St. Marry University College
School of Graduate Studies-MA Program

ASSESSMENT ON FACTORS AFFECTING THE EFFECTIVENESS OF MONITORING AND EVALUATIONS PRACTICES OF GOVERNMENT DEVELOPMENT PROJECTS:

THE CASES OF NATIONAL BIOGAS PROGRAM OF ETHIOPIA

By
ABIY GIRMA ABEBE

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ST MARY UNIVERSITY
SCHOOL OF POST GRADUATE STUDIES

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A RESEACH THISIS SUBMMITED TO ST. MARRY UNIVERSITY COLLEGE SCHOOL OF GRADUATE STUDIES-MBA PROGRAM IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF PROJECT MANAGMENT

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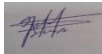
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St. Marry University College
School of Graduate Studies-MBA Program

Assessment on Factors Affecting the Effectiveness of Monitoring and Evaluations Practices of Government Development Projects: The Case of National Biogas Program of Ethiopia

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DECLARATION

I, Abiy Girma Abebe hereby declare that the thesis entitled "Assessment on Factors Affecting the Effectiveness of Monitoring and Evaluations Practices of Government Development Projects: 'The Case of National Biogas Program of Ethiopia." submitted by me for the award of master's Degree in project management is my original work and it has not been presented for the award of any other Degree, Diploma, Fellowship or any other similar titles of any other university or institutions.

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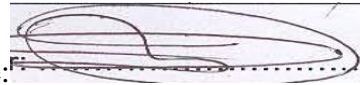ID No: - SGS/0543/2011A

Date: June, 2022

CERTIFICATION

This is to certify that Mr. Abiy Girma has properly completed his research work entitled "Assessment on Factors Affecting the Effectiveness of Monitoring and Evaluations Practices of Government Development Projects; The Case of National Biogas Program of Ethiopia) with my guidance through the time. In my recommendation, this thesis has been submitted to St. Mary's University College, School of Graduate Studies for examination with my approval as a university advisor.

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ABBREVIATIONS/ACRONYMS

ABPP	African Biogas Partnership Program
ADB	Asian Development Bank
AfDB	African Development Bank
ANOVA	Analysis of Variance
BALME	Budgetary Allocations to M&E
BCE	Biogas Construction Enterprises
BD	Bio-digesters
CIDP	County Integrated Development Program
CIMES	County Integrated Monitoring & Evaluation System
CSC	Customer Service Centre
CSHME	Competence of The Staff Handling to M&E
DDC	District Development Committees
DFRD	District Focus for Rural Development
ECPE	Ethiopia Country Program Evaluation
EMES	Effective M&E System
IFCRC	International Federation of Red Cross and Red Crescent Societies
M&E	Monitoring and Evaluations
MA	Masters in Art/Social Science
MFI	Micro-Finance Institutions
MoWE	Ministry of Water and Energy
MSc.	Masters in Natural Science
MSE	Micro and Small Enterprise MSE
SE4All	Sustainable Energy for All
NBPE +	National Biogas Dissemination Scale up Program
NBPE	National Biogas Program of Ethiopia
NBPE I	National Biogas Program of Ethiopia Phase 1
NBPE II	National Biogas Program of Ethiopia Phase 2
OLSME	Organizational Leadership of M&E

PMECs   Provincial Monitoring and Evaluation Committees

RBF   Result Based Financing

SHPS   Stakeholder Participations to M&E

SNNPR   Southern Nation Nationality People Region

SPSS   Statistical Package for Social Sciences

TUDME   Technology Utilization/Development to M&E

UN   United Nation

UNDP   United Nation Development Program

VIF   Variance Inflation Factor (VIF)

WB   World Bank

ZRESID (Y-axis)   Standardized Residuals, or errors

ZPRED (X-axis)   Standardized Predicted values of the dependent variable

ABSTRACT

Monitoring and evaluation have been critical performance management tools for project milestone planning, decision making, and implementation. The NBPE has faced significant challenges in adequately achieving the program objective and meeting the conditions required for the success of these projects. Inadequate personnel with project management skills, technology, leadership as well as insufficient financial resources, are some of the challenges that NBPE faces. The purpose of this study was to conduct research on the factors that influence the effectiveness of government development project monitoring and evaluation. The following objectives and variable have guided the researches i.e., Stakeholder participation, competency of staff handling, organizational leadership, budgetary allocation, and technology development and utilization. The descriptive and explanatory research designs were used in the study, there are approximately 110 NBPE employees, the research is conducted using a census survey method with total of 76 respondents were chosen. The descriptive statistics used in the study were generated using Statistical Packages for Social Sciences (SPSS) version 21. The study discovered that listed above factors have a positive and significant impact on the effectiveness of the M&E system in NBPE, and the study discovered that all variables have a positive and significant impact on the effectiveness of the M&E system in NBPE. Staff competency and organizational leadership were found to have the greatest impact on the effectiveness of NBPE M&E practice for government development organizations, followed by stakeholder participation and technology development and utilization. The study also discovered that each independent variables have a significant impact on the effectiveness of project monitoring and evaluation. In conclusion, the study recommends that orienting and training middle management for M&E functions, as well as rotating them into different jobs, should be part of the organization's human resource development policy.

Keywords: Factors affecting M&E practice, Effective Monitoring & Evaluations system

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

This Chapter presents an overview of the entire study. It includes the background of the study, Statement of the problem, Research questions and Objectives of the study, Significance of the study, Scope and Limitation of the study and Definition of terms and Organization of the study. The study is examined the factors Influencing the effectiveness of monitoring and evaluation systems in government development organizations in Ethiopia. Monitoring & Evaluation are the key tools where the development interventions are high priority (Musnera and Mulyungi, 2019).

It has been noticed and used by organizations for monitoring and evaluating projects/programmes for decades. The European Union, the United Nations, the World Bank and other development banks, M&E is embedded in their organizational processes (Zall Kusek and Rist, 2004). Several other organizations working in different communities adopted a results-oriented approach to its work in order to keep track of progress on its strategic programs and the corresponding outcomes and impacts (International Federation of Red Cross and Red Crescent Societies, 2011), as well as to meet the increasingly rigorous requirements of their various donors and partners as noted by (Moses Jeremiah Barasa Kabeyi, 2019)

Monitoring and Evaluation is a key management tool that helps the national biogas program of Ethiopia to move in the right direction to achieve its goals if it is used as the core the project implementation (AfDB Report, 2011). As indicated on the Appendix C which illustrates the progress of the programs with respect to the target plan, National and Regional biogas program coordination offices perform their monitoring and evaluations exercise with less effective way in order to achieve its milestone. There is also monitoring meeting conducted at national level including NBPE semi-annual performance review meetings of the Program Implementation Unit -Steering Committee joint performance evaluation meetings (Zall Kusek and Rist, 2004), also indicated Appendix C, Monitoring meetings and field visits were regularly made at all level.

Monitoring and evaluation (M&E) is valuable aspect to all projects and programs, whether it is big or small, because it helps in identifying project areas that are on target and those that

need to be adjusted or replaced. M&E also facilitates learning and knowledge generation through the analysis and objective feedback of lessons from development experience (International Federation of Red Cross and Red Crescent Societies, 2011). Good M&E system is a source of knowledge capital. It enables governments and organizations to develop a knowledge base of the types of projects, programs, and policies that are successful, and, more generally, what works, what does not, and why. It can also provide continuous feedback in the management process of monitoring and evaluating progress toward a given goal (Zall Kusek and Rist, 2004). According to Hlatshwayo and Govender, (2015) monitoring and evaluation is more than accountability, control measures and assessment of results. Rather, it includes additional purposes such as learning, programme improvement, future planning and augments capacity.

Monitoring and evaluation are becoming increasingly important for many development organizations, both government and non-government. It enables those involved in development activities to learn from their mistakes, achieve better results, and be more accountable for long-term sustainability. M&E processes enable those involved to assess the impact of a specific activity, determine how it could be improved, and demonstrate what action is being taken by various stakeholders. This should result in a more efficient and transparent working environment.

National Biogas Programme of Ethiopia was established in 2009 to coordinate a dissemination of biogas technology in Ethiopia. The program is intervening in four main regions namely, Oromia, Amhara, SNNPR and Tigray regions, and also the new regions Afar, Somalie, Benshangul-Gumuz and Gambella including the new Sidama region. More than 756 rural youths were trained during NBPE I (2009-2013), as bio-digester masons, and as of mid-2016, with a poor retention rate (10% for NBPE I trained masons), a limited number of masons are active and continuing their operations in some 262 Woredas in 2016. There are some 30 bio-digester construction enterprises (BCEs) registered and active in 2016, there are around 200 masons trained and active in the business and there are 5 MFIs providing credit to households with erratic credit availability and low repayment rates. Thus far, over 36,000 biogas digesters has been installed under the program. One of the main indicators of the program result is the number of domestic biogas digesters installed in a specified duration. In that regard, the program yearly production achievement could be

viewed that it is not growing as it was intended. From 2013 to 2022, the yearly production is declining.

The National Biogas Programme Steering Committee (chaired by the Federal State Minister for Water and Energy) at national level and Regional Biogas Programme Steering Committees presided by the regional heads of the Mines & Energy Agencies or Bureaus of Water, and Energy. The daily implementation is overseen and coordinated by the National and Regional Biogas Programme Coordination Units in collaboration with Implementing Partners at woreda (district) level. As of end of 2016 a total of 15,491 bio-digesters had been installed in some 262 woredas, out of around 600 Woredas of the large 4 regions four regions. This is only about 1% of the country's conservatively estimated technical domestic bio-digester potential. Scaling-up the dissemination of bio-digesters is one of the country's priority programmes and is included in the Sustainable Energy for All (SE4All) National Action Plan.

Based on experience in the NBPE I and NBPE II so far, the following issues need to be addressed : (a) high up-front initial capital investment for the farmers (b) household access to credit facilities is still limited and needs to be expanded and better developed, (c) the need for increased and stronger implementing capacity for promotion, and technical support at the farmer level, including on the use of bio-slurry; (d) having taken the first steps of familiarising Ethiopia with bio-digesters and engaging local stakeholders in this sector, there is need to increase in the number and types of implementing partners, the introduction of result-based financing implementation modalities and an increased focus on private sector, or Micro and Small Enterprise (MSE), and (e) beyond installation, there is a need to maintain bio-digesters quality and functionality and consequently trust with the technology.

The national biogas program of Ethiopia is intended to start kind tools which are also technology based to improve the of monitoring and evaluation practise till the sustainability of the biogas of plant even at phase out the programs which is a new data base in which the data of new biogas plants registered through mobile phone (World Bank, 2006). Some Smart Mobile phones are purchased for this purpose. The program technicians and biogas engineers of regional program coordination offices are supposed to collect the data at site. At the beginning of the exercise ABPP is expected to train (already promised to) all the program technicians and demonstrated at field. Coding are made on wet cement and some facilities such as guarantee certificate also started to use in that year. There are also another tools

which called a Customer Service Centre which is started in the end of 2018 and used for the functionality follow up and triangulation of the database information and for other data analysis for enhancing the monitoring and evaluation practise till the substantiality of projects through making ownership to the community. The program coordinators, the monitoring officer, the biogas engineers and technicians have been frequently visiting the CSC reports and chat on it to take proper action.

It would be difficult to know whether the intended results are being achieved as planned in the absence of effective monitoring and evaluation, what corrective action may be required to ensure delivery of the intended results, and whether initiatives are making positive contributions to human development (Kioko, 2017). According to Ethiopia Country Program Evaluation /ECPE (2010), in Ethiopia, most of the organizations whether governmental and non-governmental do not use monitoring and evaluation system as priority level and/or in appropriate manner for their projects and programmes. Although, existing assessment of monitoring and evaluation capacity in Ethiopia reveal gaps both institutional and individual skills development for M&E according to a report on capacity building in Africa (Ethiopia) by the (Obunga Robison, 2017).

The Government of Ethiopia have been developing different programs and projects to reduce the energy Poverty at grass root level in the way to solve cooking energy problem in the rural and urban area. The country is still experiencing coordination and harmonization difficulties with respect to monitoring and evaluation practise with respect to attaining the primary objectivity of the projects which leads to attention might be given to the factors which is affecting the effectiveness of monitoring & evaluations These are key elements that are responsible for the outcomes of another element that have been inherently interlinked. The independent variables selected in the research study included, namely; stakeholder participations, budgetary allocations, organizational leadership, competence of the staff handling to M&E and technology.

These variables are selected as key strategic factors that could help explain the relationship between themselves as a set and effective M&E. The findings of the relationship are important in the determination of informed recommendations to the entities that participated in the research study.

1.2 Statement of the Problem

Donors drive monitoring and evaluation. Most government organizations monitor and evaluate because it is required by donors and fund raisers. As a result, the majority of M&E activities are linked to donor-to-donor funding and projects and are not institutionalized. Due to a lack of demand for M&E in Sub-Saharan Africa, much of the M&E activity has occurred through donor-driven and government-based initiatives. M&E frequently addresses concerns about project inputs and outputs rather than local issues that are directly related to larger development issues. Stakeholder participation, staff competency, organizational leadership, budgetary allocation, and technology development and utilization in M&E system development: There is no participation because M&E is not part of many governments organizations' organizational culture, there is no participation in programming and designing of M&E system; they are left out in the process of determining indicators, mode of monitoring and evaluating.

Because M&E provide continuous feedback to managers, M&E systems promote organizational learning through a cycle involving the reflection of progress, learning, and mows for adjustments in the course of programs or projects as needed. Furthermore, it may take several attempts before the system can be tailored to a specific organizational policy, program, or project; however, it is possible (Zall Kusek and Rist, 2004). Information provided by monitoring and evaluation systems is used as a critical management tool in achieving results and meeting specific targets. These systems have established themselves as a powerful, continuous management tool that decision makers can use to improve performance and demonstrate results, and result-based M&E systems have a unique capacity to add to this learning and knowledge process.

M&E Systems has been identified as a key driver of project success in the country by numerous studies, but cases of project failure still occur on a regular basis. Government-funded development projects have had their fair share of successes and failures, but the practice of M&E is mandated by law (Kamau and Mohamed, 2015).

This raises the issue of monitoring and evaluation effectiveness, implementer capacity, and/or incorrect approaches and methodologies used in M&E practice by practitioners. There is also

the issue of management's role in providing the necessary support through communication, leadership styles, and employee motivation.

Monitoring and evolution can be said the heart of in every project management and very critical for the successfulness of the project executions and implementations, but it is also complex multidisciplinary skill and resources intensive process (Musnera & Mulyungi, 2019). In order to have result-based M&E system, there is fundamental requirement to improve the performance of check impact and benefits brought by the project. There is now a need to develop rules for developing minimum parameters for project monitoring and evaluation that can be used to track progress and effectiveness (Musnera and Mulyungi, 2019).

One of the drawbacks of M&E practice in Ethiopia is management's failure to implement M&E team recommendations. This defeats the purpose of the system's learning process, making the implementers vulnerable to repeating similar mistakes in future project ventures.

Better defined and built M&E systems are known for being efficiency catalysts and meeting project deliverables with relative ease. According to Mackay (2007), institutionalization of the same systems works best to improve public sector management. This is evident in Chile, the South African Public Service Commission, Canada, and Mexico (Mackay, 2007).

The study in monitoring and evaluation practise has been fast and grown, shifting from conventional methods to result-based methods. Though, monitoring and evaluation programs have developed into the non-government development organizations, but, are less established in government development organizations, limited research studies have been done on the factors that are influencing effectiveness of monitoring and evaluation systems of government development organizations in Ethiopia. Hence, an empirical gap, which this study intends to seal.

Government development organization's monitoring and evaluation practise have been developing by this time and has been given more attention in the recent period. Though, several reviews and studies show that there are still serious gaps and challenges in the M&E systems. Even if risks and external factors like federal, regional and state structure are there like bottleneck for better practise of M&E system, those identified risk not effectively monitored for timely mitigation of them. key Performance indicators not consistently used in monitoring and evaluation reports. M&E not undertaken on a timely and regular basis and reports not disseminated in time. Noticeable capacity limitation, in terms of number and skill

mix of professional staff. Inadequate incentive mechanism in the performance evaluation system for monitoring and evaluation activities (ADB, 2016).

Another startling observation was that many projects fail despite the legal requirement that they all go through M&E processes. Most academics agree that well-designed M&E processes lead to project success, but despite the prevalence of M&E activities in Kenya, there are still cases of project failure (Kamau and Mohamed, 2015).

At national biogas program of Ethiopia, there are eight regional and one national coordination unit for biogas technology dissemination including of eight to nine senior staffs excluding of program managers, with in these a huge amount of resources allocated to implement the energy technology disseminations projects and despite the fact these, projects expected to plays big role in improving the cooking energy access to rural people, nonetheless monitoring & evaluation practices faces challenges and therefore, progress and achievements doesn't as planned earlier which directly related to performance of monitoring and evaluation systems, doesn't perform acceptably and there is need for the intervention in M&E practise.

From this point of view the study was focused and conducted how the existing M&E system and practise used by the national biogas program of Ethiopia look like and identify those factors affecting the its effectiveness and recommend on how to adopt a result-based M&E system that is more effective and efficient for such government development projects in the country. Hence, this study were analysed the factors influencing effectiveness of monitoring and evaluation systems and practise at Ethiopian National Biogas program of biogas energy dissemination projects.

1.3 Research Questions

The following fundamental and sub-questions are addressed in this study, to evaluate and assess the effect of M&E factors on the effectiveness of Monitoring and Evaluation practise of the National Biogas Program of Ethiopia/NBPE organization.

The study specifically attempts to answer the following research questions for the study:

- How does project monitoring and evaluations is being practiced in NBPE?
- What extent are stakeholder participations affect the effectiveness of Monitoring and Evaluation system of National Biogas Program of Ethiopia/NBPE?

- What extent competence of the staff handling affect the effectiveness of Monitoring and Evaluation system of National Biogas Program of Ethiopia/NBPE?
- what extent does Organizational Leadership influence effectiveness of Monitoring and Evaluation system of National Biogas Program of Ethiopia/NBPE?
- What extent the Budgetary allocation affect the effectiveness of Monitoring and Evaluation system of National Biogas Program of Ethiopia/NBPE?
- what extent does Technology utilization/ development influence effectiveness of Monitoring and Evaluation system of National Biogas Program of Ethiopia/NBPE?

1.4 Objectives of the Study

1.4.1 General Objective

The general objective of this study is to assess the factors which affect the effectiveness of monitoring and evaluations practises in National Biogas Program of Ethiopia.

1.4.2 Specific Objectives

In order to achieve the stated general objective of the study, the study was focused on the following important specific objectives;

- To ascertain the M&E practices of the National Biogas Program of Ethiopia/NBPE.
- To examine how the stakeholder participations affect the effectiveness of Monitoring and Evaluation system of National Biogas Program of Ethiopia/NBPE.
- To examine how the competence of the staff handling affects the effectiveness of Monitoring and Evaluation system of National Biogas Program of Ethiopia/NBPE.
- To analyse the effect of Organizational Leadership on the effectiveness of Monitoring and Evaluation system of National Biogas Program of Ethiopia/NBPE.
- To examine how the Budgetary allocation affect the effectiveness of Monitoring and Evaluation system of National Biogas Program of Ethiopia/NBPE.
- To analyse the effect of Technology utilization/ development on the effectiveness of Monitoring and Evaluation system of National Biogas Program of Ethiopia/NBPE.

1.5 Scope of the Study

The study is mainly focusing on assessing the factors which was affect the effectiveness of monitoring and evaluations practises in National Biogas Program of Ethiopia, in which how is project planning, monitoring & evaluation practise is going to be affect by the factors and in what extent all these contribute to the overall successfulness of the implementation of the project objectives in National Biogas Program of Ethiopia.

This study was conducted within the national biogas program of Ethiopia office including some of its regional coordinating offices in which it was undertaken the dissemination biogas energy technology for the third phase of the program that was starting from April, 2017 till August 2022. The research was focused mainly on how the project construction of biogas energy technology is implementing as program document planning.

Due to the nature of Project monitoring and evaluation practices, to see the effectiveness of overall project management practice to improve project implementation. The findings of this research were more productive, after identifying those factors which was incorporated or included in other projects in the government development organizations which are in similar organizational structure and working atmospheres. The reason why this area of study is chosen because NBPE is established to solve cooking energy problem for rural and semi-rural area, the project has lot of funds and have been allocated financial supports from international development organizations and financing intuitions as a grant, two& three times but there have been still concern about the achievement of the organizations performance and its objective achievement (Zall Kusek and Rist, 2004), this study was undertaken to investigate M&E systems at national biogas program of Ethiopia.

1.6 Significance of the study

The study was helpful for Ethiopian national biogas program and its employees to identify the factors which affect project monitoring & evaluations practices and its effectiveness in which to assess how this affect the overall dissemination of biogas technology for the people in need of cooking energy, and that the such development organization needs improvement on the way the practise their M&E system on project implementation success and organizations can achieve better performance. The findings may be of great use to carry out

further research on project M&E practices. The research study is also important in such a way that it can provide ideas on the current practices of monitoring and evaluation of projects so that program managers, staffs, other project participants & stakeholders know how they are implementing monitoring and evaluation activities and identify the gaps observed in the process can take corrective action to minimize or avoid the challenges and use the opportunities identified in a better way.

This research study and its findings are going to give an important input for program developers both from international financial institutions & government organizations to improve their monitoring and evaluation system within the organization they are leading, in the designing and implementation of result-based monitoring and evaluation systems, to understand the dynamics of M&E systems to the implementation of development projects and also policies makers towards setting up of effective monitoring and evaluation systems.

1.7 Definition of Significant Terms

According to Khan (2003:11), different literature review and International Journal of Development Research; here are Definition/operational meaning of Significant Terms;

- *Effectiveness***:** The extent to which the formally stated project objectives have been or can be met.
- *Effectiveness of Monitoring and Evaluation System*: The ability of an M&E system to meet its intended or set objectives. It is the system's ability to produce expected and relevant output.
- *Monitoring***:** refers to the systematic collection and analysis of data on a daily basis during the course of project implementation.
- *Evaluation***:** is the evaluation of the effectiveness and direction of a project's activity/output or outcome; it entails making a decision and comparing the project's initial plan / objective to the actual work done.
- *Technical skill*: Knowledge and proficiency in a specific specialized field are required to complete a specific task.

➢ *Organization leadership*: These are the people in charge of making important organizational decisions and policies. Directors, senior managers, departmental managers, and line managers are among them.

➢ *Budgetary allocation***:** The process by which organizations forecast their expenditures and set aside funds to ensure that they are met when they are due.

➢ *Stakeholders' involvement***:** The process by which organizations involve people who may be affected by decisions they make or who can influence project implementation.

➢ *Competency***:** Knowledge and proficiency in a specific specialized field are required to complete a specific task.

➢ *Stakeholders***:** Individuals, groups, and institutions who are important to or have influence over the project's success.

➢ *Technology Development/Utilization:* the ability to use technological resources to achieve instructional goals in a specific teaching learning situation.

➢ *Theory of Change***:** An explanation of how a proposed project strategy will lead to the achievement of the project's Strategic Objectives.

1.8 Organization of the Study

This study is organized in five chapters. Chapter one discusses the background of the study, the research problem, the general and specific objectives, the research questions and the scope, limitation, significance and organization of the study. Chapter two presents a detailed review of the related literature and a discussion of the conceptual or theoretical and conceptual framework of the study. Chapter three discusses aspects of methodology used in conducting the research. Chapter four   deals with the discussion and analysis of findings while chapter five presents the conclusion and recommendation.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This part of the research study looks at work done by other researchers especially as it pertains and relations to the history of Monitoring and Evaluation of projects and also the most critical factors which is affecting the effectiveness of monitoring and evaluations practises. It looked at the theories that have been discovered on the effective M&E, summary of some theoretical and empirical reviews and gaps by the past scholars as pertains the effective M&E.

2.2 Theoretical literature review

Theoretical review is a collection of existing theories and models from literature which underpin conceptual framework and subsequently inform the problem statement (Ndege and Moronge, 2016). Theories are analytical tools used to comprehend, explain, and predict a given subject. A theory is a set of statements or principles developed to explain a set of facts or phenomena, especially one that has been repeatedly tested or is widely accepted and can be used to predict natural phenomena.

Theories are important in predicting, explaining and mastering phenomenon (behaviour of systems, events, activities of employees and time). Theoretical frameworks are explanations for a phenomenon, and theoretical frameworks, according Rocco and Plakhotnik, (2009), provide the researcher with a lens through which to view the world. A theory is an accepted fact that attempts to provide a plausible or rational explanation of a group of observed phenomena's cause-and-effect (causal) relationship (Robison, 2017).

According to Hoekman (2020), theories can be classified according to their scope, function, structure and levels. The relationship depicted by these theories and models is therefore reflected in this section of the literature concerning factors influencing monitoring and evaluation of IT projects.

The last two phases of the NBPE biogas project report shows that out of the targeted project plan of bio-digesters construction averagely 60% of them were achieved also indicated over the Appendix C components, even during the 3rd phase the same low implementation problem having an issue during project review meeting, i.e., at the end of project year NBPE is already implemented 50% of the project target. As you have seen from the Figure 2.1, during annual and midterm review meeting; Monitoring & Evaluation is one the cause factors of low implementation and non-functionalities to the program.
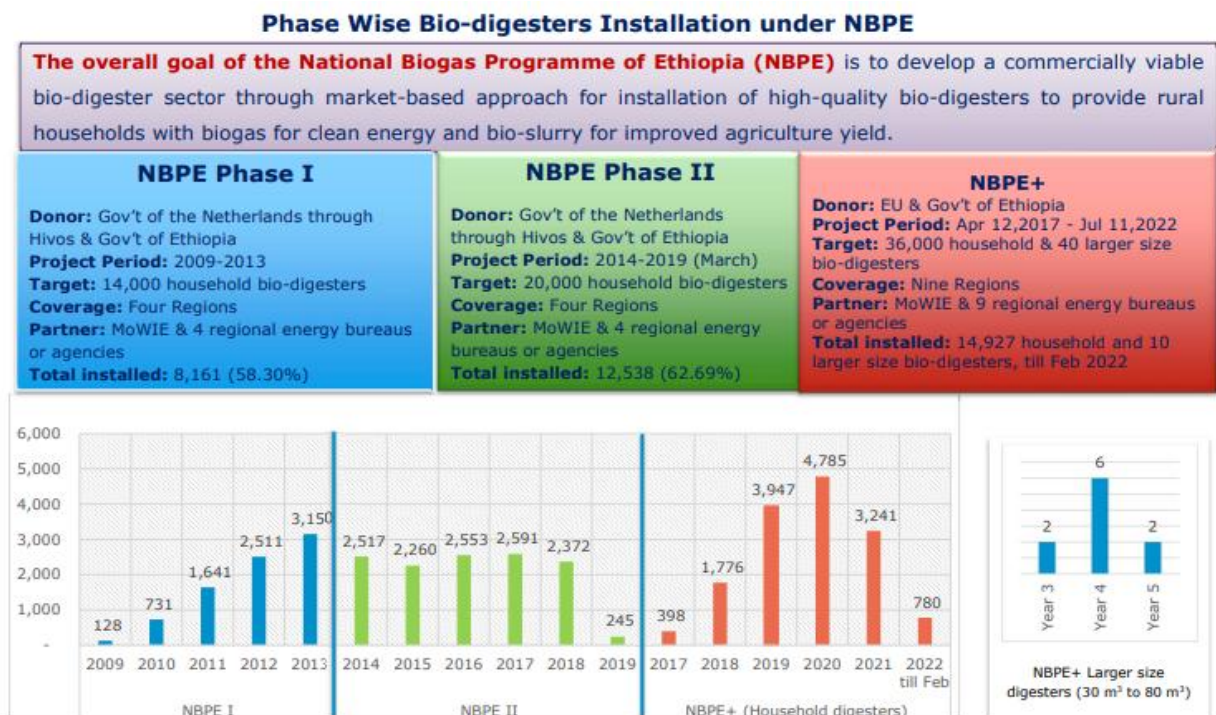
Figure 2. 1: Phase wise Bio-digesters installations under NBPE

This study is focused and centralised the research activities and findings on factors which is affecting the effectiveness of the M&E system in the NBPE, since a good M&E practise is the heart of the project implementation which also extends till the suitability and functionality of the project, the study is focused on the factors which is affecting the M&E system in the NBPE as the government organizations.

2.2.1 Concept of M&E system

Monitoring and evaluation (M&E) are tools and techniques used to assess the relationships between intentions and actions, actions and outcomes, and outcomes and impacts. However, feedback is the most important, yet frequently overlooked, aspect of monitoring and evaluation. The feedback of lessons learned from M&E aids in correcting current mistakes and improving future decisions. A results-based management and evaluation system is essentially a feedback system; it is a management tool for measuring and evaluating outcomes, providing information for governance and decision making. While monitoring inputs and outputs is important in a results-based system, providing feedback on results at the level of outcomes and goals is paramount. (Thanthirige et al., 2016).

According to Moses Jeremiah (2019) argues that good monitoring and evaluation systems for civil society programs should be dynamic, participatory, reflective, and evolving. First, dynamic systems promote 'practical learning and regular ways of seeking dynamic feedback from multiple sources about the intervention's benefits, problems, and impacts. Second, participatory and gender sensitive systems actively seek to overcome barriers such as gender, age, power, culture, and other issues that limit all stakeholders' participation in the monitoring and assessment process. Third, reflective systems encourage staff, partners, and stakeholders to set aside regular time and space for data analysis and reflection on underlying assumptions or "theories of change" that underpin interventions. Fourth, evolving systems adapt and change in order to remain as light and simple as possible while providing "real-time information that informs ongoing intervention improvement."

2.2.2 Definition and Conceptualization of M&E

The monitoring and evaluation system provides evidence for managers to assist the managerial decision-making processes. The appropriateness of the quality of the monitoring & evaluation information that feeds into existing managerial processes should be carefully reflected. Good intentions, large programs and projects, and lots of financial resources are not enough to ensure that development results were achieved: NECESSARY but not SUFFICIENT for Success! The QUALITY of those plans, programs & projects, as well as how well resources are used are also critical factors for success. This is precisely where M&E becomes INDISPENSIBLE: Without effective planning, monitoring & evaluation, it would

be difficult to judge if work is going in the right direction, whether progress & success can be claimed, and how future efforts might be improved (International and Agency, 2010).

2.2.3 Monitoring

Obunga Robison (2017), defines monitoring as the routine activity tracking of the key milestones of project performance via the results chain through data collection analysis, regular reporting and surveillance. It determines if the inputs, activities and outputs are resulting based on the plan. Inputs are resources used to carry out the project. Monitoring is the art of gathering the necessary information with the least amount of effort in order to make the right steering decision at the right time. This data also serves as an important and necessary foundation for analysis, discussion, (self-)evaluation, and reporting. Monitoring differs from evaluation in that it is a regular and systematic process that is integrated into the project/program cycle. The goal is to determine whether programs are "doing the right thing and doing it right" in order to improve their quality. Monitoring is a continuous function that primarily aims to provide project management and the primary stakeholders of an ongoing program or project with early indications of progress, or lack in program or project achievement (UNDP, 2001). Monitoring is performed while a project is being implemented, with the aim of improving the project design and functioning while in action.

Bamberger and Hewitt (1988), defines monitoring as: an internal project activity designed to provide continuous feedback on a project's progress, problems encountered, and efficiency with which it is implemented The project's annual work plan and budget are essential prerequisites for monitoring. Monitoring allows a manager to identify and evaluate potential problems as well as the success of a program or project. It serves as the foundation for substantive and operational corrective actions to improve program or project design, implementation, and results quality. Furthermore, it allows for the reinforcement of initial positive results.

The Power of Measuring Results was useful to assess the following case and effects; If you do not measure results, you cannot tell success from failure, If you cannot see success, you cannot reward it, If you cannot reward success, you are probably rewarding failure, If you cannot see success, you cannot learn from it, If you cannot recognize failure, you cannot

correct it and If you can demonstrate results, you can win public support (Obunga Robison, 2017).

2.2.4 Evaluation

Evaluation is a rigorous and independent assessment of completed or ongoing activities to determine their effectiveness in meeting stated objectives and contributing to decision making. Evaluations, like monitoring, can be applied to a variety of things, such as an activity, project, program, strategy, policy, topic, theme, industry, or organization. The primary distinction between the two is that evaluations are conducted independently to provide managers and employees with an objective assessment of whether or not they are on track. They are also more stringent in terms of procedures, design, and methodology, and generally involve more in-depth analysis. However, the aims of both monitoring and evaluation are very similar: to provide information that can help inform decisions, improve performance and achieve planned results (Tengan et al., 2021).

Evaluation is the systematic & objective assessment of an ongoing or completed project, program or policy, as well as its design, implementation and results. It involves identifying and reflecting on the EFFECTS of what has been accomplished, and judging their WORTH. seeks to determine the relevance and realization of developmental objectives, efficiency, effectiveness, impact and sustainability. To provide credible & useful information that allows the incorporation of lessons drawn into the decision-making process.

M&E provides government officials, development managers, Better means for the private sector and civil society to learn from past experiences, improve service delivery, plan and allocate resources, and demonstrate results as part of accountability to key stakeholders. Although evaluation is distinguished from monitoring, Monitoring presents what has been delivered and evaluation answers the question what has happened as a result of the intervention? Impact evaluation is a particular aspect of evaluation, focusing on the ultimate benefits of an intervention.

In government structures, effective M&E is indicated and assessed based on the following factors, namely; availability of a budget, M&E framework, CIMES structures, CIDP reporting indicators handbook, M&E champion, M&E communication strategy and M&E policy. Budgetary component serves to ensure that there is finances set aside for M&E

activities. An existing M&E policy and framework is instrumental as it affirms the legality of the process as it is robustly anchored in law. Appropriate CIMES structures ensures that within the practice itself, there are checks and balances for different assigned roles and functions to guide the implementation of M&E activities. The CIDP indicators handbook is key as it identifies the measures for assessment of status and subsequent level of implementation of M&E activities within the County. The availability of an M&E champion within the County is also vital as it campaigns for the need for institutionalization of the M&E process. A well-designed communication strategy of great importance as it provides a feedback mechanism between the government as the project implementers and the recipients.

2.2.5 Theory of Constraints

According to Popper and Koffler (1967), formulated this theory in production environment explaining that the throughput rate of a system is determined by bottleneck. This introduced theory of constraints as a means of managing a factory production process with an aim of maximizing throughput rate. Maximizing throughput rate would in turn maximize profit, cash flow and return on investment. In the multi-project environment, theory of constraints is applied as critical chain methodology using the same principle of a capacity constrained resource.

Monitoring and evaluation was shown to be an approach with significant differences to traditional critical path scheduling (Larney and Van Aardt, 2010). In a large multi-project environment, like construction industry. For example Jyh-Bin Yang, (2007) pointed out that a construction industry would benefit greatly from critical allocation of budget scheduling. The construction industry uses multiple costly resources in the context of multiple projects executed by a single company. He pointed out that there are definite benefits and did so from a theoretical basis. Case studies exists for large companies such as Impala Platinum (Philis and Gumede, 2011) and complex project such as refurbishment of C-5 but literature is sparse for urban development projects The above theory relates to the budgetary allocation on monitoring and evaluation on performance water projects.

2.2.6 Stakeholder Theory

According to Freeman (1984) seminal definition, Stakeholders are defined as "any group or individual who can influence or is influenced by an organization's achievement of its objectives." Hard-form stakeholder theory implies a duty-based moral mandate that must be accepted regardless of whether the outcomes are financially beneficial to the firm. This moral imperative necessitates that marketer identify and accept responsibility for the negative societal consequences of their actions on all stakeholders. The theory of stakeholders was perceived as normative from its inception, rooted in the recognition of various parties' ethical claims. (i.e., stakeholders) that needed to be addressed rather than being primarily a tool for the efficient management of business. In referencing Rawls (1971), Freeman (1984) notes that all parties influenced by the actions of a firm have moral and legal claims, anchored in justice, not to be negatively affected by firm-caused externalities that these stakeholders have not engendered. Stated positively, all firms have an unwavering ethical obligation to attend to the claims of affected parties (e.g., employees, customers, suppliers, the host community), insofar as the company negatively influenced or benefited from actions affecting those stakeholders.

The structural arrangements of an M&E system are important from several perspectives, one of which is the need to ensure the objectivity, credibility, and rigor of the M&E information produced by the system. Mr. Mackay (2006:19) and Khan (2003:11) agrees that the conceptual design of an M&E system should address issues such as system objectives, competent authority, information credibility, management, dissemination, and recycling into the planning process, with a special emphasis on community participation. M&E systems should be designed so that there is a demand for results information at every level of data collection and analysis. Furthermore, clear roles, responsibilities, formal organizational and political lines of authority must be established (Thanthirige et al., 2016). There is frequently a need for some structural support for M&E, such as a separate evaluation unit, which at the very least requires one person to be identified as the internal champion to ensure that the system is implemented and developed. Furthermore, the systems must be consistent with the organization's core values and work in support of the strategy. A functional monitoring and evaluation consists of twelve components: structure and organizational alignment for M and E systems; human capacity for M and E systems; M and E partnerships; M and E plans; M

and E work plans with costs; M&E system advocacy, communication, and culture; routine monitoring; periodic surveys; Databases that are useful for M&E systems Supportive supervision and data auditing; evaluation and research; and using data to improve outcomes According to Taut's (2007:53) study, "self-evaluation capacity building in a large international development organization," there is a lack of organizational readiness for learning from evaluation. Furthermore, interviewees described a lack of open, transparent, and critical intra-organizational dialogue, as well as a lack of formal structures and processes to promote reflection and learning as an organizational habit. Simultaneously, there was a high level of awareness of the potential for evaluation to be used as a tool for learning, as well as demand for such evaluations.

2.3 Empirical literature review

A number of studies on monitoring and evaluation practices have been conducted. (Tengan et al., 2021) stated that developing an effective M&E system is neither quick nor easy, but the need to strengthen institutions and learn from mistakes is critical. Canada has one of the most successful M&E systems in the world, though it took about 30 years to get to this point. (Musnera and Mulyungi, 2019) examined the Canadian M&E. 30 year history and discovered that developing a successful M&E system in an organization is determined by the amount of time, human resources, and financial resources invested in the process. The genuine need for M&E information should also exist, as a result of Canada's public sector reforms. M&E technical skills. He contended that developing the system takes years, not months, and that it should be linked to the management and decision-making processes. When backed up by a formal policy document, succinct communication on the role of M&E in projects is critical. In projects, an M&E unit ensures that the exercise is completed on time.

Musnera and Mulyungi (2019), examined the monitoring and evaluation of decentralized development in Kenya through the DFRD using Nyanza province as an example The Provincial Monitoring and Evaluation Committees (PMECs) and District Development Committees were in charge of M&E. However, the DRFD did not provide operational definitions of the terms Monitoring and Evaluation, resulting in an ambiguous authority and responsibility relationship between the Provinces and Districts. He discovered that the PMECs were not carrying out effective M&E because of a lack of operational definitions for the terms monitoring and evaluation, as well as a lack of clear delineation of responsibility

between the province and districts. Because the system did not operate systematically, it did not generate timely, accurate, and relevant information. The M&E was captured in the Districts' DDC minutes, but they did not contain the data and information required from M&E. DDC and PMEC also failed to implement the M&E tools outlined in the District Development plans. The tools he mentioned were not created with the M&E purpose in mind. The PMEC failed to generate useful information that was timely, relevant, and accurate. The main reason was that the M&E was completed in the province and woreda level instead of the project level.

Globally, according to Sam McPherson's study of Comic Relief's Monitoring, Evaluation, and Learning system, not all government organizations explicitly link their M&E systems and what they require of them with their position in the aid chain. If they did this, it would help them think more systematically about the different roles of commissioning, intermediate, and implementing in M&E, and how ME& can be designed to help them evaluate how well they are performing their specific role.

As demonstrated by the Homeless International example, understanding what data each party requires for their operations allows GOs to concentrate on the data they will use (for strategic planning, future planning, program management, donor reporting, and so on) rather than the data itself.

2.4 Summary and research gap analysis

The literature discussed in this section evidently stresses the need of having a functional M&E System built upon by requisite factors that includes; practitioner's professional capacity, professional work experiences and the capacity to adopt new and diffuse new technological innovations in the practice among others. The potential technological integration offers in Monitoring and Evaluation is immense especially when considering the upsides that includes; cost reduction, improved accuracy, richer data, greater outreach and better insights for the practice in general. Lack of skilled implementers in the practice is also a monumental challenge as it hinders productivity and efficiency in the long run. The lack of an inclusivity approach in Monitoring and Evaluation also serves to derail effectiveness of the systems under implementation by not generating a sense of project ownership and subsequent acceptance (Vladimir, 1967). Institutionalization of the Monitoring & Evaluation

culture in government is thus key as it determines the levels of transparency, accountability and certainly, commitment to success for any development intervention (Vladimir, 1967). It is also imperative that practitioners have a functional and comprehensible that promotes the utilization of M&E data into key decision-making processes by management. This literature review identifies gaps and arguments that must be validated through investigation (Kothari, 2000). Establishing an M&E system entails a combination of building blocks that do not operate in isolation but rather complement one another to produce a functional monitoring and evaluation system. Several studies have found, which is still in its infancy, is facing a number of challenges in developing its M&E system. None of the studies reviewed looked at the factors that influenced the performance of monitoring and evaluation systems in both governmental and non-governmental organizations. As a result, the study will fill a knowledge gap. This research is unique to Ethiopia, making it an important step toward closing the gap.

2.5 Conceptual framework

This was used to guide the research study as it attempted to achieve projected objectives and uses to make the analysis. It indicated a logical sequence of processes that are interlinked by both the independent and the dependent variables under investigation. stakeholder participations, budgetary allocations, organizational leadership competence of the staff handling to M&E and technology are the independent variables and effectiveness of M&E is the dependent variable.

Effective M&E System as the dependent variable is assessed in terms of functionality across all departments, this is determined by the presence or absence of the following indicators, stakeholder participations, budgetary allocations, organizational leadership competence of the staff handling to M&E and technology.

Therefore, stakeholder participations, budgetary allocations, organizational leadership competence of the staff handling to M&E and technology are selected as key strategic factors that could help explain the relationship between themselves as a set and effective M&E. The findings of the relationship were important in the determination of informed recommendations to the entities that participated in the research study.

Independent Variable

```
        ┌─────────────────────┐
        │     Stakeholder     │
        │ Participations to M&E│
        └─────────────────────┘

        ┌─────────────────────┐                          **Dependent Variable**
        │ Competence of the staff│
        │    handling to M&E   │
        └─────────────────────┘
                                              ┌──────────────────────────┐
        ┌─────────────────────┐               │ Effectiveness of M&E system│
        │    Organizational   │               └──────────────────────────┘
        │  Leadership to M&E  │
        └─────────────────────┘

        ┌─────────────────────┐
        │ Budgetary allocation to│
        │         M&E         │
        └─────────────────────┘

        ┌─────────────────────┐
        │ Technology utilization/│
        │  development to M&E  │
        └─────────────────────┘
```
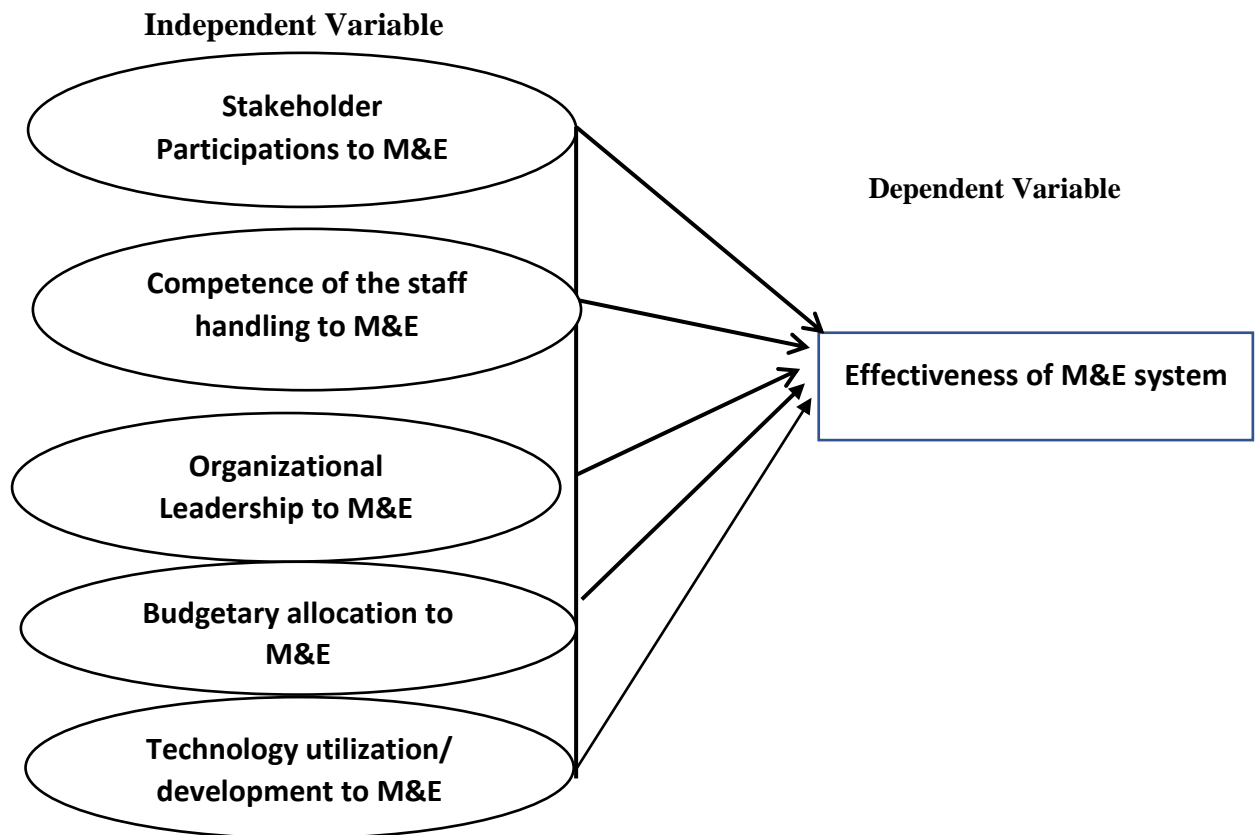
Figure 2. 1: The Study's Conceptual Framework (Adapted from Stratman & Roth, 2004

2.5.1 Independent Variables

This included Monitoring and Evaluation factors/elements that had an impact on the effectiveness of the M&E, such Stakeholder participation, competency of staff handling, organizational leadership, budgetary allocation, and technology development and utilization, which are measured through the following listed down sub questions;

2.5.1.1 Measurement of stakeholder participations to M&E

- Stakeholders are important
- How participatory they are
- Inputs from them is vital
- Engagement during the M&E practice

- Their role the project implementation and M&E system

2.5.1.2 Measurement of competence of the staff handling to M&E

- Relevant field of specialization is vital in M&E practice
- Level of education attained is a factor in implementation of M&E
- On-job trainings are key in improving M&E skills
- Capacity building of M&E practitioners is undertaken regularly
- Budget is allocated for capacity building trainings
- Usefulness and Relevance of the trainings

2.5.1.3 Measurement of organizational leadership of M&E

- Comprehension of the M&E system in place is vital
- Assessment of the M&E and giving detailed information and insights on M&E practice
- Strengthening the existing M&E
- Learning opportunities are derived from previous assignments
- Management is enough to follow M&E system
- Professionalism is essential in undertaking of M&E function
- Development of quality M&E reports

2.5.1.4 Measurement of budgetary allocations to M&E

- Any budget for implementation of M&E
- Budget is allocated for the M&E system
- Assessment of the M&E System is undertaken regularly budget
- Learning opportunities are derived by frequent budget
- Any budget for management utilizes M&E derived data in decision-making

2.5.1.5 Measurement of technology utilization/development to M&E

- Current technologies have been adopted in M&E practice

- Digital integration has been widely adopted in M&E practice

- Technology adopted has helped achieve cost reduction

- Technology adopted has improved accuracy of data obtained

- Technology adopted is responsible for better data quality

- Technology adopted is determined by cost implication

2.5.2 Dependent Variables

The monitoring and evaluation practise was measured in the following elements;

2.5.2.1 Measurement of effectiveness M&E practise/system

- Well-formulated M&E policy and budget component is available

- Well-designed M&E framework is set

- Well established CIMES structures are set

- Well-defined Integrated Development Program reporting indicators handbook is available

- Well established M&E champion is available

Well-designed M&E communication strategy is available

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter explains the proposed way of the research methodologies employed, it included description of the study areas, research approach, research design, population and sampling, instruments of data collection, method of data analysis, reliability and validity of the instrument and also includes ethical considerations.

3.2 Description of the study Area

3.2.1 Study Site Selection

This study was conducted in National Biogas Program of Ethiopia, Addis Ababa and its eight regional coordination offices. It is selected due to the fact that it is one of the government development organizations, this study was designed to examine factors affecting the effectiveness of monitoring and evaluation practice in Ethiopia national biogas program including its eight regional coordination offices.

3.2.2 Organization Description

National Biogas Programme of Ethiopia was established in 2009 to coordinate a dissemination of biogas technology in Ethiopia. The program is intervening in four main regions namely, Oromia, Amhara, SNNPR and Tigray regions, and also the new regions Afar, Somalie, Benshangul-Gumuz and Gambella including the new Sidama region. More than 756 rural youths were trained during NBPE I (2009-2013), as bio-digester masons, and as of mid-2016, with a poor retention rate (10% for NBPE I trained masons), a limited number of masons are active and continuing their operations in some 262 Woredas in 2016. There are some 30 bio-digester construction enterprises (BCEs) registered and active in 2016, there are around 200 masons trained and active in the business and there are 5 MFIs providing credit to households with erratic credit availability and low repayment rates. Thus far, over 36,000 biogas digesters has been installed under the program. One of the main indicators of the program result is the number of domestic biogas digesters installed in a specified duration. In that regard, the program yearly production achievement could be

viewed that it is not growing as it was intended. From 2013 to 2022, the yearly production is declining.

The National Biogas Programme Steering Committee (chaired by the Federal State Minister for Water and Energy) at national level and Regional Biogas Programme Steering Committees presided by the regional heads of the Mines & Energy Agencies or Bureaus of Water, and Energy. The daily implementation is overseen and coordinated by the National and Regional Biogas Programme Coordination Units in collaboration with Implementing Partners at woreda (district) level. As of end of 2016 a total of 15,491 bio-digesters had been installed in some 262 woredas, out of around 600 Woredas of the large 4 regions four regions. This is only about 1% of the country's conservatively estimated technical domestic bio-digester potential. Scaling-up the dissemination of bio-digesters is one of the country's priority programmes and is included in the Sustainable Energy for All (SE4All) National Action Plan.

3.3 Research Approach

According to Kothari (2014) the back bone of research study is the design, as it provides the components and plan for the study's success and creates a framework for seeking answers to research questions

This is both quantitative and qualitative research because the findings were obtained through the systematic collection and measurement of data, as well as the use of statistical tools. Quantitative research is the methodical and scientific investigation of quantitative qualities and occurrences, as well as their relationships. Quantitative research seeks to develop and apply mathematical models, concepts, and hypotheses to explain natural phenomena

3.4 Research Design

Descriptive research seeks to describe and understand what is being studied. It examines persons, organizations, institutions, techniques, and materials in order to describe, compare, contrast, categorize, analyze, and interpret the things and events that comprise the diverse domains of study. Explanatory research, on the other hand, seeks to establish the cause-and-effect link between variables. To analyze and make a critical evaluation of the

data/information researchers use the facts or information already available (Zegeye et al., 2009).

In this study, a descriptive research design that allowed for a determination of how stakeholder participations, competence of the staff handling to M&E, organizational leadership, budgetary allocations, and technology utilization/development contributed to the effectiveness of the M&E system. Descriptive designs require that descriptive data be collected by either or a combination of these tools, namely; questionnaires, interviews, observations, rating scales, checklists and instruments for measuring physiological variables (Cummings and Patel, 2009).

Accordingly, this study was employed descriptive and explanatory research design to describe and explain one dependent variable (effectiveness of M&E systems) was examined on how it related and was associated to other independent variables (stakeholder participations, budgetary allocations, organizational leadership, competence of the staff handling to M&E and technology) and also cross-sectional research design were employed to enable respondents describe the state of affair and factors that influence the effectiveness of M&E Systems.

3.5 Research Site

The research was conducted in National Biogas Program of Ethiopia both at national and regional coordination offices. The rationale used to assess the factors which was affect the effectiveness of the M&E practice from different aforementioned tiers.

3.6 Target Population and Sampling of the study

Population is defined by Kombo and Tromp (2006) as a group of individuals, objects, and items from which samples are taken for measurement. According to Bhattacharjee (2012) a sample is a subset of a population that shares the same characteristics as the entire population. A target population is the sum of all cases that were assigned to a specific set of conditions. The total population in this study is the employees of Ethiopia's national biogas program who work at the headquarters and regional offices.

3.6.1 Target Population

The target population was selected which are national biogas staffs, focal M&E officers, other senior's officers that integrated with biogas implementation roles. According to information obtained from Human Resource Department recently there are a total of around 110 employees. From the target population of NBPE staffs and M&E focal points, there is no need to do the sample size of n. This research is accomplished as a census survey method.

Based on this, a total of 76 responders were chosen both from national and regional offices out of 110 employees of NBPE, respondents from top level management, team leaders, unit leads and officers those directly engage in monitoring and evaluation practice, and project management functional departments. From program manager/coordinator 11, from Engineers/technicians 31, from senior staffs which were (private sector developer, general support officer, finance officer, promotion/value chain officer) 28, and from M&E expert 2 were the part of the respondents, because they are directly or indirectly involved in M&E practise and are a useful source of information at national biogas program of Ethiopia.The targeted populations of this study was answered the monitoring and evaluation practices and factors to its effects on the M&E effectiveness of Ethiopia national biogas program at both national and regional coordinating offices.

Table 3. 1: Target Population of the Study

Responsibilities/Delegations	Population	Percentage
Program Manager/Coordinator	11	100%
Engineers/Technicians	31	100%
Senior Officers	31	100%
M&E Officers	2	100%
Total	76	100%

3.7 Type and source of Data

Both primary and secondary sources of data were used for the study. Primary data were collected from respondents of the study using a structured close ended questionnaire and semi-structured interview which also attached over Appendix A. Secondary data for the study

were collected from different journals, research studies, books, articles, internet websites and report documents from the company which also presented in tabular form in Appendix C.

3.8 Instruments of Data Collection

3.8.1 Questionnaire

According to Navarro-Rivera and Kosmin (2013), because questionnaires are the best survey instrument for collecting quantitative data because they are relatively inexpensive and simple to administer, this survey study used it as a research technique. As a result, the Structure questionnaire was used to collect data for this study. Except for questions about the respondents' demographic characteristics, close-end, mostly Likert-scale questions were used to collect data from them. The close end questionnaire was designed on a five-point Likert scale, with 1 indicating Strongly Agree, 2 indicating Agree, 3 indicating Neutral, 4 indicating Disagree, and 5 indicating Strongly Disagree. The reviewed literatures provided insight into the effect of factors on M&E effectiveness in relation to project performance. The questionnaires are well-designed, with a focus on project monitoring practice evaluations practice, and its impact on the effectiveness. they are easy to process, they improve comparability, and they make it easier to show the relationship between variables.

3.8.2 Interview Checklist

Interview sessions were planned to gather relevant information about the study area, and an attempt was made to interview up to ten employees and managers from various departments of the surveyed project. Participants in the main interview session included project managers/coordinators, M&E experts, senior staff, support organization officials, and stakeholders who were deemed to be familiar with the electricity project operations of Ethiopia's national biogas program.

3.8.3 Document Review

Observation and documents related to the topic under investigation were used as additional data collection methods or techniques in this study. Tenders, agreements, reports, and action plans published by the organization (NBPE) or third parties were used as an important source of data for this purpose.

3.9 Data Presentation

The data was gathered via questionnaires and analyzed using the Statistical Package for Social Sciences (SPSS) version 22.0, as well as descriptive statistical data analysis tools such as percentage, frequency, mean, and inferential data analysis tools such as analysis of correlation and multiple regressions. The study also employed descriptive statistics, with practitioner responses presented in tabulated formats, charts, and graphs. Correlation analysis was performed to identify statistically significant and insignificant relationships between the study's dependent and independent variables. Later, regression analysis was performed using data obtained from the computation of independent variables that demonstrated statistical significance.

3.10 Reliability and Validity of the Instrument

The consistency with which an instrument produces the same results across multiple trials is referred to as its reliability. The degree to which an instrument measures what it was designed to measure is known as its validity. The concern with validity is whether the findings are truly about what they appear to be about (Cummings and Patel, 2009). The extent to which a data collection method or methods accurately measures what it was intended to measure is defined as validity (Cummings and Patel, 2009).

3.10.1 Reliability

Reliability test was conducted to check the measuring tools employee ion the study was free from error, so that the measurement instrument yields a reliable outcome. The structured questionnaire was pilot tested on practitioners from the study sample to ensure the instrument's reliability. The practitioners who took part in the pilot testing were not included in the main study. There are several different reliability coefficients. One of the most commonly used is called Cronbach's Alpha.

Reliability Statistics

Reliability Statistics

Cronbach's Alpha	N of Items
.943	35

Figure 3. 1: Reliability Statistics

The Cronbach alpha technique was used to estimate the reliability and effectiveness of the two scales of measurement of project M&E practices. Low Cronbach alpha values indicate that items do not capture the same construct, while high Cronbach alpha values indicate that items effectively measure and reflect the construct. The structured questionnaire, which was used to collect information in the study, was evaluated for validity and reliability. This was done to see if there were any inherent flaws in their measurement attributes. The Cronbach alpha test was used to determine the reliability of the Linkert scale questionnaire items using SPSS software. As a result, the score supports the presence of good internal consistency among the items and guarantees the items' reliability and acceptability for the study.

3.11 Data Quality

Supervisors checked the data for consistency and completeness, and the principal investigator double-checked it. Data quality was ensured through a variety of techniques, including training data collectors on the contents of the questionnaire and frequent supervisions. In cases of difficulty, data collectors also assisted respondents. Problems encountered during data collection were immediately reported, and appropriate actions were taken. The questionnaires and in-depth interview guides were properly designed, and a pretest was performed prior to the study, with corrections made. Missing values and inconsistencies in the questionnaires were checked. Questionnaires with a high number of missing values and inconsistencies were removed from the study and classified as non-respondents.

3.12 Methods of Data Analysis

The study also employed descriptive statistics, with practitioner responses presented in tabulated formats, charts, and graphs. Correlation analysis was performed to identify statistically significant and insignificant relationships between the study's dependent and independent variables. Later, regression analysis was performed using data obtained from the computation of independent variables that demonstrated statistical significance. Following the completion of the data collection process, the appropriate method of data analysis was used. The analysis revealed that raw data should be transformed into a form that is easy to understand and interesting. First, descriptive statistics were used to analyze the empirical data (frequency, mean and standard deviation). Following that, the data was analyzed using

statistical techniques of correlation analysis, as the study employed a Likert scale and Pearson correlation.

3.12.1 Data Processing

The principal investigator entered data into SPSS V.22 for cleaning and analysis. Every time, frequency analysis and range checks were performed to ensure data entry accuracy. Data entry errors were corrected by cross-checking with completed questionnaires.

3.12.2 Descriptive Analysis

Descriptive statistics used to capture the characteristics of the variables under study included the mean and standard deviation. It was presented in a meaningful and understandable manner to aid in describing and interpreting the research findings. To describe the socio-demographic characteristics of participants and to summarize the respondents' perceptions, descriptive statistics were computed. The data was also collected qualitatively and was first transcribed into text before being organized based on the study's objective and then analyzed by coding, giving meaning, categorization, editing, and through thematic organization and descriptive narration.

3.12.3 Analysis Using Inferential Statistics

Furthermore, inferential statistics such as Pearson correlation and regression were used to investigate the effect of the independent variable on the dependent variable. Bivariate

correlation was used in inferential statistics to analyze the relationship of the independent variable. A multiple linear regression model was used to determine the combined effect on the relationship between dependent and independent variables. Multiple linear regression can also be used to determine the model's overall fit (variance explained) and the relative contribution of each predictor to the total variance explained. When a person decides to analyze his or her data using multiple regression, part of the process includes ensuring that the data he or she wishes to analyze is available actually be analyzed using multiple regression.

3.12.4 Model Specification

Model specification - the study's statistical regression model was built on the theoretical regression model. After the results were computed, the research findings were analyzed using the multiple regression statistical analysis method. Based on the conceptual model of the study shown in equation below, the relationship between delay variables and project delay is then mathematically described using multiple regression equation models as follows.

$$Yi = \alpha + \beta1(X1) + \beta2(X2) + \beta3(X3) + \beta4(X4) + \beta5(X5) + e$$

Where **Y**= Effectiveness of M&E system

X1= Stakeholder Participations to M&E

X2= Competence of the staff handling to M&E

X3= Organizational Leadership to M&E

X4= Budgetary allocation to M&E

X5= Technology utilization/ development to M&E

e=sampling error

3.13 Ethical Consideration

According to Saunders (Saunders et al., 2007), "the appropriateness of your behavior in relation to the rights of those who become the subject of your work or are affected by it is referred to as ethics" in the context of research. The information was gathered from willing sample respondents without any unethical or coercive behavior. The study's findings were used for academic purposes only, and the responses of the participants were kept confidential. The researcher analyzed the data in aggregate without making any changes. Furthermore, the researcher respects the work of previous investigations or studies and appropriately cites those works that have been used as a basis.

CHAPTER FOUR: DATA PRESENTATION AND ANALYSIS

4.1 Introduction

This chapter of the research paper incorporates the four parts of the study in which explaining about the result and their interpretation through brief discussion. The first part discusses about the sample characteristics of the respondents is presented using descriptive statistic and then followed by correlation and regression analysis, including the discussion of the results.

4.2 Response rate

Sample and Response rate of this study which is after distributing 76 questionnaires for respondents; which are the employees of the NBPE, a total of 72 answered questionnaires were retrieved and 4 of them aren't answered, which is 94.7 % of the total distributed questionnaires. After checking the retrieved questionnaires, the questionnaires were valid for statistical analysis analyzed.

4.3 The General Background of the Respondents

The demographic information of the respondents is presented in the following table, which includes gender, age, education, position, and years of employment. The respondents were asked structured questions in order to obtain statistics on these issues, and their responses are presented and analyzed below. SPSS was used to analyze the survey results, also attached on Appendix B.

Table 4. 1: Characteristics of Respondents

Gender of Respondents			
		Frequency	Percent	Valid Percent
Valid	Male	64	84.2	88.9
	Female	8	10.5	11.1
	Total	72	94.7	100

		Frequency	Percent	Valid Percent
	Missing	4	5.3	
	Total	76	100.0	

Age of the Respondents				
		Frequency	**Percent**	**Valid Percent**
Valid	31- 40 year	27	35.5	37.5
	41-50 year	39	51.3	54.2
	>=51 year	6	7.9	8.3
	Total	72	94.7	100
	Missing System	4	5.3	
	Total	76	100	

Educational Qualification of the Respondents				
		Frequency	**Percent**	**Valid Percent**
Valid	BA/BSc Degree	37	48.7	51.4
	MSc/MA	35	46.1	48.6
	Total	72	94.7	100
	Missing System	4	5.3	
	Total	76	100	

Responsibility/Delegation of Respondents				
		Frequency	**Percent**	**Valid Percent**

Valid	Manager/Coordinator	11	14.5	15.3
	Engineer/Technician	31	40.8	43.1
	M&E Officer	2	2.6	2.8
	Senior Officer	28	36.8	38.9
	Total	72	94.7	100
Missing Total		4	5.3	
Total		76	100	

Experiences of Respondents				
		Frequency	**Percent**	**Valid Percent**
Valid	7-10 years	41	53.9	56.9
	11-15 years	27	35.5	37.5
	Above 15 years	4	5.3	5.6
	Total	72	94.7	100
Missing System		4	5.3	
Total		76		

Source: Survey Result 2022

Finally, 72 questionnaires were completed and used in data analysis, representing a response rate of 94.7 %. Gender, age, educational background, Responsibility/Delegation of Respondents, and Respondent Experiences were part of the general information questions in order to generally describe the characteristics of the respondents. The majority of respondents (84.2 %) were male, with 10.5 % being female. The study results have seen that, the age of the respondents, 27 (35.5%) of them were between 31& 40 years, 39 (51.3%) of them were

between 41 &50 years, 6(7.9%) of them were greater or equal to 50. This shows that the greater number of respondents are found between 41-50 years that is 39(51.3%).

According to the study results, The educational level of respondents reveals that 48.7 % or 37 of them have completed their first degree and 35 of them have either MA/MSc. Degree, implying that a nearly equal number of respondents have both first and second degree qualifications. In terms of responsibility/delegation, 14.5 % of respondents were managers/coordinators, 40.8 % were engineers and technicians, 2.6 % were M&E officers, and the remaining 36.8 % were senior officers. 41 (53.9 %) of respondent employees have seven to ten years of experience, 27 (35.5 %) have eleven to fifteen years of experience, and the remaining 4 (5.3 %) have more than fifteen years of experience.

4.4 Descriptive Analysis of Variables

The mean of respondents in each variable of factors indicates the average amount that each variable has a positive or negative response of respondents; the mean or average is a measure of central tendency that provides a general picture of the data. In this study, the mean of each factor was calculated along with the overall mean/average mean of their respective variables in order to conclude the effectiveness of M&E systems/practices in NBPE. The mean statistical values of the items were based on a 5-point Likert scale and were illustrated using the following assumptions: if the mean (M) score is less than 3, the respondents disagree with the statement, if the mean score is equal to 3, the respondents prefer to remain Neutral, and finally, if the mean score is greater than 3, the respondents agree with the statement.

 Accordingly, the mean scores have been computed for all the five factors which are *Stakeholder Participations to M&E, Competence of the staff handling to M&E, Organizational Leadership to M&E, Budgetary allocation to M&E and Technology utilization/ development to M&E*, even also the dependent variable *Effectiveness of M&E system* were equally weighting the mean scores of all the items under each factors. The average means result of each factor with their respective variables was separately presented, analyzed and interpreted as follows, also attached on Appendix B.

4.4.1 Stakeholder Participations to the Effectiveness of M&E Practices

Table 4. 2: Descriptive Statics of Stakeholder Participations to the Effectiveness of M&E Practices

	Items	Mean	Std. Deviation
Stakeholder Participations	Stakeholders are important	3.52	0.238
	How participatory they are	2.64	0.810
	Inputs from them is vital	3.46	0.265
	Engagement during the M&E practice	4.44	0.500
	Their role the project implementation and M&E system	3.52	0.153
Average mean of Stakeholder Participations		**3.52**	

Source: Survey Result, 2022

Table 4.2 findings shows that, engagement during the M&E practice with mean (M=4.44) which is highly agreed and also respondents agree more than normal and/neutral to the fact that the organization consider stakeholders are important for Effectiveness of M&E Practices with (M=3.52); inputs from them is vital (M=3.46); that How participatory they are to achieve Effectiveness of M&E Practices of the organization (M=2.64); their role the project implementation and M&E system (M=3.52). These findings indicate that stakeholder participation in the effectiveness of M&E Practices is above average, which is required in order to improve the effectiveness of M&E Practices in the organization (Hlatshwayo & Govender, 2015), as literature indicates that stakeholder participation is critical for the effectiveness of M&E Practices in many organizations as it can improve the organizations M&E Practices and core competencies.

4.4.2 Competence of the Staff Handling to the Effectiveness of M&E Practices

Table 4. 3: Descriptive Statistics of Competence of the staff handling to the Effectiveness of M&E Practices

	Item	Mean	Std. Deviation
Competence of the staff handling	Relevant field of specialization is vital in M&E practice	2.83	0.904
	Level of education attained is a factor in implementation of M&E	2.80	0.867
	On-job trainings are key in improving M&E skills	2.51	0.581
	Capacity building of M&E practitioners is undertaken regularly	2.44	0.648
	Budget is allocated for capacity building trainings	3.52	0.184
	Usefulness and Relevance of the trainings	2.64	0.810
Average mean of competence of the staff handling		**2.79**	

Source: Survey Result, 2022

N=72

Competence of the staff handling is the other critical factors to the Effectiveness of M&E Practices. Table 4.3 represents that respondent agree around normal to the fact that on-job trainings are very important in effective M&E system with mean value (M=2.51), level of education attained also another factor in implementation of M&E practice with mean value (M=2.80), others like Relevant field of specialization is vital in M&E practice, budget is allocated for capacity building trainings and usefulness and Relevance of the trainings also shows with mean values of (M=2.86, M=2.44 & M=2.64), respectively, These finding shows competence of the staff handling have normal effect to enhance M&E of the organization, (World Bank, 2006) as literature indicate that, competence of the staff handling had a positive significant impact on effectiveness of M&E practices;

4.4.3 Organizational Leadership of the Effectiveness of M&E Practices

Table 4. 4: Descriptive Statistics of Organizational Leadership of the Effectiveness of M&E Practices

	Item	Mean	Std. Deviation
Organizational Leadership	Comprehension of the M&E system in place is vital	2.82	0.893
	Assessment of the M&E and giving detailed information and insights on M&E practice	2.42	0.599
	Strengthening the existing M&E	3.53	0.182
	Learning opportunities are derived from previous assignments	2.63	0.795
	Management is enough to follow M&E system	2.81	0.882
	Professionalism is essential in undertaking of M&E function	3.51	0.132
	Development of quality M&E reports	3.10	0.715
Average mean of Organizational Leadership		**2.98**	

Source: Survey Result, 2022

As per the findings of the study, the respondents agreed to the extent that the organization leadership management have an impact to the effectiveness of M&E practice with mean (M= 3.53 & M=3.51) Strengthening the existing M&E, and Professionalism is essential in undertaking of M&E function respectively. Others items have mean value starting from 2.42 till 3.10. The respondents from the perspective of descriptive statistics indicated that the respondents are agreed normally to the fact that organizational leadership effect of effective M&E practice of NBPE. This result indicated that organization with strong leadership was motivated the employees to play a great role the monitoring and evaluation system in their organizations.

4.4.4 Budgetary Allocation to Effectiveness of the M&E Practices

Table 4. 5: Descriptive Statistics of budgetary allocation to the Effectiveness of M&E Practices

	Items	Mean	Std. Deviation
Budgetary allocation	Any budget for implementation of M&E	2.51	0.581
	Budget is allocated for the M&E system	2.43	0.624
	Assessment of the M&E System is undertaken regularly budget	2.51	0.581
	Learning opportunities are derived by frequent budget	3.53	0.182
	Any budget for management utilizes M&E derived data in decision-making	2.43	0.624
Average mean of Budgetary allocation		**2.68**	

Source: Survey Result, 2022

N=72

Table 4.5 describes that respondent agree above normal mean value is only that Learning opportunities are derived by frequent budget (M=3.53) which is derived by frequent budget and Any budget for management utilizes M&E derived data in decision-making items and for the rest items under Budgetary allocation are below mean value of normal, i.e., M=2.43 and M= 2.51. budget is a key component of M&E system effectiveness in the organizations. as literature indicated (Vladimir, 1967).

4.4.5 Technology Utilization/Development to the Effectiveness of M&E Practices

Table 4. 6: Descriptive Statistics of Technology utilization/development to the Effectiveness of M&E Practices

	Item	Mean	Std. Deviation
Technology utilization/ development	Current technologies have been adopted in M&E practice	2.83	0.904
	Digital integration has been widely adopted in M&E practice	4.44	0.500
	Technology adopted has helped achieve cost reduction	3.52	0.153
	Technology adopted has improved accuracy of data obtained	3.46	0.265
	Technology adopted is responsible for better data quality	3.52	0.184
	Technology adopted is determined by cost implication	3.52	0.153
Average mean of Technology utilization/development		**3.55**	

Source: Survey Result, 2022

N=72

Table 4.6 illustrates that respondent agree above normal mean value that Technology utilization and development play a vital role for effective M&E practice in the organizations, Digital integration adopted in M&E practice; M=4.44, Technology adaptation for cost implication, for better data quality and to achieve cost reduction have mean value (M=3.52) which are high value, indicate that technology utilization & development was enhanced the effective M&E system, This finding shows Technology utilization and development play a vital role for effective M&E practice in the organizations, as literature indicate positively

affects organization M&E system (Musnera and According to Kothari (2014) Mulyungi, 2019).

4.4.6 Descriptive Statistics of factors affecting the Effectiveness of M&E Practices

Table 4. 7: Descriptive Statistics of factors affecting the Effectiveness of M&E Practices

Descriptive Statistics			
	N	Mean	Std. Deviation
Stakeholder Participations to Effectiveness of M&E Practices	72	3.49	0.230
Competence of the Staff Handling to Effectiveness of M&E Practices	72	2.79	0.499
Organizational Leadership of Effectiveness of M&E Practices	72	2.97	0.362
Budgetary Allocation to Effectiveness of M&E Practices	72	2.68	0.469
Technology Utilization/Development to Effectiveness of M&E Practices	72	3.55	0.263
Valid N (list wise)	72		

Source: Survey Result, 2022

From the table 4.7 above, the mean score values of factors affecting the M&E practices ranges between 2.65 (mean score value of Budgetary Allocation) with standard deviation of 0.469 till 3.55 (means score value of Technology Utilization/Development) with standard deviation of 0.263. From these findings Technology Utilization/Development has the highest mean score which incriminates the Effectiveness of M&E Practices positively significant impact on organization M&E system; Stakeholder Participations and Organizational Leadership have good competitive advantage to the M&E practices of an organizations; in turn positively affects.

4.4.7 Effectiveness of M&E system

Table 4. 8: Descriptive Statistics of Effectiveness of M&E system

	Item	Mean	Std. Deviation
Effectiveness of M&E system	Well-formulated M&E policy and budget component is available	2.83	0.904
	Well-designed M&E framework is set	3.46	0.265
	Well established CIMES structures are set	2.51	0.581
	Well-defined Integrated Development Program reporting indicators handbook is available	2.43	0.624
	Well established M&E champion is available	3.52	0.153
	Well-designed M&E communication strategy is available	2.64	0.810
Average mean of Effectiveness of M&E system		**2.9**	

Source: Survey Result, 2022

N=72

Components under effectiveness of the M&E system shows that, most respondents revealed below neutral mean value/normal which tends to disagreement for the effectiveness of M&E practice in NBPE. Only mean average of M=3.52 which implies Well established M&E and M=3.46 of Well-designed M&E framework plays a vital role in the Effectiveness of M&E system in development organizations. One development organization must require an effective M&E practice including Stakeholder Participations, Competence of the staff handling, Organizational Leadership, Budgetary allocation and Technology utilization/

development to M&E system, not only for effectiveness of the M&E system but also for achieving the objective of project scope.

4.5. Correlation Analysis

The correlation between independent and dependent variables was examined using the Statistical Package for Social Science (SPSS). The correlation matrix below depicts the Pearson Correlation coefficient-based correlation between variables in the questionnaire. As a result, in this research study, the Bivariate Pearson Coefficient (r) was used to examine the relationship between the variables using a two-tailed statistical significance test at a level of 95 percent significance, P 0.01. The size of the correlation coefficient (r) is interpreted as follows, also attached on Appendix B.

Table 4.9 shows the relationship among the variables considered in the questionnaire.

Table 4. 9: Pearson Correlation Matrix

		Stakeholder Participations	Competence of the staff handling	Organizational Leadership	Budgetary allocation	Technology utilization / development	Effectiveness of M&E system
Stakeholder Participations	Pearson Correlation						
	Sig. (2-tailed)						
	N	72					
Competence of the staff handling	Pearson Correlation	.720**					
	Sig. (2-tailed)	.000					
	N	72					
Organizational Leadership	Pearson Correlation	.730**	.939**				
	Sig. (2-tailed)	.000	.000				
	N	72	72				
Budgetary allocation	Pearson Correlation	.736**	.831**	.757**			
	Sig. (2-tailed)	.000	.000	.000			
	N	72	72	72	72		
Technology utilization / development	Pearson Correlation	.896**	.825**	.834**	.700**		
	Sig. (2-tailed)	.000	.000	.000	.000		
	N	72	72	72	72		
Effectiveness of	Pearson Correlation	.676**	.958**	.916**	.851**	.723**	

M&E system	Sig. (2-tailed)	.000	.000	.000	.000	.00	
	N	72	72	72	72	72	72
**. Correlation is significant at the 0.01 level (2-tailed).							

Source: Survey Result, 2022

If the correlation coefficient is between 0.1 and 0.20, it is slight correlation or small; between 0.20 and 0.40, it is low correlation or weak relationship; between 0.40 and 0.70, it is moderate; between 0.70 and 0.90, it is high correlation or substantial relationship; and between 0.90 and 1.00, it is very high correlation or very strong correlation between variables (Burns, 2008).

The above correlation matrix indicates that factors affecting the M&E practice were positively and moderately correlated with the organization's M&E system. The highest strong coefficient of correlation in this research is competence of the staff handling with the effectiveness of M&E system (r=0.958, n=72, $p \leq 0.01$). It can note that there is a significant positive relationship between competence of the staff handling and the effectiveness of M&E system.

The second highest strong coefficient of correlation is between organizational leadership and the effectiveness of M&E system (r =0.916, n =72, $p \leq 0.01$). Hence, there is a significant positive relationship between organizational leadership and the effectiveness of M&E system.

The third coefficient of correlation is between budgetary allocation and the effectiveness of M&E system (r =0.851, n =91, $p \leq 0.01$). Hence, there is a significant positive relationship between competitive budgetary allocation and the effectiveness of M&E system.

The fourth coefficient of correlation is between Technology utilization/ development and the effectiveness of M&E system (r =0.723, n =72, $p \leq 0.01$). Hence, there is a significant positive relationship between Technology utilization/ development and the effectiveness of M&E system.

The fifth coefficient of correlation is between Stakeholder Participations and the effectiveness of M&E system (r =0.676, n =72, $p \leq 0.01$). Hence, there is a significant positive relationship between Stakeholder Participations and the effectiveness of M&E system.

Generally, the above correlation matrix shows that all variables are positively and moderately correlated with the dependent variable. In general, the finding depicts that all are important determinants of the effectiveness of M&E system and significant to show the effect all factors on the of M&E Practice.

On the above correlation table, the numbers next to Sig. (2-tailed) shows that all are (.000). The convention implies that if this value is less than .05, then the correlation is considered to be significant (meaning that the researcher can be 95% confident that the relationship between variables is not due to chance). The researcher can connote that there is a significant correlation between the M&E factors and the effectiveness of M&E system.

4.6. Regression Analysis

The technique of regression is used to predict the value of a dependent variable using one or more independent variables (Albaum, 1997). Regression analysis is a statistical technique used to investigate relationships between variables. Typically, the investigator seeks to determine the effect of one variable on another. To investigate such issues, the investigator collects data on the underlying variables of interest and uses regression to estimate the quantitative effect of the causal variables on the variable under consideration. The investigator will also typically evaluate the "statistical significance" of the estimated relationships, which is the degree of certainty that the true relationship is similar to the estimated relationship (Navarro-Rivera and Kosmin, 2013).

$$Y_i = \alpha + \beta_1(X_1) + \beta_2(X_2) + \beta_3(X_3) + \beta_4(X_4) + \beta_5(X_5) + e$$

4.6.1 Linear Regression Analysis

According to Yanamandram and White (2005) Meeting the regression analysis assumptions is required to confirm that the obtained data accurately represented the sample and that the researcher obtained the best results. Linear regression is a fundamental and widely used type of predictive analysis. The overall goal of regression is to investigate two things: (1) How well does a set of predictor variables predict an outcome (dependent) variable? (2) Which variables, in particular, are significant predictors of the outcome variable, and how do they influence it (as indicated by the magnitude and sign of the beta estimates)? These regression estimates are used to explain the relationship between one or more independent variables and one dependent variable.

$$y = c + b*x,$$

where y = estimated dependent variable score, c = constant, b = regression coefficient, and x = score on the independent variable.

4.6.1.1 Multicollinearity

Check for the presence of multicollinearity if there are high correlations between some of the independent variables. The Variance Inflation Factor (VIF) is used in the study to calculate the impact of correlations among independent variables on the precision of regression estimates. The VIF factor should be less than 10 and ideally close to one.

Tolerance measures how much of the variability of the specified independent variable is not explained by the other independent variables in the model and is calculated for each variable using the formula $1-R^2$. If this value is very low (less than 0.10), it indicates that the multiple correlation with other variables is high, implying multicollinearity.

A good regression model must not have a strong correlation among its independent variables or a multicollinearity problem, and the variance inflation factor (VIF) must be between 1 and 10, with a tolerance level greater than 0.2. as suggested by Frost (2017).

Table 4. 10: Multicollinearity Test

Coefficients[a]		
	Collinearity Statistics	
Model	**Tolerance**	**VIF**
Stakeholder Participations to M&E	.146	6.836
Competence of the staff handling to M&E	.074	13.484
Organizational Leadership to M&E	.104	9.605
Budgetary allocation to M&E	.225	4.448
Technology utilization/ development to M&E	.109	9.134
a. Dependent Variable: Effectiveness of M&E system		

As shown on the table above, based on the coefficients output (collinearity statistics), the obtained variance inflation factor (VIF) for four independent variables was found to be between 1 and 10, which means that there is no multicollinearity problem, only one independent variable has more than 10 which is 13.484 shows multicollinearity problem.

4.6.1.2 Homoscedasticity

In regression analysis, homoscedasticity is the assumption that the residuals at each level of the predictor variables have similar variances. That is, the spread of residuals should be fairly constant along any predictor variable. A basic analysis begins with the researcher plotting *ZRESID (Y-axis) against *ZPRED (X-axis) on SPSS because this plot is useful in determining whether the assumptions of random errors and homoscedasticity have been met.

The *ZRESID and *ZPRED graphs should resemble a random array of dots evenly distributed around zero. If this graph funnels out, there is probably heteroscedasticity in the data. If there is a curve in this graph, it is likely that the data violated the assumption of linearity.
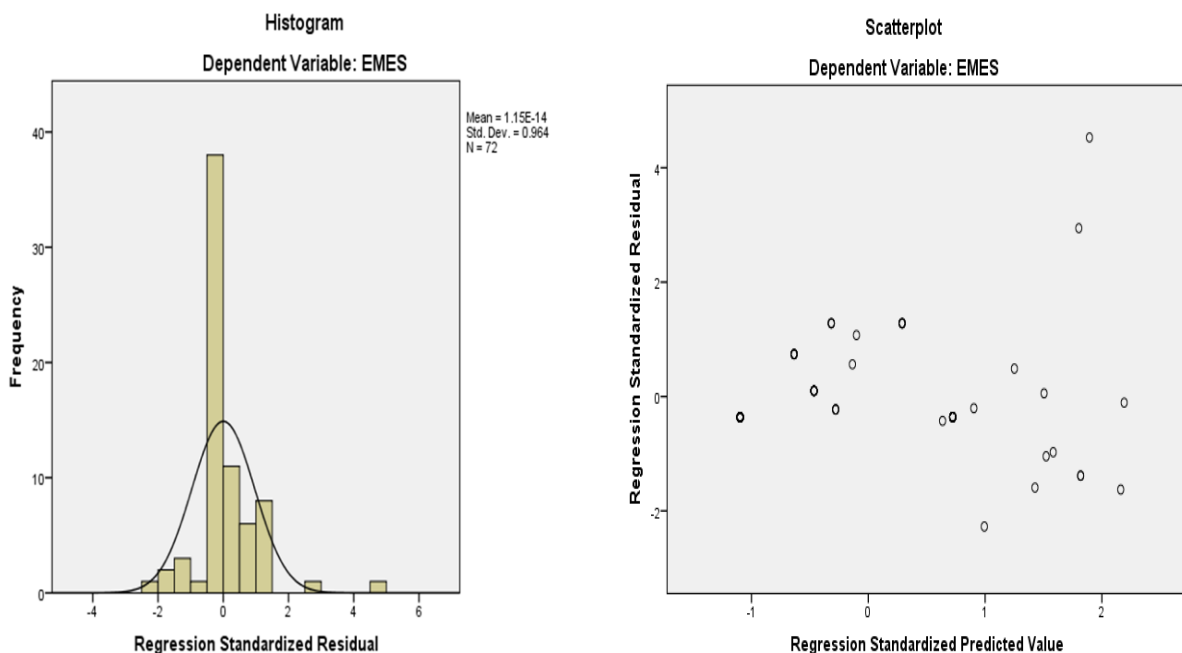
Figure 4. 1: Scatter Plot of Regression Standardized Residual

4.6.1.3 Linearity

The degree to which the change in the dependent variable is associated with the change in the independent variable was represented by the linearity of the relationship between the dependent and independent variables (Yanamandram and White, 2005). Linear models predict values that fall in a straight line by assuming a constant unit change (slope) of the dependent variable for a constant unit change of the independent variable. The study looks for patterns in scatter plots of factors influencing M&E practice versus the effectiveness of the M&E system to see if they have a linear relationship and if the assumptions are met. The graph above shows that the effectiveness of the M&E system and the factors influencing M&E practice did not have a linear relationship/cause and effect.

4.6.1.4 Independent errors

The residual terms should be uncorrelated for any two observations (or independent). This is sometimes referred to as a lack of autocorrelation. The Durbin–Watson test, which looks for serial correlations between errors, can be used to test this assumption. It specifically checks to see if adjacent residuals are correlated. The test statistic ranges from 0 to 4, with a value of 2 indicating that the residuals are uncorrelated (Shutt, 2012). The Durbin–Watson test result value in Table 4.11 is 1.113, which is so close to 1, indicating that the residuals are uncorrelated in some way (or independent).

4.6.2 Multiple Linear Regression Analysis

Linear regression calculates the coefficients of a linear equation that includes one or more independent variables and best predicts the value of the dependent variable (Shutt, 2012). Multiple linear regression was used to determine the explanatory power of the independent variables (stakeholder participations, competence of the staff handling, organizational leadership, budgetary allocation, and technology utilization/ development) in order to identify the relationship and the most dominant variables influencing M&E practice. The significance level of 0.05 was used, with a 95% confidence interval. Multiple regression analysis was used to evaluate the direct effect of these variables on the effectiveness of M&E practice. The

model summary of the regression analysis is shown in table 4.9, also attached on Appendix B.

Table 4. 11: Model Summary for effective M&E practice

Model Summary										
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin Watson
					R Square Change	F Change	df1	df2	Sig. F change	
1	.979[a]	.958	.955	.08312	.958[a]	300.267	5	66	.000	1.113

 a. Predictors: (Constant), TUDME, BALME, OLSME, SHPS, CSHME

 b. Dependent Variable: EMES.

Source: Survey Result, 2022

The above regression model shows how much of the variance in the measure of M&E system Effectiveness is explained by M&E factors variables. To further explain R, R2, adjusted R2, and Durbin–Watson, also attached on Appendix B.

R - Indicates the multiple correlation coefficient between the predictors and the outcome, with a value ranging from 0 to 1, with a larger value indicating a stronger correlation and 1 representing an equation that perfectly predicts the observed value (Tompkins, 1991). According to the model summary (R = 0.979), the linear combination of the five independent variables (stakeholder participation, staff handling competence, organizational leadership, budgetary allocation, and technology utilization/development) strongly predicts the dependent variable (the effectiveness of M&E system).

R Square (R^2) - indicates the proportion of variance in the dependent variable that can be explained by the linear combination of the independent variables. R^2 is a measure of how much of the variability in the outcome is explained by the predictors. R^2 values also range from 0 to 1. (Tompkins, 1991). The linear combination of M&E factors variables or predictors, namely stakeholder participation, staff handling competence, organizational

leadership, budgetary allocation, and technology utilization/development, explains 95.8 % of the variance in M&E system effectiveness, with the remaining 4.2 % explained by extraneous variables not included in this regression model.

Adjusted R Square (R²) - The adjusted R2 indicates how well the model generalizes, and its value is the same as, or very close to, the value of R^2. That is, it modifies the R^2 value to better represent the population under study (Tompkins, 1991). The difference for the final model is negligible (in fact, the difference between R^2 and Adjusted R^2 is negligible) (.958 - .955 = .003) which is about 0.3%. This shrinkage means that if the model were derived from the population rather than a sample it would account for approximately 0.3% less variance in the outcome.

Durbin-Watson - The Durbin–Watson statistic indicates whether or not the assumption of independent errors is acceptable. According to the conservative rule, values less than one or greater than three should definitely raise red flags (Moses Jeremiah, 2019). As a result, when the value is close to 2, the desired result is obtained, and for this data the value is 1.113, which is close to 1 that the assumption has certainly been met.

Table 4. 12: ANOVA of effective M&E practice

ANOVAᵃ						
Model		**Sum of Squares**	**Df**	**Mean Square**	**F**	**Sig.**
1	Regression	10.374	5	2.075	300.267	.000ᵇ
	Residual	.456	66	.007		
	Total	10.830	71			
a. Dependent Variable: effectiveness of the M&E system/ EMES						
b. Predictors: M&E factors/SHPS, CSHME, OLSME, BALME, TUDME,						

Source: Survey Result, 2022

In the **ANOVA** sub table above, we have the F value of 300.267 which is significant with p <1. This informs us that the five independent variables taken together as a set are significantly related to the dependent variable. Therefore, we can conclude that our regression model results in significantly better prediction of effectiveness of the M&E system and that the regression model overall predicts the M&E practices significantly well.

4.6.2.1 The Regression Coefficient

The purpose of this study is to identify the independent variable that has the greatest influence on the prediction of the dependent variable. Thus, the standardized Beta coefficient can be used to investigate the strength of each predictor (independent variable) influencing the criterion (dependent variable).

The regression coefficient explains how much change in the dependent variable is caused by a unit change in the independent variable. The greater the value of an independent variable's Beta coefficient, the more support the independent variable has as the more important determinant in predicting the dependent variable.

Table 4. 13: Summary of Coefficient on effective M&E Practice

Model		Unstandardized Coefficients		Standardized Coefficient	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(constant)	1.168	.181		6.464	.000	.807	1.529
	Stakeholder Participations	.276	.112	.163	2.464	.016	.052	.499

Competence of the staff handling	.613	.073	.783	8.441	.000	.468	.758
Organizational Leadership	.331	.084	.307	3.923	.000	.163	.499
Budgetary allocation	.123	.044	.148	2.775	.007	.034	.211
Technology utilization/ development	-.635	.113	-.428	-5.607	.000	-.861	-.409

Dependent Variable: effectiveness of the M&E system/ EMES

Source: Survey Result, 2022

The marked column B is the value for the intercept (a) in the regression equation on the first row, labelled (constant). The numbers below the column ''βeta'' are the values for the regression coefficients for stakeholder Participations, competence of the staff handling, organizational leadership, budgetary allocation, technology utilization/ development. In the multiple regression, this standardized regression coefficient Bate (β) is useful, because it allows you to compare the relative strength of each independent variable's relationship with the dependent variable (Tompkins, 1991).

The above coefficient table shows the constant beta value (β) and p-value of the variables to examine the significance of independent variables. The significance level of each variable (P-value) is: .016, .001, .001, .007 and .001 and their standardized coefficients are .163, .783, .307, .148 & -.428 respectively. The p-value of all the independent variables is below 0.05 which implies all have a significant relationship with the dependent variable (the effectiveness of M&E system).

Based on these results, the regression equation that predicts the M&E practice based on the linear combination of for stakeholder participations, competence of the staff handling,

organizational leadership, budgetary allocation, and technology utilization/ development is as follows:

4.6.2.2 The Regression Equation of effective M&E practice

$$Y = 1.168 + 0.163\ X_1 + 0.783\ X_2 + 0.307\ X_3 + 0.148\ X_4 - 0.428\ X_5 + e$$

Where   **Y** = Effectiveness of M&E system

X1 = Stakeholder Participations to M&E

X2 = Competence of the staff handling to M&E

X3 = Organizational Leadership to M&E

X4 = Budgetary allocation to M&E

X5 = Technology utilization/ development to M&E

e = sampling error

The standardize beta value indicates how many standard deviations the outcome changed as a result of a one standard deviation change in the predictor.

The standard deviation units are directly comparable; therefore, they provide a better insight in to the importance of a predictor in the model. The large the value of beta coefficient in an independent variable means the more important determinant the variable is in predicting the dependent variable. The standardize beta value for stakeholder participation is .163. This implies that, this variable has relatively strong degree of importance for analyzing the effect M&E factors on the effectiveness of its practice, followed by competence of staff handling, organizational leadership, budget allocations and technology development & utilization variable whose beta value equals 0.783, 0.307, 0.148 and -0.428, respectively. When you look at the above table, variables with higher beta values have higher level of significance so that they can contribute a lot in explaining the dependent variable. Also, variables with a lower beta coefficient have a lesser level of significance and cannot contribute a lot in explaining the dependent variable, the negative sign is indicate inverse cause & effect/relationships.

CHAPTER FIVE: SUMMARY OF KEY FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This last chapter of the research paper incorporates the three parts of the study in which the summary of major findings, conclusions and recommendation of the study. explaining about the first part discussion about the summary of major findings of the study conducted, and then conclusions and recommendation of the study presented as closing, which is then followed by further research for the study which has been useful for next research fellows.

5.2 Summary of the Findings

Throughout the research process, the research study investigated factors that affect the effectiveness of monitoring and evaluations practices of government development projects; in the cases of National Biogas Program of Ethiopia, exemplified the relationship that exists between the effectiveness of monitoring & evaluations practices, with stakeholder participations, competence of the staff handling, organizational leadership, budgetary allocation, and technology utilization/ development to M&E systems. All these factors are analyzed the effectiveness of monitoring & evaluations practices with the intent of knowing the strength of the relationship of the factors in this particular case. So as to achieve the stated objectives, quantitative approach, correlation and regression analysis were used based on the data collected from the employees of the company.

From the demographic characteristics of respondents", the lion share is taken by (84.2%) was male and the remaining (10.5%) were female respondents. Besides, the large number of respondents who participated in the study survey were from senior officers in which they are from private sector developer, general support officer, finance officer, promotion/value chain officer and from engineer & technicians which are 28 and 31 respondents respectively, together become 77.6%.

In relation to their qualification level, the respondents had almost equal amount of BSc/BA and MSc/MA degree holder, 48.7% and 46.1% respectively which shows the organization are with educated employees. Finally, when study came to the work experience of the respondents, they had adequate exposure to the work area almost more than average of employees have 7 − 10 years of experiences, 35.5% of employees has 11 − 15 years of

experiences which have a huge potential of bringing change to the organizations which reasonably increase the validity/quality of the research and effectiveness of monitoring and evaluations practices.

The analysis result depicts that the average mean score values of factors affecting the M&E practice such as stakeholder participations, competence of the staff handling, organizational leadership, budgetary allocation and technology utilization/ development to M&E (M= 3.49, M=2.8, M=2.97, M=2.68 and M=3.55 respectively) were around & above the average mean value.

The result of correlation analysis depicts that Competence of the staff handling to M&E of is another factors, it is positively and strongly related with effectiveness of M&E practice at (r=.0.958, p<0.1), organizational leadership has positively and moderately correlated with Effectiveness of M&E system at (r=0.916, p<0.1). The result agreed with the finding of (Tracey and Tan 2001), According to the study technology utilization/ development has a major impact on effectiveness of M&E system of an organization. decisions are taken by the project manager/coordinators considerably affect the effectiveness of M&E system in the organizations (Tengan et al., 2021).

Competence of the staff handling to M&E of is another factor, it is positively and strongly related with effectiveness of M&E practice at (r=.0.958, p<0.1), The result agreed (Janda and Seshadri,2001) the relationship between competence of the staff handling builds up and lead to improved effectiveness of M&E practice. The technology utilization/development and budgetary allowance a substantial influence on its overall effectiveness of M&E practice. The study discovered that staff competence has a significant impact on the effectiveness of M&E projects in their offices. As a result, the staff's competency/expertise is critical in determining the accuracy, time required to complete a task, and accountability.

The finding also shows that stakeholder participation has also positively and strongly correlated with effectiveness of M&E practice at (r=0.676, p<0.1). This finding agreed with a systematic practice for creation, execution and analysis of effective Monitoring & effective system and maximizes organization implementation of project scope with the intended cost and schedule in the organizations. According to Costello (2008), organizations with effective M&E Practice can implement the objective of the project scopes with cost and schedule because things well known where does to go and simple to track its progress, thus such factors can play a great role to the effectiveness of M&E Practice in the organizations.

The findings revealed that the effectiveness of M&E by government development organizations can be achieved only if all stakeholders actively participate and contractors are involved in the respective projects during M&E. The study also discovered that active community participation in M&E activities leads to effective M&E. Stakeholder participation ensures people's decision-making processes and governments' decision-making capacity at various levels. Lemos (2000) also demonstrated that stakeholders can contribute to the specification and selection of appropriate indicators, as well as authentication, triangulation, and measurement.

The study discovered that budgetary allocation has a significant impact on the effectiveness of project M&E. The study also discovered that the project budget should include a clear and adequate provision for monitoring and evaluation events, and that the monitoring and evaluation budget can be delineated within the overall project budget to give the monitoring and evaluation function the credit it deserves. As a result, a good M&E budget should estimate the costs, personnel, and other resources required for M&E work. Technology development and utilization affects the effectiveness of project M&E on the measures of monitoring and evaluation, accurate M&E reports, and report utilization. Verifiable indicators and traceable progress were found to have significantly improved.

Finally, the value of regression analysis shows that competence of the staff handling and technology utilization/development have statistically significant effect on the Effectiveness of M&E system of the organization, other factors like stakeholder participations, organizational leadership and budgetary allocation have moderate significant effect on the Effectiveness of M&E system of the organization. The study finding shows that 43.0 % of variance in dependent variable (the effectiveness of M&E practice) is explained by the independent variable. The results of regression analysis depict also that technology utilization/development has strong degree of analyzing the effectiveness of M&E practice followed by competence of the staff handling and stakeholder participations. In summary, the study discovered that stakeholder participation, competency of staff handling, organizational leadership, budgetary allocation, and technology development & utilization have positive and significant impact on the effectiveness of the M&E system in NBPE.

Generally, staff competency and organizational leadership had the greatest impact on the effectiveness of NBPE M&E practice for government development organizations, followed by stakeholder participation and technology development and utilization.

5.3 Conclusions

Under this study five research questions were developed and addressed in this research. The first research objective of the study was to examine the factors affecting the effectiveness of M&E system which are stakeholder participations, competence of the staff handling, organizational Leadership, budgetary allocation and technology utilization/ development of NBPE, from the finding the study can conclude that stakeholder participation, competence of the staff handling, organizational leadership and technology utilization/development have significant effect on the effectiveness of M&E system of NBPE, and also budgetary allocations have slightly effect on the M&E system.

The study revealed from the coefficient of correlation analysis competence of the staff handling, organizational Leadership, budgetary allocation and technology utilization/ development have a positive and significant effect on the effectiveness of M&E system of NBPE.

Based on the indication of variables in regression analysis, it can be possible to conclude that the four factors; stakeholder participations, competence of the staff handling, organizational Leadership and budgetary allocation have a significant effect on effectiveness of M&E system and technology utilization/ development has negative significant effect on effectiveness of M&E system.

The study also concludes that stakeholder participation and technology utilization and development have a significant impact on project M&E effectiveness, and that organizational leadership and staff handling competence have a significant impact on project M&E effectiveness.

The study also concludes that a good M&E budget estimating the costs, staff, and other resources required for M&E work is required in order to successfully complete effective M&E projects. The study also concludes that in order to give the monitoring and evaluation function the credit it deserves in project management, the project budget should include a clear and adequate provision for monitoring and evaluation events.

5.4 Recommendation

The research study established that stakeholder participations, organizational leadership, competence of the staff handling and technology utilization/ development variables have a great influence over the effectiveness of M&E practise others budgetary allocation variable slightly influence effective M&E. As a result of these findings, management should channel more effort in ensuring that the technical capacity among experts is improved, also stakeholder participation and good higher leadership should be there and investment is also made in the field of technology adoption.

Regular capacity-building trainings should be conducted to provide practitioners with up-to-date information on the practice. There is also a need to engage practitioners, particularly from the M&E field and/or related disciplines, as this has improve professionalism in the execution of roles and functions. Budgetary allocation should also be sufficient to cover the acquisition and adoption of new technologies for practice, as well as utilization for on-the-job trainings. Diversification of technologies is also required because it has usher in digital integration, in which different technologies used to complement each other, increasing efficacy and enriching data for varied uses, including decision-making responsibilities.

The study also discovered that stakeholder participation, organizational leadership and technology development & Utilization have significant impact on the effectiveness of project M&E. As a result, it is recommended that all stakeholders actively participate in M&E activities for projects funded by the central government in order to achieve effectiveness. The development organization should also schedule time for all stakeholders to participate in M&E activities to ensure that people decision-making processes and government decision-making capacity at various levels are achieved.

According to the study, when recruiting monitoring and evaluation officers, their competencies should be based on accuracy levels, time required to complete a task, monitoring and evaluation knowledge, and accountability and responsibility. According to the study, the project budget should include a clear and adequate provision for monitoring and evaluation events. The budget should also account for unforeseen and fluctuating material costs. Finally, the study suggests it should be part of the organization's human resource development policy to orient and train middle management for M&E functions, as well as rotate them into different jobs.

5.5 Further Research for the study

The study suggests that a similar study be conducted on other government development organizations to see if the results are similar. This study looked at stakeholder participation, staff handling competence, organizational leadership, budgetary allocation, and technology utilization/development as a group and how they influenced effective M&E.

1. Additional research could be conducted to look into other strategic factors not covered in this study, such as finance, good governance, and the HR system. This study could be replicated in different government projects to establish the same while using a different research design, instruments, and analysis techniques.

2. The following research topics are suggested for future study: The impact assessment of M&E practices for project sustainability and carbon financing if the project is green initiatives, as well as the impact of monitoring and evaluation systems on project or program M&E practice.

3. Future studies should include an assessment of the barriers to M&E practice in development organizations. This study is significant because it assists an organization in identifying areas of the system that need to be polished in order to improve M&E effectiveness.

4. Similar studies would be interesting for future researchers to conduct. Other researchers could look at how to improve the effectiveness of monitoring and evaluating government projects, particularly how to ensure citizens benefit from the project's output through sustainability.

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APPENDIXS
Appendix A: Questionnaire

St. Mary's University School of Graduate Studies

Department of Project Management

Dear participants:

First of all, I would like to thank you for your willingness to respond to my questions. My name is Abiy Girma, a master's degree student at the St. Mary's University School of Graduate Studies in the Department of Project Management. To complete my master's degree, I'm conducting research titled **"Assessment of factors that affects the effectiveness of monitoring and evaluations practices of government development projects of the case of national biogas program of Ethiopia**.

I kindly request you to participate in this research study by completing the attached questionnaire. As well I sincerely request you to respond to the questions as honestly as possible and return the completed questionnaires.

Knowing that your time is available please, please take few minutes of your time to complete the questionnaire. The questioner has close-ended please read each statement carefully and show the extent of your agreement on the statements by putting "√" or "X" mark in the boxes which most accurately reflects your opinion. Please answer all the questions. There is no right or wrong answer. Assure you that all response will be used only as an input for this study.

I thank you very much advance for your precious time.

Regards,

Name: Abiy Girma Abebe

Email address: abiyblue16@gmail.com

 Cell Phone: +251911113723

SECTION A: GENERAL INFORMATION

1.1.Gender

Male ☐   Female ☐

1.2. Age

20- 30 years ☐   31- 40 years ☐   41- 50 years ☐

Above 51 years ☐

1.3. Education Background

Certificate ☐

Diploma ☐

BA/BSC Degree ☐

MSc/MA ☐

1.4. Responsibility & Delegation

Manager/Coordinator ☐   Engineer/Technician

☐

M&E Officer ☐   Senior Officer

☐

1.5. How many years have you been employed in NBPE?

Below 3 years ☐   4 - 6 years ☐   7 - 10 years ☐

11 – 15 years ☐   Above 15 ☐

Date: _____

GENERAL DIRECTIONS

Please indicate by circling in any of the columns provided, your degree of agreement or disagreement with the statements listed below. The indicators are:

Strongly Agree (SA)	Agree (A)	Neutral (N)	Disagree (D)	Strongly Disagree (SD)
5	4	3	2	1

SECTION B: STAKEHOLDER PARTICIPATIONS TO M&E - SHPS

1. Indicate to what extent you agree with the following statements on the impact stakeholder participations to the effectiveness on M&E Systems.

No.	Measurement Item	Score				
	Stakeholder Participations	SA	A	N	D	SD
SHPS - 1	Stakeholders are important					
SHPS - 2	How participatory they are					
SHPS - 3	Inputs from them is vital					
SHPS - 4	Engagement during the M&E practice					
SHPS - 5	Their role the project implementation and M&E system					

Additional comment on your answers

SECTION C: COMPETENCE OF THE STAFF HANDLING TO M&E - CSHME

1. Indicate to what extent you agree with the following statements on the impact of competence of the staff handling to the effectiveness on M&E Systems.

No.	Measurement Item	Score				
	Competence of the staff handling to M&E	SA	A	N	D	SD
CSHME - 1	Relevant field of specialization is vital in M&E practice					
CSHME - 2	Level of education attained is a factor in implementation of M&E					
CSHME - 3	On-job trainings are key in improving M&E skills					
CSHME - 4	Capacity building of M&E practitioners is undertaken regularly					
CSHME - 5	Budget is allocated for capacity building trainings					
CSHME - 6	Usefulness and Relevance of the trainings					

Additional comment on your answers

SECTION D: ORGANIZATIONAL LEADERSHIP OF M&E - OLSME

1. Indicate to what extent you agree with the following statements on the impact of organizational leadership to the effectiveness on M&E Systems.

No.	Measurement Item	Score				
	Organizational Leadership	SA	A	N	D	SD
OLSME - 1	Comprehension of the M&E system in place is vital					
OLSME - 2	Assessment of the M&E and giving detailed information and insights on M&E practice					
OLSME - 3	Strengthening the existing M&E					
OLSME - 4	Learning opportunities are derived from previous assignments					
OLSME - 5	Management is enough to follow M&E system					
OLSME - 6	Professionalism is essential in undertaking of M&E function					
OLSME - 7	Development of quality M&E reports					

Additional comment on your answers

SECTION E: BUDGETARY ALLOCATIONS TO M&E - BALME

1. Indicate to what extent you agree with the following statements on the impact of budgetary allocations to the effectiveness on M&E Systems.

No.	Measurement Item	Score				
	Budgetary Allocations	SA	A	N	D	SD
BALME - 1	Any budget for implementation of M&E					
BALME - 2	Budget is allocated for the M&E system					
BALME - 3	Assessment of the M&E System is undertaken regularly budget					
BALME - 4	Learning opportunities are derived by frequent budget					
BALME - 5	Any budget for management utilizes M&E derived data in decision-making					

Additional comment on your answers

SECTION F: TECHNOLOGY UTILIZATION/DEVELOPMENT TO M&E - TUDME

1. Indicate to what extent you are in agreement with the following statements on the impact of technology to the effectiveness on M&E Systems.

No.	Measurement Item	Score				
	Technology	SA	A	N	D	SD
TUDME- 1	Current technologies have been adopted in M&E practice					
TUDME- 2	Digital integration has been widely adopted in M&E practice					
TUDME- 3	Technology adopted has helped achieve cost reduction					
TUDME- 4	Technology adopted has improved accuracy of data obtained					
TUDME- 5	Technology adopted is responsible for better data quality					
TUDME- 6	Technology adopted is determined by cost implication					

Additional comment on your answers

SECTION G: EFFECTIVE M&E SYSTEM - EMES

1. Indicate to what extent you are in agreement with the availability of the following indicator statements provided on effective M&E System in government organizations.

No.	Measurement Item	Score				
	Effective M&E System	**SA**	**A**	**N**	**D**	**SD**
EMES - 1	Well-formulated M&E policy and budget component is available					
EMES - 2	Well-designed M&E framework is set					
EMES - 3	Well established CIMES structures are set					
EMES - 4	Well-defined Integrated Development Program reporting indicators handbook is available					
EMES - 5	Well established M&E champion is available					
EMES - 6	Well-designed M&E communication strategy is available					

CIMES: County Integrated Monitoring & Evaluation System

Additional inputs

Appendix B: SPSS Output

Statistics

		Gender of Respondent	Age of Respondent	Educational Qualification of Respondent	Responsibility/Delegation of Respondent	Experience of Respondent
N	Valid	72	72	72	72	72
	Missing	4	4	4	4	4

Demographic Analysis of Respondents

Gender of Respondent

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	64	84.2	88.9	88.9
	Female	8	10.5	11.1	100.0
	Total	72	94.7	100.0	
Missing	System	4	5.3		
Total		76	100.0		

Age of Respondent

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	31 - 40 years	27	35.5	37.5	37.5
	41 - 50 years	39	51.3	54.2	91.7
	above 51 years	6	7.9	8.3	100.0
	Total	72	94.7	100.0	
Missing	System	4	5.3		
Total		76	100.0		

74

Educational Qualification of Respondent

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	BA/BSC Degree	37	48.7	51.4	51.4
	MSc/MA	35	46.1	48.6	100.0
	Total	72	94.7	100.0	
Missing	System	4	5.3		
Total		76	100.0		

Experience of Respondent

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	7 - 10 Years	41	53.9	56.9	56.9
	11 - 15 Years	27	35.5	37.5	94.4
	Above 15 Years	4	5.3	5.6	100.0
	Total	72	94.7	100.0	
Missing	System	4	5.3		
Total		76	100.0		

Reliability Test Result for both Dependent & Independent Variables

Case Processing Summary

		N	%
Cases	Valid	72	94.7
	Excluded	4	5.3
	Total	76	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.943	35

Descriptive Analysis of Variables

Descriptive Statistics

	N	Mean	Std. Deviation
SHPS	72	3.4899	.23048
CSHME	72	2.7912	.49890
OLSME	72	2.9716	.36245
BALME	72	2.6840	.46981
TUDME	72	3.5502	.26325
Valid N (listwise)	72		

Correlations Analysis

Correlations

		SHPS	CSHME	OLSME	BALME	TUDME	EMES
SHPS	Pearson Correlation	1	.720**	.730**	.736**	.896**	.676**
	Sig. (2-tailed)		.000	.000	.000	.000	.000
	N	72	72	72	72	72	72
CSHME	Pearson Correlation	.720**	1	.939**	.831**	.825**	.958**
	Sig. (2-tailed)	.000		.000	.000	.000	.000
	N	72	72	72	72	72	72
OLSME	Pearson Correlation	.730**	.939**	1	.757**	.834**	.916**
	Sig. (2-tailed)	.000	.000		.000	.000	.000
	N	72	72	72	72	72	72
BALME	Pearson Correlation	.736**	.831**	.757**	1	.700**	.851**
	Sig. (2-tailed)	.000	.000	.000		.000	.000
	N	72	72	72	72	72	72
TUDME	Pearson Correlation	.896**	.825**	.834**	.700**	1	.723**
	Sig. (2-tailed)	.000	.000	.000	.000		.000
	N	72	72	72	72	72	72
EMES	Pearson Correlation	.676**	.958**	.916**	.851**	.723**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	
	N	72	72	72	72	72	72

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

Regression Analysis

Multicollinearity

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	1.168	.181		6.464	.000	.807	1.529		
	SHPS	.276	.112	.163	2.464	.016	.052	.499	.146	6.836
	CSHME	.613	.073	.783	8.441	.000	.468	.758	.074	13.484
	OLSME	.331	.084	.307	3.923	.000	.163	.499	.104	9.605
	BALME	.123	.044	.148	2.775	.007	.034	.211	.225	4.448
	TUDME	-.635	.113	-.428	-5.607	.000	-.861	-.409	.109	9.134

a. Dependent Variable: EMES

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.979[a]	.958	.955	.08312	.958	300.267	5	66	.000	1.113

a. Predictors: (Constant), TUDME, BALME, OLSME, SHPS, CSHME

b. Dependent Variable: EMES

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	10.374	5	2.075	300.267	.000[b]
	Residual	.456	66	.007		
	Total	10.830	71			

a. Dependent Variable: EMES

b. Predictors: (Constant), TUDME, BALME, OLSME, SHPS, CSHME

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.168	.181		6.464	.000
	SHPS	.276	.112	.163	2.464	.016
	CSHME	.613	.073	.783	8.441	.000
	OLSME	.331	.084	.307	3.923	.000
	BALME	.123	.044	.148	2.775	.007
	TUDME	-.635	.113	-.428	-5.607	.000

a. Dependent Variable: EMES

Scatterplot

Dependent Variable: EMES
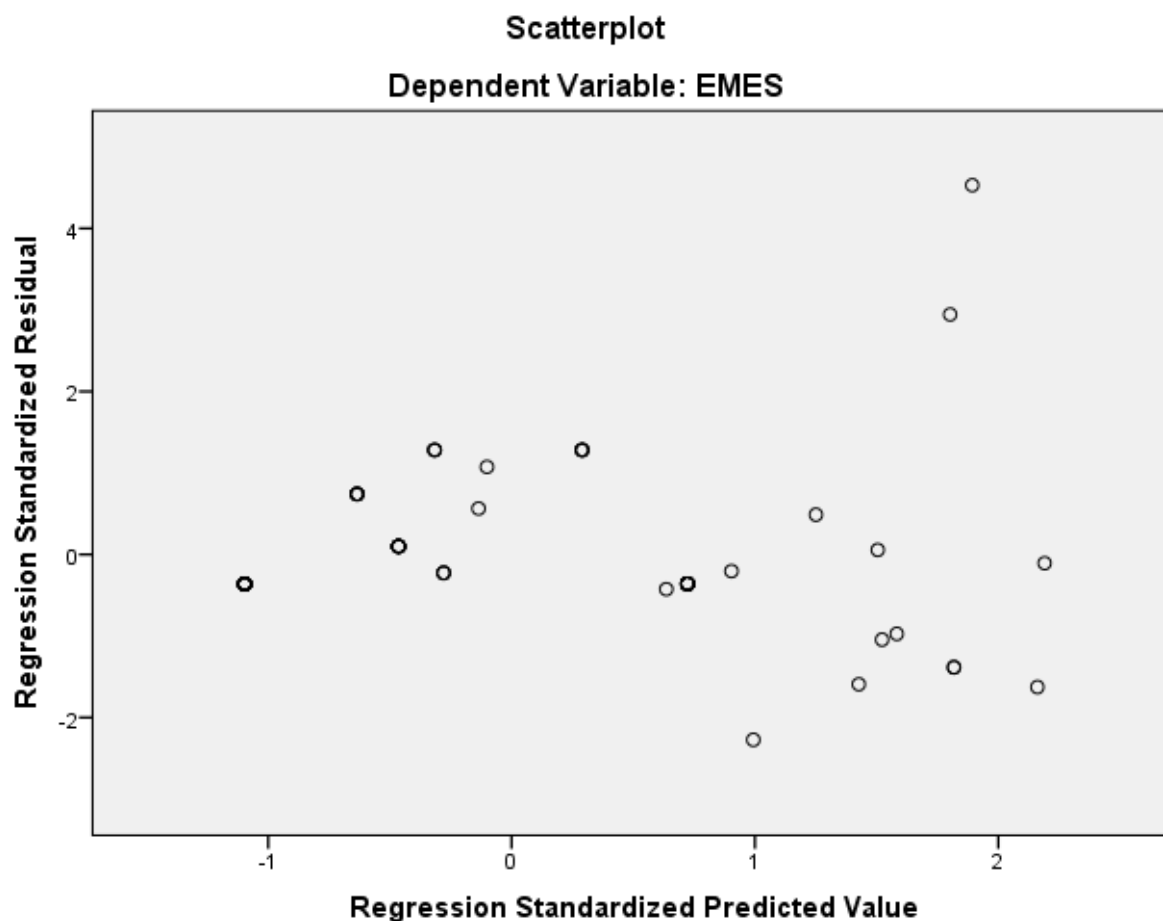
Appendix C: Yearly Constructed Biogas by NBPE, Annual M&E Department Output

Number of yearly constructed biogas by NBPE

Year	Oromia	Amhara	SNNP	Tigray	Total	Plan	Achievement In %
2008 GC	23	25	25	25	**98**	100	98%
2009 GC	16	7	4	3	**30**	400	8%
2010 GC	291	117	147	176	**731**	1,200	61%
2011 GC	531	331	358	423	**1,643**	2,800	59%
2012 GC	709	752	510	538	**2,509**	3,500	60%
2013 GC	933	685	680	852	**3,150**	3,500	90%
2014 GC	597	551	505	864	**2,517**	3,600	70%
2015 GC	364	601	513	782	**2,260**	3,500	**65%**
2016 GC	**736**	**724**	**603**	**490**	2553	3340	**76%**
					15,491		

Yearly constructed biogas by NBPE I and NBPE II

	NBPE I						NBPE II					
Region	2009	2010	2011	2012	2013	S.total	2014	2015	2016	2017	2018	S.total
Amhara	32	117	331	752	685	**1,917**	551	601	724	1,122	1,475	**4,473**
Oromia	39	291	531	709	933	**2,503**	597	364	736	672	576	**2,945**
SNNPR	29	147	358	510	680	**1,724**	505	513	603	451	236	**2,308**
Tigray	28	176	423	538	852	**2,017**	864	782	490	346	330	**2,812**
Total	**128**	**731**	**1,643**	**2,509**	**3,150**	**8,161**	**2,517**	**2,260**	**2,553**	**2,591**	**2,617**	**12,538**

Domestic Bio-digester Market Development under NBPE+ (2016-2022)

No.	Region	Year I	Year II	Year III	Year IV	Year V	Year VI	Total
1	Amhara	170	255	1,202	1,803	2,704	1,169	7,303
2	Oromia	210	315	1,485	2,227	3,341	1,449	9,027
3	SNNPR	140	210	990	1,485	2,227	959	6,011
4	Tigray			990	1,485	2,227	959	5,661
								-
5	Afar	160	240	360	540	810	352	2,462
6	B/Gumuz	140	210	315	473	709	308	2,155
7	Gambella	60	90	135	203	304	130	922
8	Somali	160	240	360	540	810	352	2,462
	National (Total)	1,040	1,560	5,837	8,756	13,132	5,678	36,003

Year One		Year two		Year three		Year four		Year five		Year six		Total	
Achiev't	%	Achiev't	%	Achiev't	%	Achiev't	%	Achiev't	%	Achiev't	%	Achiev't	%
587	345%	982	123%	2,899	241%							4,468	55%
164	78%	352	101%	1,001	67%							1,517	16%
101	72%	206	82%	514	52%							821	13%
220		385	110%	761	77%							1,366	23%
-		-										-	
-	0%	10	20%	51	14%							61	2%
16	11%	27	36%	82	26%							125	6%
-	0%	3	6%	22	16%							25	3%
12	8%	38	51%	65	18%							115	5%
1,100	106%	2,003	100%	5,395	92%							8,498	22%

All three Project Yearly Report (NBPE I, NBPE II and NBPE+)

Region	NBPE I						NBPE II							NBPE+					Total
	2009	2010	2011	2012	2013	S.total	2014	2015	2016	2017	2018	2019	S.total	2017	2018	2019	2020 till sep 30	S.tootal	
Amhara	32	117	331	752	685	**1,917**	551	601	724	1122	1355	120	**4,473**	208	900	2184	2067	**5,359**	11,749
Oromia	39	291	531	709	933	**2,503**	597	364	736	672	526	50	**2,945**	84	244	666	864	**1,858**	7,306
SNNP	29	147	358	510	680	**1,724**	505	513	603	451	206	30	**2,308**	52	124	405	298	**879**	4,911
Tigray	28	176	423	538	852	**2,017**	864	782	490	346	285	45	**2,812**	54	417	590	452	**1,513**	6,342
Afar															2	19	43	**64**	64
B/Gumuz															43	32	50	**125**	125
Gambella															2	4	19	**25**	25
Somali															44	47	35	**126**	126
	128	731	1643	2509	3150	8161	2517	2260	2553	2591	2372	245	12538	398	1776	3947	3828	**9,949**	30,648