678	.902
Assessment for suitability of new monitoring tools and techniques	179.78	331.333	.471	.905
Uses of reliable, relevant and quality information	179.84	345.575	.062	.908
Right information is provided for decision making	180.16	336.695	.362	.906
Only needed information is provided for the decision makers	180.12	330.866	.542	.904
Communicate Relevant and Timely information to Stakeholders	179.65	333.193	.568	.904
Regularly analyzing data	179.88	321.386	.785	.901
Documented lesson learns	180.06	321.136	.738	.901

Share progress and results with stakeholder and others	179.65	325.313	.661	.902
Develop risk mitigation strategies	180.24	325.824	.593	.903
Timely project monitoring & communicates for corrective action	180.02	335.340	.387	.905
Takes adequate & timely action to control project deviation	179.88	331.626	.488	.904
Project funds expended for only allowable activities	179.88	334.506	.435	.905
Take timely corrective action	179.84	332.815	.478	.905
Documented lesson learn reports	179.78	329.813	.585	.904