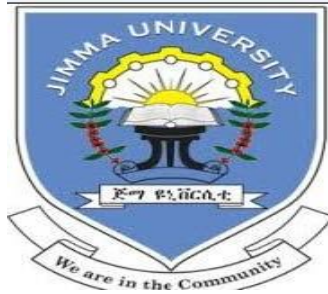# Assessment of Educational Management Information System (EMIS) Implementation in Oromia Regional State, Ethiopia

A Thesis Submitted to the Research and postgraduate Office of Jimma University in Partial Fulfillment of the Requirements for the Award of the Degree of Master of Business Administration (MBA)

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July, 2020

Addis Ababa, Ethiopia

DECLARATION

I declare that the research Report entitled "Assessment of Educational Management Information System (EMIS) Implementation in Oromia Regional State, Ethiopia" submitted to Research and Postgraduate Studies' Office of Business and Economics College is original and it has not been submitted previously in part or full to any university.

_____

Date: _____

CERTIFICATE

We certify that the Research Report entitled "<u>Assessment of Educational Management Information System (EMIS) Implementation in Oromia Regional State, Ethiopia</u>" was done by <u>Mrs. Wubnesh Mati</u> for the partial fulfilment of Master's Degree under our Supervision.

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     (Main Advisor)   (Co-Advisor)

ACKNOWLEDGEMENT

ABSTRACT

The purpose of this study was to assess the implementation of EMIS program in Oromia Regional State. The study follows descriptive design and a mixed research approach. Regarding data gathering method, the study *employs a survey method of data gathering tools like questionnaire, interview, focus group discussion, document analysis & observations. Cluster sampling and multi-stage random sampling technique was used for sampling school level population and purposive sampling techniques were used for sampling EMIS data producers (EMIS staff) and EMIS data users (stakeholders). The Total sample population selected for this research were, 380(272 school directors & 25 EMIS staff and 83 EMIS stakeholders) from a total of 908 population selected from 6 zones 12 woredas, 219 primary schools & 26 secondary schools in Oromia Regional State. For this study, primary & secondary data was collected from school principals, Woreda, zonal, regional education offices and respective Stakeholders. The frequency counts and percentages were used to analyze the background information of the respondents. Whereas the quantitative data obtained in relation to main questions of the study was analyzed by using mean scores with standard deviation. The scores of each item was statistically organized and imported into Statistical Package for Social Sciences (SPSS-20) to obtain sum, mean value and standard deviation. The finding of this study reviles that, the implementation status of enabling environment for implementation of EMIS was evaluated as an emerging stage, while system soundness, quality data and education data utilization were evaluated as Established stage and the overall status as moderate level. The main gaps identified were lack of legal- framework, lack of accountability & responsibility for data, absence of data-driven culture, shortage of modern ICT materials & infrastructures, the system is non-dynamic & not elastic, communication between data producers and data users was very limited,. The study recommends that, Oromia Education Bureau must have legal framework with a clear legal mandate to collect information from all education and training institutions and bodies. The bureau should shift data collection, data analysis& data dissemination techniques from manual to modern web-based application and online technology. The data architecture and its blue-print should be prepared and implemented in the region. The statistical report should be customized to users need and effective dissemination strategy should be designed.*

Key words: Enabling environment, System Soundness, Quality data & Data Utilization

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ACRONYMS

AAU	Addis Ababa University
ADEA	Association for Development of Education in Africa
ANOVA	Analysis of Variance
BoFEC	Bureau of Finance & Economic Cooperation
CSA	Central Statistical Agency
CTE	College of Teachers Education
EFA	Education for All
EMIS	Education Management Information System
EQUIP	Education Quality Improvement Program
ESDP	Educational Sector Development Program
FGD	Focus Group Discussion
GDP	Gross Domestic Product
HoDs	Head of Departments
ICT	Information Communication Technology
KG	Kindergarten
MIS	Management Information System
MoE	Ministry of Education
NGOs	Non-Governmental Organizations
OEB	Oromia Education Bureau
REB	Regional Education Bureau
SABER	Systems Approach for Better Education Results
SADC	The Southern African Development Community
SDG	Sustainable Development Goal
SPSS	Statistical Package for Social Science
TGE	Transitional Government of Ethiopia
UNESCO	United Nations Education Science and Culture Organization
UNICEF	United Nations Children's Fund)
WEO	Woreda Education Office.
ZEO	Zone Education Office

CHAPTER ONE

1. INTRODUCTION

This chapter begins with a brief background of the study followed by statements of the problem, the objectives; significance, Scope of the study, definition of key terms as well as organization of the study.

1.1 Background of the Study

EMIS is an institutional service unit producing, managing, and disseminating educational data and information, usually within a national Ministry or Department of Education. The management functions of EMIS include collecting, storing, integrating, processing, organizing, outputting, and marketing educational data and statistics in a timely and reliable fashion (Hua & Heristein, 2003). According to (Abdul-Hamid, 2014) "EMIS is a necessary element of an education system that enables policy makers to make critical modifications to the system in order to improve the quality of education". (UNESCO, 2018) recently defines EMIS as: Ensemble of operational processes, increasingly supported by digital technology, that enable the collection, aggregation, analysis, and use of data and information in education, including for management and administration, planning, policy formulation, and monitoring and evaluation.

EMIS helps to streamline the flow of information, eliminate duplication of information for decision making, provide information for policy dialogue and facilitate the use of relevant information in decision making by planners at all levels According to (UNESCO, 2010), school data can also be used in financial planning, improving exam performance, instilling discipline, nurturing the student talents, comparison to other schools, reporting to authorities, minimizing the wastage of students as well as making the school projections. Well-functioning EMIS can ensure achievement of national goals to provide quality education, which is the basis for facilitating economic growth and sustainable development. (Luena, 2012)

Many countries around the world have spent significant resources but still struggle to accomplish a functioning EMIS. On the other hand, countries that have created successful systems are harnessing the power of data to improve education outcomes (Abdul-Hamid, 2017). As Tegegn (2003) An effective EMIS should consists a life cycle of data collection, data processing, data analysis, publication & feed-back.

Although there had been some statistical reports before, Ethiopia's effort to establish modern education management information system started at the end of the 1980 by the name "Education Information System Project" with the assistance from SIDA. Since 1991, EMIS in Ethiopia is managed by a body called the Federal EMIS Panel under planning department and has the mandate of preparing questionnaires, consolidating regional data, preparing and publishing annual abstracts of the country and developing software for data management. (MOE,2012). On the other hand, Oromia Education Bureau EMIS Panel is involved in data capturing and publishing its own annual abstracts. and provide data for the Federal EMIS team to publish the annual abstract of the Federal Ministry of Education. Since 2004, Ethiopia implemented the computerized UIS EMIS model known as Stat.Educ2, based on the assessment of the country's education management system.

Ethiopia's Education Management Information System (EMIS) has grown in recent years. Now, EMIS is available at decentralized levels, and with support from the respective ICT directorates and offices, are collecting and processing education performance data which can be used for enhanced service delivery (MoE, National Education Management Information Systems Module, 2012). This created favorable conditions for EMIS process at all levels of education system and at federal level it's structure was shift to ICT & EMIS Directorate in the year 2015. More authority and responsibility were given to regional education bureaus, woredas and schools, which is under implementation in Oromia education system as well. Recently, in 2019 Oromia Regional State, ICT & EMIS team are integrated as one directorate and responsible for EMIS activities such as collecting & analyzing data, writing the report, publish annual education abstracts and disseminate to all stakeholders.

1.2. Statement of the problem

The use of information technology in educational management has rapidly increased due to its efficiency and effectiveness. In the initial stages of its development, management information systems (MIS) main purpose and usage was to improve the efficiency of school office activities. The most concern was being focused on data entry and collation, rather than upon data transfer or analysis (Madiha S. 2014). According to (World Bank, 2015) Common EMIS challenges revolve around deficiencies in three critical areas: sustainability, accountability, and efficiency. Most countries with an EMIS struggle with sustainability issues, such as: incompatibility with existing systems, poor customization of new systems, staff capacity issues, limited financial resources, or limited government commitment. As (Ellison, 2004), EMISs in many developing countries can still be described as poor. Data dissemination is slow, some data are unreliable, the analysis of information and its input to developing better education policies are limited. With some exceptions, EMISs in most developing countries can be described as poor in terms of timeliness and data quality. Furthermore, he concludes that Poor EMISs cause that can hamper all those seeking to manage and develop national education systems in the country concerned, and they hinder international efforts to track global progress towards education development - notably Education for All (EFA) - and to organize support for it.

According to the assessment recently conducted by the World Bank four main challenges for EMIS implementation are identified. These are, Leadership challenges, data challenges, operational challenges and system & technological challenges (Abdul-Hammid, 2017). EMIS are the tools countries use to gather, process and interpret data. For the past several decades, these systems have grown in complexity to give policy-makers and classroom teachers alike a view of whether learners, schools, and national education plans are progressing in relation to different objectives. The systems underlie education reforms and form the backbone of monitoring and evaluation efforts (UNESCO, 2018). Further it indicates that, SDG 4 is a reason and cause to re-examine the types of data used by EMIS and to re-assess if these data correspond adequately with the needs of the range of users, whether from local, national, regional, or international perspectives. Some study conducted in Ethiopia secondary schools shows the resent problems related to the implementation of EMIS.

As per (Tesfaye,2016) Lack of ICT materials, trained man power, data management system& poor design of data tools were main challenges. In addition the finding of a research conducted by (Betiglu,2016) in Addis Ababa shows that, there was no well-established EMIS structure, organization and resource in place at all levels of education system, education data/ information were not organized systematically, there was high turnover in the positions of EMIS, there was no accountability for inaccuracy, unreliable, irrelevant, incomplete, and not valid data transfer. Similarly, the finding of another study conducted by (German, 2015) in Oromia Regional state Arsi zone indicates poor design of data instrument, poor data management system, shortage of ICT materials, unqualified manpower, turnover of leadership, and employee readiness to practice of EMIS as needed.

Even though some studies regarding EMIS were conducted worldwide & in our country still there is a gap related to the scope of area coverage & contents of the study. This study also tends to address some of the major gaps. Specially, Oromia regional state implements EMIS over 20 years ago but, regional level assessment of EMIS has not been done yet. Further, there is no known empirical evidence at the regional level. In addition, the contents of the earlier researches were specific to some parts of the EMIS package and specific zone, woreda & school level. But this study is conducted as regional level and more comprehensive Therefore, this study tries to investigate the current status of educational management information system in Oromia Regional State. The following basic research questions were treated in this research:

1. How enabling is the working environment for the implementation of EMIS in the region?
2. To what extent the system integration sound?
3. How is an EMIS experienced using a quality data?
4. To what extent do decision makers use EMIS data?

1.3. Objectives of the study

1.4.1 General Objectives

The main objective of the study was to assess the effectiveness of EMIS implementation in Oromia regional State.

1.4.2 Specific Objectives

The specific objectives of the study were:

- To assess the existence of enabling environment for the implementation of EMIS.
- To evaluate soundness of the system
- To examine the quality of data that EMIS uses.
- To examine the extent to which decision makers use EMIS data.

1.5. Significance of the Study

- The finding of the study helps to identify the achievement and gaps of implementation of EMIS in Education sector of the region.
- The finding of the study is used for a region as a benchmark for EMIS. Since it identifies the current status of implementation stages and the holistic picture of the system, it can be used to measure progress. This will help future researchers and the education bureau itself for developmental plans of education sector and performance evaluation both in the strategic multiyear plan and annual ones.
- The finding provides good information for education sector management and other decision makers for monitoring ESDP & SDG goals and planning for the future.
- The document is good resource for donors & other interested bodies who want to invest on EMIS.
- It may encourage succeeding researchers for further investigation and will fill the current gaps in practical literature in the field of study.

1.6. Scope of the study

Scope of this research was Limited to Oromia Regional State and it's contents were limited to analyzing the effectiveness of the EMIS implantation for assessing how much EMIS is proven as effective and useful in policy implementation. This research does not focus on particular software level design faults and testing the functionality of EMIS software at the technical level of correctness. Also, this research does not focus on the time varying effects of the EMIS process as the cross-sectional research methodology shall be used for obtaining the data on a particular time interval. It only includes primary and secondary school data and not includes CTE, KG schools and alternative basic education data.

1.7. Definition of Key Terms

Advanced EMIS: Refers to the last (4th) stage of the implementation status of EMIS in which comprehensive enabling environment exists, the process is fully integrated, modern mechanism of data collection and production of quality, accurate & reliable data exist and the finding is wholly utilized by users for decision making.

Data: refers to unprocessed facts, figures, symbols, events.

Data Utilization: Refers to the status of stakeholders using education data for operational work, Accessibility of the data, openness of a data for users & effectiveness in strategy of data dissemination,

Data- Driven culture: Refers to efforts by the government to promote the collection and utilization of data within and beyond the education system

Data Architecture: Is the set of specifications and processes that prescribe how data is stored in and accessed from a database and contains a wireframe ("blueprint" of the architecture) that highlights the sequences and connected relationships among the different indicators in the data.

Dynamic System: Is the system that is elastic and easily adaptable to allow for changes to provide solutions to emerging needs including advances in technology.

Education Management Information System (EMIS): is a data system that collects, monitors, manages, analyzes, and disseminates information about education inputs, processes, and outcomes—in particular student learning.

Emerging EMIS: Refers to the 2nd stage in the implementation status of EMIS in which basic enabling environment exists, basic process, structure, basic mechanism of data collection, & production of quality data exists and the finding is used by some users but not utilized for major policy decisions.

Established EMIS: Refers to the 3rd stage in the implementation status of EMIS in which most components of enabling environment exist, some process is structured but not fully integrate, most mechanism of data collection & production of quality data exist & the finding is used by most users but not fully operational in decisions making.

Enabling environment: Refers to the existence of policies, sustainable infrastructure, human & financial resources that can support data collection, management, use and access possible.

Integrity: Integrity in educational data refers to the extent to which educational statistics and their reports reflect the values, beliefs, and principles that the government claims to uphold:

Latent EMIS: Refers to the 1st stage in the implementation status of EMIS which lacks comprehensive enabling environment, process, structure and mechanisms of producing quality data. Generally, it can be seen as very poor & nonfunctional.

Methodological soundness. Is refer to production of educational statistics from raw data that follow internationally and nationally accepted standards, guidelines, and good practices.

Primary education: Is a school level of (1-8) grade

Quality Data: refers to the processes of collecting, saving, producing, and utilizing information ensures accuracy; security; and high–quality, timely, and reliable information.

System Soundness: Is the processes, structures, and integration capabilities that bring data together within the data system

Secondary school: Is a school level of (Grade 9-12) grade.

Serviceability: Serviceability in EMIS refers to the service of clients by ensuring the relevance, consistency, usefulness, and timeliness of statistical data.

1.8. Organization of the Paper

The paper was organized in fiver chapters. Chapter one consists of background of the study, Statement of problems, Organizational background, objectives of the research Significance of the study, Scope and Limitation of the study. Chapter 2 includes theoretical and empirical literature review. On the other hand, chapter three consists research Design and Methodology with sub topics of Research Design, Sources of Data & Data, Collection Techniques, Target Population & Sampling Methods and Method of Data Analysis & Presentation. Chapter four focuses on presenting analysis and interpretation of data while the summary of major findings, conclusions and recommendations was discussed under the fifth chapter.

CHAPTER TWO

2. LITERATURE REVIEW

Introduction

This chapter presents theoretical and empirical related literatures. The theoretical part focuses on Concepts Management Information System (MIS) & Education Management Information System (EMIS), Significance of Education data, a successful and Effective Education Management Information System and description of EMIS as case of Ethiopia. On the other hand, the empirical literatures review emphases on assessment of components and Key EMIS assessment standards of EMIS. Moreover, the operational framework and conceptual framework of the study were included.

2.1. Theoretical Review

2.1.1. Concepts of Education Management Information System

Different scholars define Education Management Information System in different aspects for instant, (Hua & Heristein, 2003), describe EMIS as "an institutional service unit producing, managing, and disseminating educational data and information" whose uses include "collecting, storing, integrating, processing, organizing, outputting, and An EMIS is an institutional service unit producing, managing, and disseminating educational data and information, usually within a national Ministry or Department of Education. Further, expressed the management functions of EMIS as, collecting, storing, integrating, processing, organizing, outputting, and marketing educational data and statistics in a timely and reliable fashion. According to (Abdul-Hammid, 2017). An Education Management Information System (EMIS), in its simplest form, can be defined as a system responsible for collection, maintenance, analysis, dissemination, and utilization of data in an education system,

The objectives of an EMIS are: to improve the capacity for data processing, storage, analysis and providing education planners with timely data; to facilitate the use of relevant information in decision making by planners at all levels; to eliminate duplication of information for decision making; to streamline the flow of information; and to provide information for policy dialogue (Mohammed, Kadir, May-Lin, Rahman, & Arshad, 2009).

The basis of an EMIS should be school and student data because those data link measures of education inputs to outputs, particularly learning, from which important education analysis and conclusions can be derived According to (Abdul-Hamid, 2014 &2017). complete EMIS includes data on enrollments, attendance, graduation rates, learning assessments, student health, and administrative statistics. In addition, student demographics, teachers, support services, and the learning materials and environment are equally important. Furthermore, an effective EMIS provides systematic, quality, timely data, driving efficiency and evidence-based decision making. When implemented effectively.
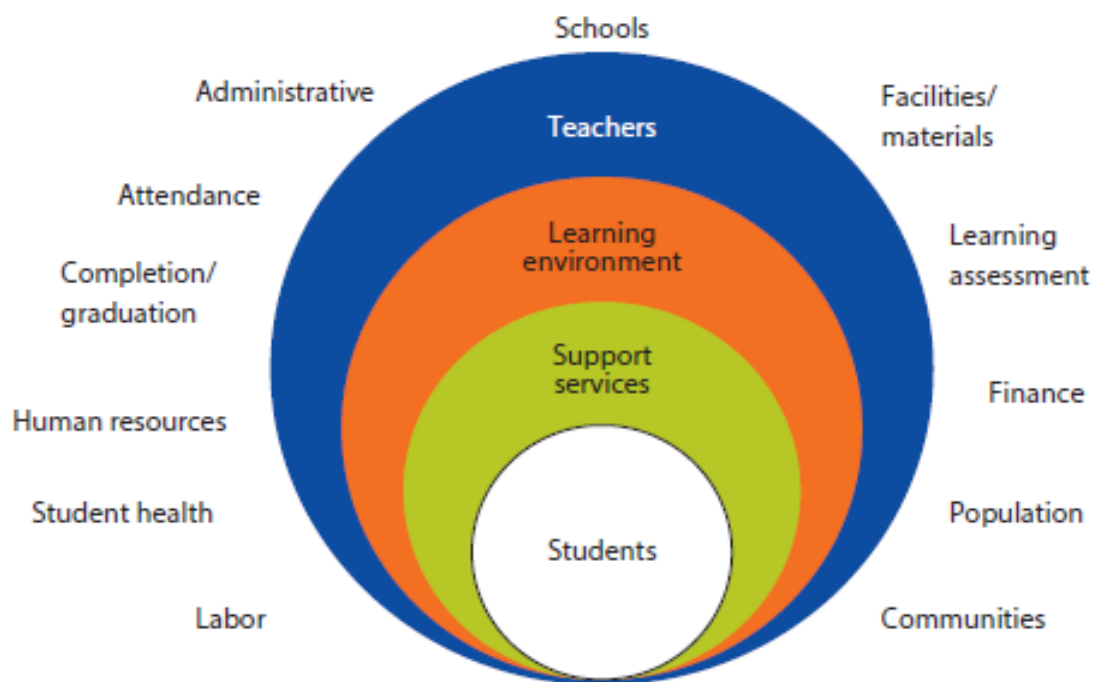
Figure 2.1. Components and Inputs of an EMIS

Source: Abdul-Hamid,.2017, World Bank

2.1.2. Significance of Education Data

The long-range vision of EMIS is to establish a demand-responsive and self-sustainable education management information system based on integration of sub-systems, participation of stakeholders and support of technically competent bodies. (Tegegn ,2003). There are three main purposes for data collection these are: policy design, monitoring implementation and evaluating outcomes (UNICEF, 2014), Different researchers describes the importance of education in different perspectives some of them are discussed below.

Education Data Improve Learning

Education data and improved learning can quantify and reap economic benefits. Research clearly shows that education has a direct impact on gross domestic product (GDP) per capita. It is estimated that a year of additional schooling in a country could lead to an increase of more than 10 percent in GDP per capita (Patrinos & Psacharopoulos, 2013); (Thomas, Milan, & Burnett, 2013). Quality of education, and its ability to produce positive learning outcomes, is a priority across global development agendas such as the Sustainable Development Goals (SDGs) and the World Bank's Learning for All Education Strategy 2020 (UNESCO, 2017). According to (UNESCO, 2010) EMIS evaluates quality of outputs and outcomes, including completion rate of a level, specific acquired knowledge, skills, values and behavior, ability to access or create jobs, participation and contribution to the society and local community and continuity in terms of learning, doing, being and living together.

Education Data Strengthen the Whole System of Education Management

A culture of data means that data are expected, valued, and used by various stakeholders across the education system. It also means that data are part of the fabric of daily operations, processes, and decision making. Specifically, data play an essential role at each step in the process, designing and evaluating policies and standards, further it helps for communicating and facilitating resource allocation, enabling active real-time use in classroom instruction, and strengthening school management and planning. (Abdul-Hammid, 2017). A functional and effective EMIS responds to the demand for the right data and data driven decisions which is constantly growing globally (World Bank,2015). Governments and international community are

monitoring progress in their efforts to achieve the EFA goals and the Sustainable Development Goals (UNESCO, 2018).

Data- driven decisions are important in efforts to improve the efficiency in an education system while accurate and reliable information is necessary to inform policy and programs in education (Hua & Heristein, 2003). EMIS provides quality and timely data, drives efficiency and supports evidence- based decision making. Without data there is wastage of education budget both in the developing and developed countries (Abdul-Hami, 2014). As he explained, in the state of Arizona (USA), it was estimated that 'ghost students' cost the state about $125 million every year (Butcher, 2012). Since education data has budget implication it needs quality data.

Data Guide Policy Makers and Ensure Efficient Resource Allocation and Management

Information-based decision making in the management of the education system as its goal increased access, efficiency, effectiveness, equity, and quality of education through effective systems of monitoring and evaluation, budgeting and planning, policy research and analysis. As (Hua & Heristein, 2003) high-quality, accurate, and useful data allow stakeholders to make informed decisions and overcome challenges, ensuring that learning stays at the forefront of the education system. According to (Makwati, Audinos, & Lairez, 2003) data help policy makers in the design and implementation of policies that are based on evidence and proven to reach intended outcomes. And the achievement of good-quality education is dependent on the quality of statistics which inform the policy formulation, educational planning, management and monitoring processes.

The production and dissemination of high-quality education statistics is essential for effective planning, as well as for monitoring progress towards national and global education targets. Yet for many of the 43 indicators under SDG 4, data are currently incomplete, which makes monitoring difficult or impossible. It can also result in poorly-designed policies, leading to inefficient use of resource (UNESCO, 2017). According to a 2016 inventory undertaken by the UNESCO Institute for Statistics (UIS), the world currently gathers only half of the data needed to monitor progress towards the Sustainable Development Goal 4 (SDG 4) targets (UNESCO, 2018).

Data Help Schools, Teachers, and the Community to Improve Learning

Data systems support school leadership, teaching, and learning and engage the community to achieve better education results. Engagement of parents and the community with schools via data supplied by an EMIS provides an opportunity to improve learning (Lepine, 2015).

2.1.3. A successful and Effective Education Management Information System (EMIS)

A successful Education Management Information System (EMIS) is supported by an enabling environment (legal framework, organizational structure, infrastructural capacity, personnel, and budget); system soundness (system architecture, dynamics, serviceability, and data coverage); quality data (methodology, accuracy, integrity, and periodicity); and data use (operational use, openness, accessibility, and data dissemination).(Abdul-Hamid H. , 2014 & 2017). A successful Education Management Information System is one that fully conforms to the component of Policy and Legal Framework, Resources Availability and Utilization, Statistical processes and Education Information Reporting (ADEA, 2009), In addition according to (UNESCO, 2017), Components of Effective EMIS categorized under three broad areas that address both the demand and the supply sides of national education information systems: the enabling environment, data production, and data dissemination and data use. Together these activities are part of the data revolution that can respond to the needs of the 2030 education agenda.

Lessons learned from EMISs in Uganda, Mali, and Zambia conclude that "creating a sustainable, workable EMIS depends on three factors: 1. The right PEOPLE, motivated to perform and skilled in their work; 2. The right PROCESSES that reduce duplication and duplication and reinforce accuracy and accountability; and 3. The right TECHNOLOGY, appropriate to the state of the country, and the reliability of its infrastructure." (Abdul-Hamid H. , 2014). Education management information systems are intended to help government experts design and implement policies. Unfortunately, most countries have not formulated policies on how to use EMIS data in planning and decision making. Even in countries where information systems are institutionalized, they are barely used to guide education policies (UNESCO 2010). Enabling environment for EMIS includes: Legal framework, Organizational structure and institutionalized processes, human resources infrastructural capacity, Budget, Data-driven culture (Abdul-Hamid, Namrata, & Mintz, 2017),

According to (ADEA, 2009). the Ministry of Education must have a clear legal mandate to collect information from all education and training institutions and bodies, Further, the ministry should give great attention to quality commitment, reporting accountability, resource allocation and utilization. Ineffective institutional frameworks, leadership and management cause inefficiencies and contribute to the deterioration of trust in products of the national statistical system (UNESCO, 2017). EMIS is internally accountable for activities such as technical data collection, data entry, data processing, producing data reports and meeting ad hoc report requests. External accountability refers to the actions that must be taken by other units on behalf of EMIS, such as budget support, policy research and analysis, and collaboration with other divisions and policy guidelines in data and information sharing (Hua & Heristein, 2003).

System soundness of EMIS includes: Data architecture, Data coverage, Data analytics, Dynamic system and Serviceability. It encompasses the processes, structures, and integration capabilities that bring data together within the data system and the data coverage indicates major types of education data, including administrative, financial, human resources, and learning outcomes. (Abdul-Hammid, 2017). Data integration is one of the most important EMIS development strategies (Hua & Heristein, 2003).
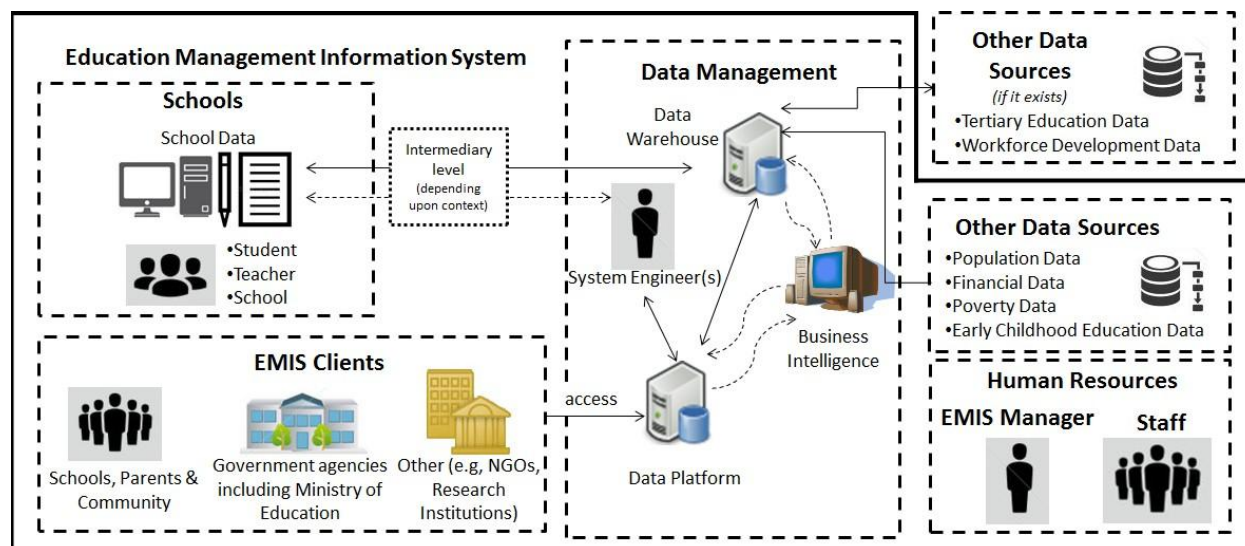
Source: Abdul-Hamid, 2014 (World bank Group).

Figure 2.2 Data Sharing and Coordination in an EMIS

The standards of data quality include: Methodological soundness, Accuracy and reliability, Integrity, Periodicity and timeliness UNESCO 2010. According to (Hua & Heristein, 2003) Quality data establish the mechanisms required to collect, save, produce, and use information in an accurate, secure, and timely manner. (Abdul-Hammid, 2017) Obsolete data, even after produced, may not have much value for use, resulting in missed intervention opportunities and a pervasive distrust from information clients within or outside the organization. Both timeliness and reliability can affect the level of information user confidence and trust in the data. Delay in data production and/or production of unreliable data can easily lead to lack of data use and management frustration, resulting in ineffective planning and budgeting, monitoring and evaluation, policy analysis, and policy-making As (UNESCO, 2017), the production and dissemination of high quality education statistics is essential for effective planning, as well as for monitoring progress towards national and global education targets.

The continuation of EMIS funded by donors or one-off disbursements does a disservice to sustainability of information management and perpetuates the notion that EMIS is both temporary and exogenous. The full potential of EMIS can only be realized when ownership by local staff is created, and this can only come about when a budget is secured (Hua & Heristein, 2003). Computer technology provides technical support to the education management information systems by providing right people with right information at the right time to make best decisions (Sajjid & Awais, 2010).

- 1. Legal Framework
- 2. Organizational Structure and
- Institutionalized Processes
- 3. Human Resources
- 4. Infrastructural Capacity
- 5. Budget
- 6. Data-driven Culture
:
.

- 7 Data Architecture
- 8. Data Coverage
- 9. Data Analytics
- 10. Dynamic System
- 11. Serviceability

Enabling Environment

System Soundness

Utilization for Decision Making

Quality Data

- 16 Openness to EMIS Users
- 17. Operational Use
- 18. Accessibility
- 19. Effectiveness in Disseminating
- Findings/Results

- 12 Methodological Soundness
- 13. Accuracy and Reliability
- 14. Integrity
- 15. Periodicity and Timeliness

Figure 2.3 Effective and Comprehensive EMIS

2.1.4. Practices of Education Management Information System in Ethiopia

Ethiopia is a country that is on a journey to its renaissance targeting at achieving peace, unity-with-diversity, broad and rapid socio-economic growth, establishment of democratic systems and good governance Understanding this crucial role, the education sector has passed through a series of successive, rolling Education Sector Development Programs (ESDP I-V). MOE, 2018

The new Education and training policy developed in 1994, gives grate attention for the implementation of a decentralized, efficient and professionally coordinated participatory system of administration and management of the education system (Education &Training Policy,1994).

Although there had been some statistical reports before, the history of EMIS in Ethiopia may be dated to 1957, the year where a research and statistics department was established in the Ministry of Education (MoE, 2009). Ethiopia's effort to establish modern education management information system started at the end of the 1980 by the name "Education Information System Project" with the assistance from SIDA. Ethiopia's Education Management Information System (EMIS) has grown in recent years. now, EMIS is available at decentralized levels, and with support from the respective ICT directorates and offices, are collecting and processing education

performance data which can be used for enhanced service delivery (MoE, National Education Management Information Systems Module, 2012). This created favorable conditions for EMIS process at all levels of education system and at federal level it's structure was shift to ICT &EMIS Directorate in the year 2015. more authority and responsibility were given to regional education bureaus, woredas and schools, which is under implementation in Oromia education system as well. Recently, in 2019 Oromia Regional State, ICT & EMIS team are integrated as one directorate and responsible for EMIS activities such as collecting & analyzing data, writing the report, publish annual education abstracts and disseminate to all stakeholders.

2.2. Empirical Review

2.2.1. Actionable Areas and key EMIS Assessment Standards

2.2.1.1. ***Enabling environment for The Implementation of EMIS***, (Legal framework, Organizational, structure and institutionalized processes, Human resources, Infrastructural capacity, Budget and Data-driven culture).

The finding of a study conducted in in public elementary schools of Surigao Del Sur Philippines shows that indicator on teachers, parents, students and stakeholders work towards shared goals that will improve student learning ranked the highest and highly effective (Cuartero & Role, 2018). The finding of a study conducted by German (2015) revels lack of organizational readiness, poor coordination and un-organized leadership and the absence of a clear vision/strategic plan for data-driven for decision making and poor information culture which affects the practice of EMIS. Availability of equipment and technical infrastructure at district level even at Provincial level varies and is much dependent upon the donor's support and / or external funding. Only the very basic IT facilities are provided to the district EMIS cells by the Provincial EMIS Office (i.e. Computers and related accessories) (Sajjid & Awais, 2010)

In a study (Sajjid & Awais, 2010) conducted to assess the availability of EMIS ICT technology indicates that the availability of Local area Network in North West Frontier Province In such District EMIS cells, where Local Area Networks are installed but servers used for networking

are outdated and causing many problems in sharing of printers and other resources which shows the existence of local area network for the implementation of EMIS in the school.

The finding of A case study conducted in Kenya Limuru sub-County; Kiambu County conducted by (Waweru, 2014) to assess the adequacy of technological infrastructure that supports Education Management Information Systems revealed that principals and the Sub-County education office staff had more access to computers as compared to the HoDs. The study established that those schools which lacked computers either had not been in existence for long or at one point they had computers which broke down or were stolen. On the other hand, the finding of a research recently conducted by (German, 2015) in Arsi Secondary schools of Oromia regional state, Ethiopia indicate that, majority of respondents, 130(56.30%) respond that, there was shortage of ICT infrastructures, no internet and other electronic means of communication to receive or send data and information with users. The finding shows, with the absence of computers and other electronic means, it is difficult to utilize EMIS properly in school. According to Simon (2017) a digital EMIS which supports timely, decentralized decision-making needs to support multiple user objectives and needs, and be flexible enough to fit various work processes and tasks, while the technology needs to overcome infrastructural challenges and fit with staff skills.

As a research finding of (Sajjid & Awais, 2010) indicates, the absence of advance training in database administration even other computer skills (i.e. hardware maintenance, network administration etc.) are impossible for the district level staff in order to efficiently exploit the database and data entry process. (Waweru, 2014) carried out a study to determine the computer literacy skills among the school HoDs, administrators, school principals and in Kenya Limuru sub-County. The findings revealed that the skills possessed by HoDs were limited as compared to those possessed by the principals and the Sub-County education office staff. Further, computer literacy skills among the Sub-County education office staff were sufficient most of the time while those of principals and HoDs were inadequate. Betiglu (2016) reviles that shortage of budget was also the main problem for ineffectiveness of EMIS in education sector specially in schools.

As Lessons learned from EMISs in Uganda, Mali, and Zambia "creating a sustainable, workable EMIS depends on three factors:

- The right **People**, motivated to perform and skilled in their work;
- The right **Processes** that reduce duplication and reinforce accuracy and accountability; and
- The right **technology**, appropriate to the state of the country, and the reliability of its infrastructure, (Bernbaum & Moses, 2011).

2.2.1.2. *Soundness of the system*, (Data architecture, Data coverage, Data analytics, Dynamic system & Serviceability).

System soundness refers to assessment of the degree to which the processes and structure support the components of a comprehensive information management system (Abdul-Hamid H. , 2014). As Cassidy (2006), an Education Management Information System is a multifaceted, institutionalized system consisting of technological and institutional arrangements for collecting, processing, and disseminating data in an education system. The finding of (Sajjid & Awais, 2010)**,** All the 24 districts of North West Frontier Province are using access database which falls into desktop category and work best for individuals & workgroups. It supports only megabytes of data and creates big problem to the administrators in system scalability if the data gets large. and the risk of data security is very high in each EMIS cell as every individual computer is maintaining its own individual database. Analysis shows that the data is not secure from the virus attack and unauthorized personnel. According to (Shah,2014), a number of inhibitors to MIS use are evident in the literature; foremost among these are lack of time, lack of confidence or skills, lack of training, lack of senior management support, and lack of technical support. MIS can provide administrators and teachers with the information required for informed planning, policy-making, and evaluation. MIS have changed school management in the areas of leadership, decision making, workload, human resource management, communication, responsibility, and planning.

2.2.1.3. *Quality data* (Methodological soundness, Accuracy and reliability, Integrity, Periodicity and timeliness)

The finding of research conducted by (Cuartero & Role, 2018), concludes that, EMIS reports are set with deadline. It becomes a practice to submit reports on or before the given date to avoid

rush and worst is being announced in management committee meeting, on the other hand, (Gizaw, 2016). reported that the existence of lack of accountability for inaccuracy, unreliable, irrelevant, incomplete and not valid data transfer & delay in EMIS data reporting were serious challenges. According to (Hua & Heristein, 2003) Quality data establish the mechanisms required to collect, save, produce, and use information in an accurate, secure, and timely manner.

2.2.1.4., EMIS Data utilization by users

Data being collected, gathered and stored in each module are utilized and disseminated for proper planning in the entire school operation. An average mean of 3.31 qualitatively described as highly effective (Cuartero & Role, 2018). The study conducted in secondary schools of Nairobi City County, Kenya revels that the frequency of use of EMIS for curriculum & instruction, human resource, school-community relation, and finance was generally moderate (Odhiambo, 2017). On the other hand, the study conducted in Addis Ababa, Ethiopia conclude that some of education leaders & experts don't use EMIS data for planning and decision-making purpose (Gizaw, 2016). However, data openness and the trend of giving feedback was considered as main problem. Feedback did not appropriately utilize in order to learn the weakness or achievement observed with all stakeholders. (Ashenafi,2016).

2.3 Conceptual framework of the study

From theoretical as well as from empirical literature review one can conclude that the standardized and effective Education Management System requires Enabling environment, (Legal framework, Organizational, structure and institutionalized processes, Human resources, Infrastructural capacity, Budget and Data-driven culture), System soundness, (Data architecture, Data coverage, Data analytics, Dynamic system & Serviceability), Quality data (Methodological soundness, Accuracy and reliability, Integrity, Periodicity and timeliness), and Data utilization by users.(Openness to EMIS users, Operational use, Accessibility, Effectiveness in disseminating finding/results).
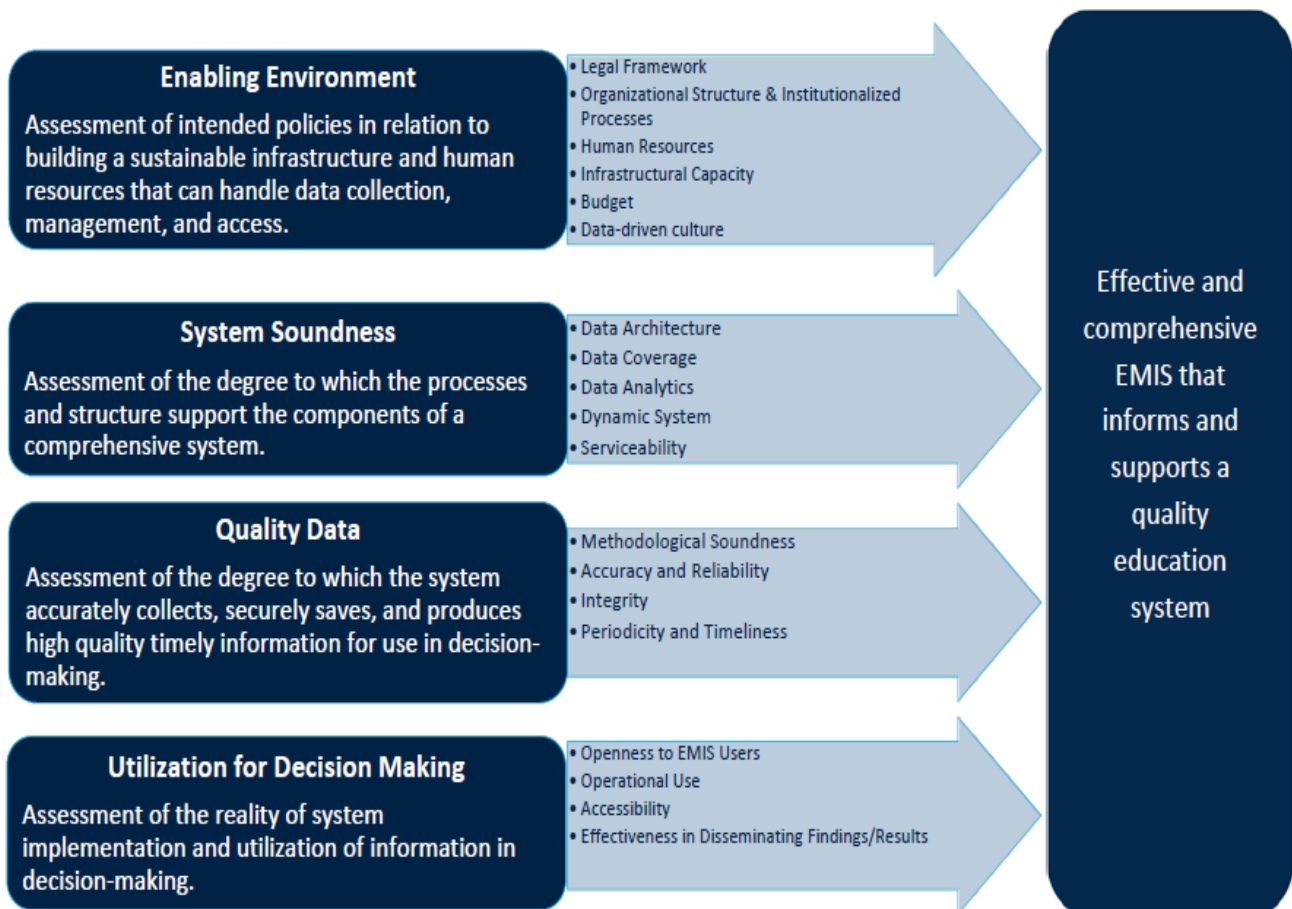
Source: Adopted from Abdul Hamid, 2014, The World bank Group

Figure 2.1 Conceptual framework of the study

CHAPTER THREE

3. RESEARCH DESIGN AND METHODS

3.1. Research Design

In terms of design, the study employs descriptive survey method. The choice of survey design was grounded in its applicability to wider area of investigation. At the same time, it allows collection of data from large number of target population, enabling the possibility of generalization of the findings. Above all, this research design is adaptable to this study because the researcher would get an opportunity to describe the current situation regarding implementation of EMIS. The research design is to provide the collection of relevant evidence with optimum effort, time and expenditure.

For the purpose of the present study, mixed research approach which advocates the combination of both qualitative and quantitative method was used. In this study, quantitative is a prime method of inquiry, where qualitative expressions can be used to indicate the relationship of variables and policy issues regarding the extent of EMIS implementation in Oromia Region. Mixed method approach focuses on collecting, analyzing and mixing both quantitative and qualitative data in a single study or series of studies. The decisive argument here is that the use of both quantitative and qualitative approaches in combination provides a better understanding of research problems than either approach achieves alone (Creswell, 2003).

3.2. Source of Data and data collection techniques

The source of data for this research was from Source of EMIS data (schools), EMIS data producers (EMIS Staff) & EMIS data Users (Stakeholders) from target zones, woredas & regional Bureaus. Further, the Primary data was acquired from field by data collection using structured & open-ended questioners, FGD with representatives of education office at different department as well as school managements members and Interviewee was conducted with external stakeholders. The secondary data was acquired from different documents available at

selected schools, education office, and annual abstract from educational bureau through document analysis & observation.

The data collection method used for this research was qualitative and quantitative methods which includes interviews, questionnaire, focus group discussion, direct observation, and document analysis. Each of them is discussed below. The goal was to receive qualified surveys data from users of EMIS in order to request their feedback on the use of EMIS and possibly identify problems in EMIS implementation which may be the root cause of hindering policy implementation. Several data collection techniques shall be used in parallel to crosscheck the data for validity.

Interview/Discussion

Some interview questions were prepared to gather data from individuals who are in a position to provide important data in more detail. The interview guide was prepared beforehand to ease the conduct of interview session. The interview was conducted face-to-face with EMIS external stakeholders. It was conducted with planners from Regional Plan Commission, Bureau of Finance & Economic cooperation & Women, Youth & Children's Affairs Bureau. The interview was conducted with holding every convenience for respondents. The data was carefully recorded with tape recorder and written in verbatim after words.

Direct Observations

Direct observation was a primary data collection tool. The researcher observed different problems that reduce EMIS's effectiveness by implementing high level goals. Direct observation was very easy to realize the situation. It is possible to look at all issues in the schools, staff and other people involved in EMIS workflow. This method is highly preferred to the researcher in order to understand the existing situation, work flow of EMIS in general and how EMIS reflected in terms of data production and report production. The observation checklist was prepared to observe sample schools, ZEO, WEO and regional education bureau. The observation checklist was prepared keeping an eye on the advantage of directness, diversity, flexibility, and provision of a permanent record and applicability. The data collected through observation was used to cross check the data collected from the questionnaire. It was conducted in Regional Education

Bureau, one ZEO, one WEO and 2 schools (one from secondary urban & another primary school in rural area.)

Questionnaire

Questionnaire, used to gather vast and deep data pertaining to the issue under investigation. In this study, structured and open-ended questionnaire was used as the main data gathering instrument because it is the tool more helpful to get accurate and relevant data from the sample units. Besides, it is important to get valuable data from large number of respondents in a relatively shorter time with reasonable cost. The questionnaire includes two main parts. The first part was intended to collect demographic data of respondents including the following characteristics: age, sex, educational qualification, occupational status or years of teaching experience and information of their school. The second part contains both closed and open-ended question items intended to answer the basic research questions.

Participants were asked to make different types of judgments by using a very reliable and flexible scale. In this study, the questionnaire was designed in Likert scale because it is the useful measurement method to produce items suitable for rapid response and analysis. That is, it is a simple way to describe opinions, suggestions and frequency of respondents, and so do it provide more freedom to respondents. The questionnaire items were prepared initially in English language and later translated into Afan Oromo and the same version was administered to all respondents. This is vital to contribute to reliability of items, which may be committed due to language barrier otherwise. For those non Afan Oromo speaker respondents, particularly selected from secondary schools, the English version was distributed. In this way, the questionnaire is used to collect data from selected primary & secondary schools directors, EMIS Staff and respective EMIS internal & external stakeholders.

Document Analysis/Annals study/ historical record study

This data collection tool is used to get data from written documents such as manuals of EMIS, Education statistics annal abstract, organization's vision & mission, legal-framework, feed-back documents, report format, and similar documents that have been used. By looking through the

existing relevant documents or literatures researcher try to understand and analyze the issues related with the performance evaluation of EMIS system.

Focus Group Discussion

Focus group discussion (FGD) was conducted for the objective of finding deep rooted problems by collecting data from shared understanding through interviews with concerned group in the education sector. The discussion was conducted in two schools, one woreda Education Offices, one zonal education office & Regional Education Bureau. The group was comprised of 8 members at regional level, 6 at woredas and 4 at school level. The FGD members were concerned education data users in education office and represented from each department. The FDG was conducted before Covid-19.

3.3. Target Populations and Sampling Techniques

In this study, 272 schools were drawn from total of 908 schools in 103 sampled woredas (i.e., Oromia) A convenient way was dividing the area into a number of smaller non-overlapping areas, following geographical division of the region. This is appropriate when the geographic distribution of the individuals is widely scattered; for example, when it is needed to select a sample from all public & privet schools in Oromia National Regional State. In the context of this study, area clustering came into effect to subdivide zones within their similar geographic areas which are themselves clusters of still smaller units and then some of these clusters are randomly selected for inclusion in the overall sample. By virtue of vast geographic coverage of Oromia in the country, using cluster sampling technique, depending on their socio-economic setup 20 zones in Oromia was clustered into three main areas, namely, Cluster of East and South Eastern Oromia zones, Cluster of Central Oromia Zones & Cluster of West and South Western Oromia zones. Accordingly, two zones & one administrative towns were represented each cluster was randomly selected for inclusion in the study.

Literature indicates multistage sampling is an extension of cluster sampling. Subsequently, a multi-stage sampling technique was employed to select representative woredas and schools. By this technique six zones namely Borena, East Hararge, Oromia Special Zone Surrounding Addis Ababa, East Shoa, West Wollaga, Jimma & three administrative towns (Robe, Bishoftuu and

Nekemte) were selected. Similarly, from sample zones 12 woreda (two woreda from each zone i.e. 10%) was selected. The last stage was the selection of representative schools This required getting a sample frame of population school directors in 12 woredas and three towns. According to the 2018/19-year Annual Statistical Abstract of the Oromia Education Bureau, the total school population the target woredas were 908. Based on number of populations obtained, the total no of respondent from primary& secondary schools are 272(30%), Moreover, respondent of EMIS staff and stakeholders were selected using purposive sampling technique. The sample population of EMIS staff was 25 and respondent of EMIS data users (Stakeholders) were 83 therefore, Overall number of sample population was 380.

Table 3.1 Sample Population

Cluster	Sample Zone & Administrative Town	No. of Woredas	Sample woredas	Total No. of schools (N) Total	No. of sample schools. (n) No.	%	No. sample EMIS Staff	No. of Sample stakeholders	Total, No. of Respondent
East and South Eastern Oromia (Pastoral areas)	Borena	14	Moyale	39	12	31	1	3	16
			Yaballo	25	8	32	1	3	12
			ZEO				1	2	3
	East Hararge	24	Fadis	76	23	30	1	3	27
			Kombolcha	62	19	31	1	3	23
			ZEO				1	2	3
	Robe Town	1	Robe	22	7	32	1	3	11
Central Oromia (Extensive farming)	Oromia Special Zone Surrounding Addis Abeba	7	Sebeta Hawas	53	16	30	1	3	20
			Walmara	49	15	31	1	3	19
			ZEO				1	2	3
	East Shoa	11	Bosat	87	26	30	1	3	30
			Dugdaa	95	29	31	1	3	33
			ZEO				1	2	3
	Bishoftuu Town	1	Bishoftu	90	27	30	1	3	31
West and South Western Oromia (Coffee growing)	West Wollaga	23	Nejjo	48	14	29	1	3	18
			Guliso	54	16	30	1	3	20
			ZEO				1	2	3
	Jimma	21	Sokorruu	78	23	29	1	3	27
			Gommaa	79	24	30	1	3	28
			ZEO				1	2	3

Nekemte Town	1	Nekemte	51	15	29	1	3	19
CTE						0	10	10
OEB						4	8	12
External EMIS Stakeholders						0	8	8
Total	103	15	**908**	**272**	30	25	83	**380**

Source: OEB, 2017/18 Annual Education Abstract

3.4. Method of data analysis and presentation

After the data collection accomplished, data was preprocessed, organized and analyzed. Qualitative data was analyzed with thematic analysis techniques which are widely used. Quantitative data was analyzed using descriptive statistics. For this specific study, based on the types of data gathered and the instrument used, both quantitative and qualitative techniques of data analysis were employed. To get the collected data ready for analysis, the questionnaires were checked for completion, classified and then tallied by the researcher himself.

The frequency counts and percentages were used to analyze the background information of the respondents, whereas the quantitative data obtained in relation to main questions of the study was analyzed by using mean scores with standard deviation. The scores of each item was statistically organized and imported into Statistical Package for Social Sciences (SPSS-20) to obtain sum, mean value and standard deviation. To compare and test whether the mean scores of the groups of respondents are statistically significant or not, one-way Analysis of Variance (ANOVA) will used. All differences were tested for statistical significance at $\alpha = 0.05$ level in order to tolerate errors that occurred due to chance.

Additionally, at the conclusions stage the SABER–EMIS Assessment Tool was used to indicate the current status of EMIS implementation in the region. The Systems Approach for Better Education Results (SABER)–EMIS tool provides a structured methodology to assess and benchmark the enabling environment, system soundness, data quality, and utilization for decision making. Such assessment should guide the planning, design, and implementation of any EMIS-related investments because it could reduce cost, eliminate redundancies, identify priorities,

highlight what to do and not to do, and help in the sustainability of investment in data systems. (Abdul-Hamid H. , 2014).
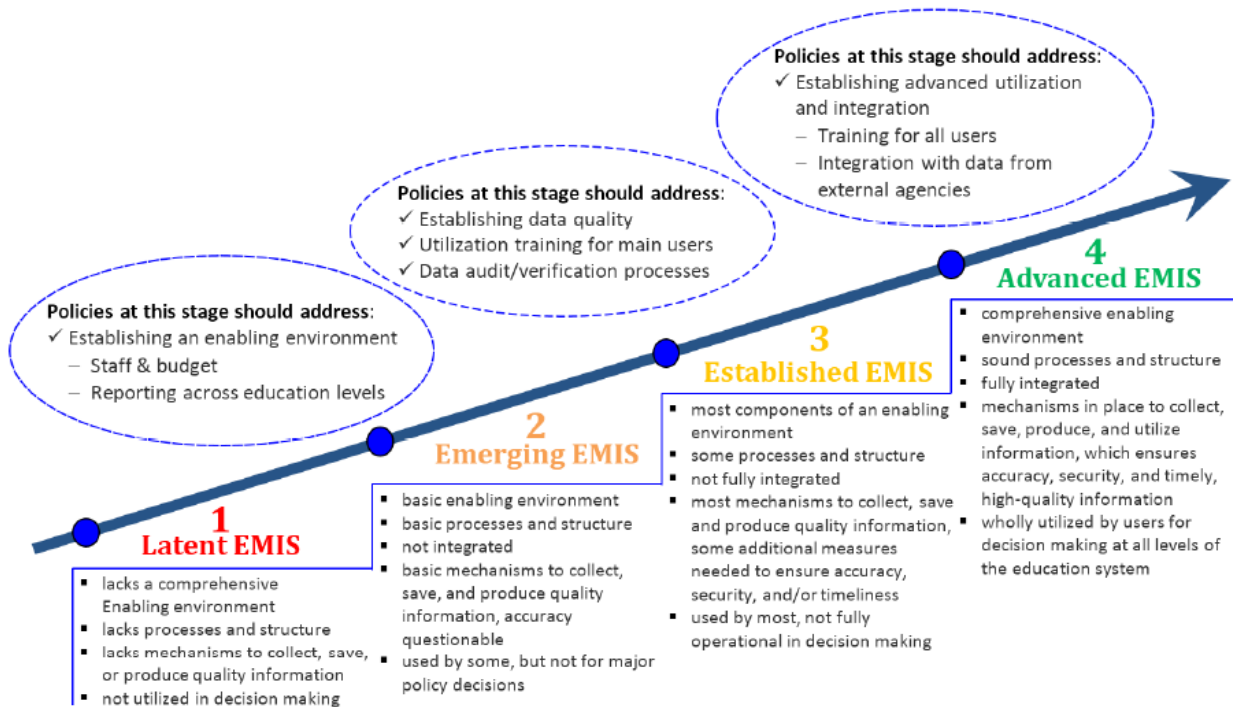
Figure 3.1. EMIS Implementation Levels and Associated Policy Recommendations.

Source: World Bank, 2015

On the other hand, qualitative data was analyzed through text description and narration methods to substantiate the data collected through the questionnaires and to validate the findings of the study. Finally, the information obtained from the FGD, interview sessions and document analysis & observation checklist are presented and analyzed qualitatively as well as quantitively by rated using Likert scale (1-5) by a researcher to evaluate the basic indicators of effectiveness of the EMIS implementation. At the final stage, the average mean value of respondent's response & the mean average value of the researcher rating was converted to 4 score to match with SABER EMIS Assessment Tool for the final conclusion and ranking.

3.5. Ethical Considerations

The basic ethical issues considered in this research were: informed agreements, respect for anonymity or secrecy and respect for privacy (Bryman, 2004). AS ethics of any research, the researcher gives great attention to professional as well as basic principles of research. The researcher get approval from Jimma University before proceed to any action and considers the guideline provided from the university. Regarding the secrecy of respondent before directly go to in depth interview and filing out the   questioners the researcher was propose a set of ethical and moral procedures and informed that, the information they provide remain confidential and not connected to any external body. For this purpose, the researcher informed the participant not to write their name and name of their schools on the questioners. All the citation in the text from source are listed in the reference. Confidentiality and security of data is also maintained.

3.6. Validity and Reliability

To secure the validity and reliability of the instruments with the objective of checking whether or not the items included in the instrument could enable the researcher to gather relevant information the pilot test was conducted. Besides, the necessary amendments were made to correct confusing and ambiguous questions before it is statistically processed. Therefore, Pilot study was conducted in one woreda 2 primary and 1 secondary school where 3 school principals, 1 woreda EMIS experts, and 2 Regional Education Bureau experts were respondents for pilot test. Moreover, all data collection tools were commented by Oromia Education Bureau experienced experts and senior EMIS advisor for UNICEF at regional level.

CHAPTER FOUR

4. RESULT PRESENTATION AND ANALYSIS

Introduction

This part deals with the analysis, interpretation & discussion of the research finding from the sample respondent through questionnaire, interview, FGD, observation, and document review. The study investigated the implementation status of Education management Information System (EMIS) in Oromia regional state. In this study the status of enabling environment for the implementation of EMIs, the processes of data production, data quality & data utilization for decision making were the main attention areas.

The information was gathered from the source (School Principals), data producers (EMIS staff) and data users (Stakeholders). The respondents were from education sector and other stakeholder sectors as well as non-governmental organizations which are located in regional and local areas. The detailed analysis is presented below.

4.1. Response Rate

This section presents the response rate of target group and the return rate of questioners.

Further, a summary of category of the respondents is presented below.

Table 4.1 Questioners Return Rate

Questioners Return Rate & Total No of Respondent

Respondent	School Principals	EMIS Staff	EMIS stakeholders	Total
Target	272	25	83	380
Actual	245	25	83	353
Percent	90.1	100	100	92.9

Source: Survey, 2020

As shown in table 4.1 above, the return rate of questioners was 90.1% for school principals, 100% for EMIS staff & EMIS stakeholders. The total return rate was 92.9%.

Which is acceptable representative as recommended by Bryman (2004) who claims that response rate of more than 70% is good for generalization.

Table 4.2. Gender of The Respondent

Gender of Respondents

Gender	School Principals		EMIS Staff		EMIS Stakeholders		Total	
	N	%	N	%	N	%	N	%
Male	207	84.5	23	92	67	80.7	297	84.1
female	38	15.5	2	8	16	19.3	56	15.9
Total	245	100	25	100	83	100.0	353	100.0

Source: Survey,2020

As shown from table 4.2 above the percentage of female respondents were 15.5%, 8% & 19.3% for School principals, EMIS staff & EMIS stakeholders respectively. From the total respondent of 353 the no of female was only 56(15.9%) which was too low. According to (Mónica Segovia-Pérez & Others, 2019) the low participation of woman in information and communication technology (ICT) professions was, due to it's traditionally been largely monopolized by men. Segregation, gendered stereotypes and environmental factors. Increasing the participation of women in ICT have a clear implication on supporting the women rights, gender equality and economic empowerment. It also views the promising circumstances that could foster the girls/women in ICT education and employment as well as countries overall development.

Table 4.3. Level, Ownership and Location of Target School

School Level			*School Ownership*			*School Location*		
	N	%		N	%		N	%
Primary	219	89.4	Public	205	83.7	Urban	106	43.3
Secondary	26	10.6	Privet	28	11.4	Rural	139	56.7
Total	245	100	NGO	7	2.9	Total	245	100
			Community	5	2			
			Total	245	100			

N= Number of Respondent
Source; Survey,2020

As shown from table 4.3 , from total of 245 target schools 219(89.4%) was primary school and 26(10.6%) was secondary. Regarding to ownership,205(83.7%) was public/government owned, 28(11.4%) privet owned, 7(2.9%) owned by NGO and 5(2%) of schools was owned by community. On the other hand, from all 245 target schools, 139(56.7%) located in rural area where as 106(43.3%) located in urban area. This classification is helpful for further investigate of the status of EMIS implementation with regard to schools' level, ownership & location.

Table 4.4. Professional Qualification of Respondents

Respondent Group		Diploma		First Degree		Second Degree		Valid Percent
	N	f	%	f	%	f	%	
School Principals	245	34	13.9	187	76.3	24	9.8	
EMIS Staff	25	1	4.0	21	84.0	3	12.0	
EMIS stakeholders	83	2	2.4	49	59.0	32	38.6	
Total	353	37	10.5	257	72.8	59	16.7	100.0

N=Number of Respondent,   F=frequency
Source: Survey, 2020

Table 4.4 above shows that, education qualification of respondent was 10.5%, 72.8% &16.7% for diploma, first degree& second degree respectively. This shows that the huge number of respondent (89.5%) were first-degree & second-degree holders which is at good professional qualification. Some study shows that good education qualification is base for chance of using modern technology. (Afshari, Bakar, Luna. Samaha & Fooi 2004).

Table 4.5 Field of Study for EMIS Staff

Field of Study	Frequency	Percent	Valid Percent	Cumulative Percent
EDPM	5	2.0	20.0	20.0
ICT	4	1.6	16.0	36.0
Statistics	1	.4	4.0	40.0
Another subject	15	6.1	60.0	100.0
Total	25	10.2	100.0	

Source, Survey, 2020

As shown in table 4.5 above, field of study of the EMIS team from regional education bureau, zonal and woreda education office were 20% EDPM, 16% ICT, 4% Statistics & 60% other subjects. As OEB structure, Statistics, ICT& EDPM professions were seen as a valid for the position of EMIS. However, this survey shows that 60% of the respondent in the target area were specialized the subject that was not directly related to their job. Which may lead to further investigation to find out the relationship between subject area specialization and usage of modern technology to produce reliable EMIS reports.

Table 4.6 Respondent's Age

Age	Respondent						Total	Valid Percent
	School Principals		EMIS staff		EMIS Stakeholders			
	F	%	f	%	f	%	f	
<30	28	11.4	4	16.0	7	8.4	39.0	11.0
31-35	124	50.6	7	28.0	26	31.3	157.0	44.5
36-40	59	24.1	5	20.0	18	21.7	82.0	23.2
41-45	19	7.8	5	20.0	13	15.7	37.0	10.5
>45	15	6.1	4	16.0	19	22.9	38.0	10.8
Total	245	100.0	25	100.0	83	100.0	353.0	100.0

f=frequency, %= percent

Source: survey, 2020

As shown from 4.6 above, 11% of the respondents was below age 30, 44.5% between age 31-35, 23%, between age 36-40, 10.5% between age 41-45 and 10.8% above age 45. The result of the above table shows that most of the respondent 88.2% were below age 45 at good status to well use modern technology. A study conducted by Korpinen, Pääkkönen, & Gobba, 2014) reveals that, the skills to use ICT can vary in different age groups and as age increases, the skill & ability of using ICT decreases. Specially people over 50 year has the lowest ICT skill.

Table 4.7 Work Experience of Respondent

Year of Experience	EMIS Staff		School Principals		Stakeholders		Total	
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
0-5	3	16.67	10	55.56	5	27.78	18	5.10
6-10	5	5.05	80	80.81	14	14.14	99	28.05
11-15	6	4.92	95	77.87	21	17.21	122	34.56
16-20	4	6.78	34	57.63	21	35.59	59	16.71
>20	7	12.73	26	47.27	22	40.00	55	15.58
Total	25		245		83		353	100.00

Source: survey 2020

As shown from table 4.7 of above, the work experience of the respondents shows that, 5.10 % of them were below 5 year,28.05% were between 6-10 years, 34.56% between 11-15 years, 16.71% were between 16-20 years and 15.58% were above 20 years. From this result one can understand that most of the respondent 66.85% have work experience above 10 years. This implies the existence of experienced human resource for the implementation of EMIS in the region.

4.2. Existence of Enabling Environment for EMIS Implementation

Enabling environment for the implementation of EMIS evaluated on the basis of the existence of legal framework, organizational, structure and institutionalized processes, human resources, infrastructural capacity, budget and data-driven culture. The items presented in a Likers type scales, (1-5) with, (1= not exist 2= rarely exist; 3= partially exist; 4= mostly exist, 5= fully exist). For the purpose of analysis, the mean values were interpreted as, from 1.0 - 1.49 = very low, 1.50

- 2.49 = low, 2.50 - 3.49 = medium, 3.50 - 4.49 = high, and 4.50 - 5.00 = very high, (Bluma, 2012). The result of the finding analyzed in the table below.

Table 4.8. *Existence of Enabling Environments*

Item	Respondent	N	Mean	SD
1. Existence of legal-framework	EMIS Staff	25	2.1	1.038
2. Existence of organizational structure and institutionalized processes	EMIS Staff	25	4.56	.507
3. Existence of qualified and sufficient human resources	EMIS Staff	25	3.84	.987
4. Existence of modern technology & Infrastructural capacity to implement EMIS.	EMIS Staff	25	2.96	.98
	School principals	245	1.91	1.02
	Total	270	2.43	1.00
5. Existence of necessary budget for EMIS implementation	EMIS Staff	25	3.32	1.108
	School principals	245	1.92	1.033
	Total	270	2.62	1.070
6. Existence of data-driven Culture	EMIS Staff	25	2.84	1.313
	School principals	245	2.29	1.268
	Total	270	2.56	1.29

GM=3.01

Key: N=Number of respondents, SD=Standard deviation, GM=Grand mean

Source: Survey, 2020

As shown from table 4.8 regarding existence of legal-framework, The mean value of a response for the existence of legal-framework for EMIS implementation was 2.1, which was

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considered as low level of agreement for the group. According to the FGD conducted at regional and local level most of the EMIS experts don't have clear information about the EMIS Legal Framework. By using observation checklist & document analysis techniques a researcher Couldn't find any written legal framework document which shows a responsibility and accountability of concerned bodies. As (UNESCO 2003). most countries have not formulated policies on how to use EMIS data in planning and decision making. Even in countries where information systems are institutionalized, they are barely used to guide education policies. EMIS is internally accountable for activities such as technical data collection, data entry, data processing, producing data reports and meeting necessary report requests. External accountability refers to the actions that must be taken by other units on behalf of EMIS, such as budget support, policy research and analysis, and collaboration with other divisions and policy guidelines in data and information sharing It is clear that lack of accountability & responsibility for data leads to lack of reliability for data produced by education sector and finally it can lead the bureau to loss it's integrity.

The mean value of respondent for existence of organizational structure and institutionalized processes (item 2. table 4.8) was 4.56 and considered as very high level of agreement for the group. From FGD and observation a researcher observes that, at regional level the EMIS staff is structured as a team and integrated with ICT team and act as ICT& EMIS Directorate. At zonal and woreda level the ICT experts & EMIS experts are assigned under the same directorate as a case team. This finding was contradicting with the finding of a study conducted in Addis Abebe City, Beteglu (2016) replied that, unavailability of proper organization and an autonomous EMIS structure for all levels of the education systems of AAEB that profoundly influences the performance of EMIS and by large the quality of education in the region On the other hand, at school level, only secondary schools have a structure of statistician. At primary school level the school director or vice director is responsible for school data. Lack of responsible person for data at school level leads to the production of non-quality data. And needs attention in the future.

Item 3 of table 4.8 3. (Existence of qualified and sufficient human resources) shows that, the mean value of the respondents regarding the existence of sufficient & qualified human resource to produce EMIS data was 3.84 which was considered as high level of agreement for the group.

In addition to this from respondent professional information table 5 & table 8 above, we can observe that, most of EMIS staff were professionally fit & experienced. On the other hand, From FGD & open-ended questions most respondents replied that, there were no sufficient human resource who can carry out the existing work load. In addition, they replied that there was high turnover due to the existence of unbalanced work load & salary to the position. The researcher also observes that there was turn over due to un attractiveness of the salary. As Tegegn (2003) The manpower requirement for EMIS depends mainly on the amount of work involved in completing specific task and must have data manager, survey administrator, Satiations, data analyst and MIS Experts. Oromia Education Burau should expand the structure as required and design a strategy to retain the human resource at the position of EMIS.

Item 4 of table 4.8 above shows that, the mean value of respondents regarding availability of modern technology & infrastructure was 2.96 for EMIS staff and considered as medium level of agreement for the group while the mean value for principals was 1.91 and considered as low. Level of agreement. The overall mean value also shows 2.43 which was considered as low level of agreement. From FGD and observation checklist a researcher observes that the availability of functional computer, internet Access and different ICT facilities are mostly available at regional education bureau, zonal and some woreda education offices. In the contrary, at school level only few schools in the urban area have ICT facilities like computer, printer, photocopier and internet. In addition to that for most of the computers in school are not functional or outdated particularly at schools and WEOs, data were used to be collected and analyzed manually. The problem of network, modern technological data collection tools like web-based application, tablets, PC and others was the main challenge as raised on FDG. The finding of a study conducted in Kenya, Waweru (2014) revealed that principals and the Sub-County education office staff had more access to computers as compared to the school heads of departments. The study established that those schools which lacked computers either had not been in existence for long or at one point they had computers which broke down or were stolen. Similar result was obtained by the study conducted in Ethiopia Arsi zone. German (2015) explains that, there was shortage of ICT infrastructures, no internet and other electronic means of communication to receive or send data and information with users From this finding it was concluded that inaccessibility of ICT

material, infrastructures and network was bottleneck problem for the effective implementation of EMIC in the region and the region should take measurable action to improve it's accessibility.

Item 5 of table 4.8, shows that the mean value of the response regarding the existence of necessary budget for EMIS implementation for EMIS staff was 3.32 and considered as moderate level of agreement for the group, while that of school principals were 1.92 which was considered as low level of agreement. From FGD & document analysis a researcher confirmed that education office has more opportunities of getting financial supports from government and UN agencies than schools for the implementation EMIS. Beteglu (2016) reviles that shortage of budget was main problem for ineffectiveness of EMIS. Lack of budget at school level has great implication for lack of necessary infrastructures for the implementation of School Management Information System (SMIS) & production of quality data at school level. Concerned bodies should give great attention during budget allocation.

As shown from table 4.8 item 6, the mean value of respondents for the existence of data-driven culture in education sector were 2.84 for EMIS staff which was considered as medium level of agreement, while that of school principals were 2.29 and considered as low level of agreement for the group. The idea raised by FDG members indicates that, there was less effort of government and non-governmental organizations to promote the effective collection and utilization of data. Moreover, according to German (2015) lack of organizational readiness, poor coordination and un-organized leadership and the absence of a clear vision/strategic plan for data-driven for decision making and poor information culture which affects the practice of EMIS Data -driven culture is more valuable for policy makers. They can use education statistics as points of reference for political decisions, Planning purpose, resource allocation, performance evaluation and others.

In conclusion the average mean for the existence of enabling environment for the implementation of EMIS was 3.01 which shows its status at medium level. As Lessons learned from EMISs in Uganda, Mali, and Zambia "creating a sustainable, workable EMIS depends on three factors: the right People, motivated to perform and skilled in their work, the right Processes that reduce duplication and reinforce accuracy and accountability; and the right technology,

appropriate to the state of the country, and the reliability of its infrastructure, (Bernbaum & Moses, 2011). unavailability of legal-framework, modern technology and infrastructure, necessary budget and data-driven culture has a great impact on quality and timeliness of education data. and needs great attention from all concerned bodies.

4.3 System Soundness

System soundness of EMIS includes: Data architecture, Data coverage, Data analytics, Dynamic system and Serviceability. It encompasses the processes, structures, and integration capabilities that bring data together within the data system and the data coverage indicates major types of education data, including administrative, financial, human resources, and learning outcomes. (Abdul-Hammid, 2017). Depending on these indicators the result of information collected from respondent is analyzed in the table below.

The items presented in a Likers type scales, (1-5) with, 1= strongly-disagree, 2=disagree, 3=undecided, 4=agree & 5=strongly-agree. For the purpose of analysis, the mean values were interpreted as, from 1.0 - 1.49 = very low, 1.50 - 2.49 = low, 2.50 - 3.49 = medium, 3.50 - 4.49 = high, and 4.50 - 5.00 = very high and the finding is analyzed in the table below.

Table 4.9 System Soundness

Item	Respondent	N	Mean	SD
1. EMIS data architecture is exist and fully implement	EMIS Staff	25	1.84	1.248
2. The data covers all performance indicators of education system.	EMIS Staff	25	4.44	.507
	School principals	245	3.96	1.069
	Total	270	4.20	0.788
3. Scientific methods of data analysis are implemented	EMIS Staff	25	3.16	1.281
4. The system is dynamic and easily adaptable to allow changes	EMIS Staff	25	2.92	1.412
5. Data collection instruments are carefully designed & easily serviceable	EMIS Staff	25	4.16	.688
	School principals	245	3.06	1.191

		Total	270	3.61	0.939

GM=3.2

Key: N=Number of respondents, SD= Standard Deviation, GM =Grand Mean

Item 1 of table 4.9 (Existence and full implementation of EMIS data architecture) shows that, the mean value of the response was 1.84 which is considered as low level of agreement between a group of respondents. From observation checklist & FGD a researcher observes the data management system recently functional was the "Three Tier data architecture" that contains data warehouse, system manager and user interface which is internationally acceptable. However, the blueprint of the data architecture was not developed yet. In short, a successful EMIS cannot exist in a vacuum without data Architecture & it's Blueprint.

 Item 2 of table 4.9, 2. (The data covers all performance indicators of education system). shows that, the mean value of respondent was 4.44 for EMIS staff & 3.06 for school directors. The average mean value for both group of respondents were 4.20 which is considered as high level of agreement between respondent group. From open ended questioner and FDG most of the school directors & EMIS data users (stakeholders) replied that the necessary information was collected and presented in the annual education abstract while some of them recommended to include School inspection report, block grant budget information, detail teaching & non-teaching human resource information. In contrary, some respondents recommend to minimize the size of the contents on the print out of annual education abstract to maintain its size. From the document review, open ended question responses, FDG, interview & annual education statistics abstract content analysis a researcher observed that the data covers almost all of education system performance indicators. To maintain the size of the printed document some of the data collected by school census were not included in to the annual abstract document. For example, school inspection result, non-teaching staff information & others different data were collected by school census but these are not included in the print out. On the other hand, including geographical location or school distribution map, the detail information of gender, Special need education, HIV intervention and co-curricular activities information was seen as an exemplary & good practice. The data in the EMIS is comprehensive, contains some private data, and covers major types of education data, including administrative, financial, human resources, and learning

outcomes (Abdul-Hamid H. , 2014) The gap observed was that, financial and human resource information were not treated well in the annual education abstract. and the area which needs attention in the future.

Item 3 of table 4.9, shows that, the mean value of respondent regarding the application of scientific method of data analysis, was 3.16 which is considered as medium level of agreement within the group. From open ended questions and document analysis it was observed that descriptive & explanatory data analysis, data tabulation, trend analysis, scenario analysis, cohort analysis, longitudinal method was the process mostly applied to analysis data. Besides, tools mostly used to perform data analysis were stat-Educ, EMIS App, Arc GIS software, percentage & mean value. The output of the analysis was displayed through, basic tables and graphs with narration. Generally, the grand mean for the system soundness was 3.2 which is considered as moderate level of agreement between the group. From this finding one can conclude that most of internationally accepted methods of data analysis was applied. But for the future it needs more modern web-based data analysis techniques.

Item 4 of table 4.9 shows that the mean value of respondent regarding the adaptability of the recent data system was 2.92 which was considered as medium level of agreement between the group. From information gathered through FGD and observation checklist it was understood that the current system can't collect data automatically and can't produce report by itself. Data is collected manually and report is produced using excel sheet. This shows that the system is non-dynamic which is not elastic and can't easily adaptable to allow for changes to provide solutions to emerging needs including advances in technology. This finding was concurred with the finding of a study conducted in Pakistan and conclude the non-adaptability of the system and while database was neither linked with the provincial database nor with other related ministries. (Sajjad &Hawis,2010). This have negative implication on quality & timeliness of data produced. Thus, system adaptability needs improvement for the future.

Item 5 of table 4.9 shows that the mean value regarding design of data collection instruments & easily serviceability of data produced was 4.16 for EMIS staff, while that of school directors were 3.06. The average mean value for both groups were 3.61 and considered as high level of agreement for the groups. Besides, from open ended question and FGD most of respondents replied that data collection instruments were designed well and the data produced were easily

serviceable with some exceptions. This finding was in line with the finding of German (2015) that concludes, data collection instrument was suitable and easy for users. From document analysis a researcher observes that data collection instruments were well designed and easily serviceable. However, since the data was collected manually it makes the work exhausting.

4.4 Quality Data

The standards of quality data include: Methodological soundness, Accuracy and reliability, Integrity, Periodicity and timeliness. The items presented in a Likers type scales, (1-5) with, 1= strongly-disagree, 2=disagree, 3=undecided, 4=agree & 5=strongly-agree. For the purpose of analysis, the mean values were interpreted as, from 1.0 - 1.49 = very low, 1.50 - 2.49 = low, 2.50 - 3.49 = medium, 3.50 - 4.49 = high, and 4.50 - 5.00 = very high and the finding is analyzed in the table below.

Table 4.10 Quality Data

Item	Respondent	N	Mean	SD
1. Data recording systems follow internationally accepted standards and methodologically sounds	EMIS Staff	25	4.08	.759
	School principals	245	3.58	1.086
	Total	270	3.83	0.923
2. Source data, statistical techniques and outputs are accurate & describe reality	EMIS Staff	25	3.40	1.000
	School principals	245	3.11	1.231
	Total	270	3.26	1.116
3. There is integrity & public trust regarding EMIS data output	EMIS Staff	25	4.16	.746
	School principals	245	2.96	1.084
	Total	270	3.56	0.915
4. The administrative school census is conducted within a given period & timeline	EMIS Staff	25	4.64	.700
	School principals	245	4.04	1.084
	Total	270	4.34	0.892

GM=3.75

Source: Survey, 2020

Key: SD= Standard Deviation , GM=Grand Mean

Item 1 of table 4.10 above shows that, the mean value of respondent regarding methodologically soundness of data recording systems was 4.08 for EMIS staff & that of School principals was 3.58 and the average mean for both groups was 3.83 and considered as high level of agreement between a group. Additionally, from a document review, a researcher observes that, there was defined education system classifications such as level of education as (KG, ABE, primary, secondary & CTE) and type of school (e.g., public or private school). Moreover, the scope of EMIS data was broader with many performance indicators such as measurements of enrollment, Gender parity index, student teacher ratio, completion rate and many others. Data collection tools, data analysis methods, data dissemination strategies & data utilization recently applied in the region follow internationally accepted standards and methodologically sounds. However, it needs improvement to cope up with modern web-based applications.

Item 2 of table 4.10 shows that, the mean value of respondent regarding the accuracy & reliability of source data, statistical techniques and outputs, was 3.40 for EMIS staff and that of school principals was 3.11 and the average mean of both groups were 3.26 which is considered as moderate level of agreement. Information gathered from open-ended questions and FGD shows that, most of the respondent support the idea of accuracy & reliability of source data, statistical techniques and outputs while source data were collected by means of an administrative school census. and approved at all level. On the other hand, some FDG members and open-ended question respondents replied that data gathered by EMIS and from other education office experts has some difference which shows the existence of same gap. Most of respondents indicate lack of specific reference for recording age of students and absence of school management information system (SMIS) at school level as main challenge and basic cause for unreliability of EMIS data. From document review, a researcher investigates that the value of primary education net enrolment rate (NER) of most zones and administrative towns was above 100% this is contradicting with the reality that NER can't exceeds 100%. which was connected to the problem of school age population projection. From FDG it was understood that different data validation & verification strategies were implemented to minimize data error. As members of FGD mentioned, data collected from school were stamped and approved by authorized person at school level, woreda education office & zonal education offices and at final stage data encoding

and verification was done by EMIS team at all level. Finally, before the report is introduced to higher officials and external stakeholders the draft of preliminary report is distributed to concerned bodies of all departments and open for any comment and idea. According to (ADEA, 2009). The Ministry of Education must have a clear legal mandate to collect information from all education and training institutions and bodies However, to improve the accuracy and reliability of education data the bureau should implement modern data quality assurance techniques.

Item 3 of table 4.10 shows that, the mean value of respondent regarding the existence of integrity & public trust on EMIS data output, was 4.16 for EMIS staff and considered as high level of agreement, were as the mean value for school principals was 2.96 which is considered as medium level of agreement within the group. The average mean value for both groups were 3.56 and considered as high level of agreement. From FGD it was understood that EMIS staff exercise their profession with technical independence and without outside interference that could violate public trust in EMIS statistics and Oromia Education bureau itself moreover, reports and analysis undertaken by EMIS for publication was subjected to internal review to maintained the bureau's reputation for professionalism. Which can increase integrity & public trust on education data produced by EMIS. According to (Hua & Heristein, 2003) Quality data establish the mechanisms required to collect, save, produce, and use information in an accurate, secure, and timely manner. The gaps observed regarding this issue were the issue of transparency and ethical standard. Even thought, EMIS staff follows clear standards of good conduct those standards were not well defined and clear to both internal & external stakeholders. The term under which statistical data was collected, processed and disseminated were not clearly transparent and available to the public and needs improvement.

Item 4 of table 4.10 shows that, the mean value of respondent regarding periodicity & timeliness of administrative school census was 4.64 for EMIS staff and considered as very high level of agreement while that of school directors were 4.04, which was considered as high level of agreement. The average mean value for both groups were 4.34 and considered as high level of agreement. From FGD and document review it was observed that unpublished quick abstract (data on excel sheet) is produced and distributed for internal users at the middle of every year. The education statistics annual abstract is analyzed, printed and distributed one year after a fiscal

or academic year, constantly every year. From this finding it can be concluded that the administrative school census is conducted within a given period & timeline. This finding contradicts with the finding of (Ashenafi 2017) Tesfaye which conclude that the existence of delaines in reporting the repot. However, from interview conducted with external stakeholders it was observed that since the quick abstract was not distributed to them, they were not much convenient with the periodicity of data dissemination. Regarding periodicity, the researcher also observes that production of reports and other outputs from the data warehouse was not in accordance with cycles rather administrative school census data, learning outcome & financial reports were produced together once a year., learning achievement surveys were not conducted according to the regional monitoring needs. So, the bureau should take this fact in to consideration for the future.

4.5 Data Utilization

EMIS data is utilized by different internal and external users to make decision as at different level. Accurate information on education sector performance enable decision makers to make informed decision. As (World Bank EMIS Framework, 2014) Indicators for EMIS data utilization includes data openness for users, data usage for operational use, data accessibility & dissemination effectiveness. The result of the finding is indicated in the table below.

Table 4.11 Data Utilization

Item	Respondent	N	Central Tendency		One Way ANOVA	
			Mean	SD	F-Value	P-Value
1. EMIS data is open and Stakeholders have an access to comment in order to upgrade it	EMIS Staff	25	2.76	1.332		
	School principals	245	2.17	1.124		
	Data Users	83	2.47	1.075	2.24	0.11
	Total	353	2.47	1.177		
2. Data produced by an EMIS is used for operational use and helps for planning, monitor & evaluate the education system	EMIS Staff	25	4.48	.510		
	School principals	245	3.45	1.304		
	Data Users	83	3.80	1.102	0.38	0.82
	Total	353	3.91	0.972		

	EMIS Staff	25	4.20	.707		
	School principals	245	2.91	1.213		
	Data Users	83	3.33	1.170	2.98	0.02
3. EMIS data are accessible at all level & any time	Total	353	3.48	1.030		
4. Information dissemination strategies are modern and effective to address all stakeholders	EMIS Staff	25	3.36	.961		
	School principals	245	2.89	1.292		
	Stakeholders	83	2.87	1.079	1.78	0.14
	Total	353	3.11	1.111		

Key: F = actual (table) F-value = 2.95   α= level of confidence = 0.05

Mean value 1.0 - 1.49 = very low, 1.50 - 2.49 = low, 2.50 - 3.49 = medium, 3.50 - 4.49 = high, and 4.50 - 5.00

As shown from table 4.11 item 1, The mean value of respondent regarding data openness was 2.76 for EMIS staff, 2.17 for School principals & 2.47 for stakeholders. The average mean value of all groups of respondents were 2.47 and considered as low level of agreement. Moreover, the calculated F-value (2.24) is less than table value (2.95) and the mean rating comparison between the responses of respondent groups calculated ANOVA shows that p-value (0.11) which is greater than level of confidence α=0.05. This can lead to conclude that statistically there is no significant difference between the responses of respondent groups. On FGD, most of FGD members agree that there were no well-designed strategy and access to comment for external stakeholders and to react on feedbacks accordingly whereby only some concerned internal users give their personal comments to EMIS staff. Information gathered from interview of external stakeholders also reveals that they had no access to comment on the process and outputs of EMIS data. Moreover, from interview held with external education data users the main idea they raised were:

> *"There was no access to comment in order to upgrade the system as well as to comment on EMIS output, we only receive the published annual education abstract, there were no*

periodical review, no regular training on how to interpreter, manipulate and utilize the data."

According to Ashenafi (2016), feedback did not appropriately utilize in order to learn the weakness or achievement observed with all stakeholders. Most of EMIS data users were those who were aware of its existence and not open for public users. Therefore, from this finding, one can understand that, most of respondents recognize that the access of stakeholders to comment & upgrade EMIS data was low and communication between data producers and data users was very limited , the trend of giving and taking feed-back was also limited to only concerned individuals and need much improvement.

Item 2 of table 4.11 above shows that the mean value of respondent regarding the operational use of EMIS data (for planning, monitor & evaluate the education system) was 4.48.for EMIS staff, 3.80 for stakeholders & 3.45 for school directors. The overall average mean score was 3.91 which is considered as high level of agreement for all groups. On the other hand, the calculated F-value (0.38) is less than table value (2.95). and the mean rating comparison between the responses of respondent groups calculated ANOVA shows that p-value (0.82) which is greater than level of confidence α=0.05. This analysis shows that there is no significant difference between responses of respondent groups. Moreover, the interview held with Oromia Planning Commission, Oromia Bureau of Economic Co-operation & Oromia men, youth& Children's Affairs, UN agency and they revealed that:

> *"EMIS data was the basic information for strategic as well as action plan preparation, for budget decision and budget allocation of education sector, for further school age population projection, resource allocation, for monitoring long &short-term performances, to identify gender & age gap in education performance moreover, they replied that they use EMIS data as source document to prepare project proposal and presenting for funding agencies & utilize it for research purpose".*

Therefore, from this finding one can understand that data produced by EMIS was utilized by school, governmental & non-governmental organizations, Un agencies researchers and other internal and external stakeholders for operational use such as planning, monitor & evaluate the education system and other purposes.

Item 3 of table 4.11 shows that, the mean value of respondent regarding accessibility of EMIS data, was 4.20 for EMIS staff, and considered as high level of agreement, and 2.91 for school principals, and 3.33 for stakeholders and considered as medium level of agreement. The overall average mean score was 3.48 which is considered as medium level of garment for all groups. On the other hand, the calculated F-value (2.98) is greater than table value (2.95). and the mean rating comparison between the responses of respondent groups calculated ANOVA shows that p-value (0.02) which is less than level of confidence α=0.05. This analysis shows that there was significant difference between responses of respondent groups.

Moreover, the interview held with regional level stakeholders and they revealed that:

> *"EMIS data report is accessible for them through hard copy of annual education abstract report which is published one year after a fiscal year. The education abstract distributed was with minimum copy and not sufficient for different departments for reference and not accessible when needed."*

In addition, from FGD, and observation checklist the researcher observes that, forms of dissemination were inadequate for users the use of electronic database (e.g. Dashboards), website & others was not applied. Clear instructions on how to find information in the EMIS were not available to stakeholders. the schedule for data requests was not prepared for EMIS users, procedures concerning requests were not clearly defined and assistance to users were not monitored. Therefore, from this finding one can understand that there were EMIS data accessibility gap for data users.

Item 5 of table 4.11 shows that, the mean value regarding the effectiveness information dissemination strategies was 3.36 for EMIS staff, 2.89 for school principals, and 2.87 for stakeholders and considered as medium level of agreement for all groups. The overall average mean score was 3.11 which is considered as medium level of garment. On the other hand, the calculated F-value (1.78) is less than table value (2.95). and the mean rating comparison between the responses of respondent groups calculated ANOVA shows that p-value (0.14) which was greater than level of confidence α=0.05. This analysis shows that there was no significant difference of opinion among group of respondents. from FGD and observation conducted in Oromia Regional Education Bureau, zonal & woreda education offices, it was observed that

there was no written strategy document for information dissemination. The only dissemination strategy implemented recently was distribution of the soft copy & hard copy of annual education abstract. This finding was similar with the finding of German (2015) which conclude that data dissemination strategy was not recent. From the above analysis one can conclude that information dissemination strategies were not modern and effective to address all stakeholders.

4.6. Analysis by SABER EMIS Assessment Tool

This assessment tool is used by a world bank group to evaluate a countries EMIS implementation status. 110 countries over the world including some African countries implement this method to benchmark their current status. (Abdul Hamid, 2014, World Bank group) Therefore, in addition to statistical analysis tool SABER EMIS assessment tool was applied in this study. The result of the analysis is presented below.

Table 4.12 SABER Assessment Tool Result (from mean value Respondent)

Policy area	Policy level	Mean value of Respondent (5%)	Mean value of Respondent (converted to 4%)	Status /Benchmark
	Legal frame-work	2.10	1.68	Latent
	Institutional process	4.56	3.65	**Advanced**
Enabling Environment	Human resource	3.84	3.07	Established
	Infrastructural capacity	2.62	2.10	Emerging
	Budget	2.43	1.94	Emerging
	Data- Driven culture	2.56	2.05	Emerging
	Average	*3.02*	*2.42*	*Emerging*
	Data Architecture	1.84	1.42	latent
	Data coverage	4.20	3.36	Established
System soundness	Data analysis	3.16	2.70	Established
	data dynamic	2.92	2.34	Emerging
	Serviceability	3.06	2.45	Emerging
	Average	*3.04*	*2.45*	*Emerging*
	Methodological soundness	3.83	3.20	Established
Quality data	accuracy &reliability	3.26	2.80	Established
	Integrity	3.56	2.85	Established
	Periodicity &timelines	4.34	3.47	Established
	Average	*3.75*	*3.08*	*Established*

Data Utilization	Openness	2.47	1.98	Emerging
	Operational use	3.91	3.13	Established
	Accessibility	3.48	2.78	Established
	Effective in dissemination	3.11	2.49	Emerging
	Average	*3.24*	*2.60*	*Established*
Overall Average score		3.26	2.64	*Established*

Key: *1.00-1.49= Latent, 1.50-2.49 =Emerging, 2.5-3.49 =Established and 3.50-4.00 =Advanced*

Note: The meanings of "Latent", "Emerging", "Established" and "Advanced" stages are defined under sub-topic 1.7 (definition of key words) above.

From table 4.12 above, from the mean value of respondent one can understand that enabling environment was evaluated as emerging status with average score of 2.42, System soundness as Emerging with average score of 2.45, Quality data as Established with average score of 3.08 and data utilization evaluated as Established status with average score of 2.60. Generally, as assessment of respondents the status of the whole EMIS system was evaluated as 'Established' stage.

Table 4.13 SABER Assessment Result (from Researcher Rating of Document Review & Observation checklist)

Policy area	*Policy level*	*Researcher rating from Document review Observation checklist (5%)*	*Researcher rating (Converted to 4%)*	*Status /Benchmark*
Enabling Environment	Legal frame-work	1.00	0.80	Latent
	Institutional process	5.00	4.00	**Advanced**
	Human resource	3.00	2.40	Emerging
	Infrastructural capacity	3.00	2.40	Emerging
	Budget	3.00	2.40	Emerging
	Data- Driven culture	3.00	2.40	Emerging
	Average	*3.00*	*2.40*	*Emerging*
System soundness	Data Architecture	2.00	1.60	Emerging
	Data coverage	5.00	4.00	Advanced
	Data analysis	4.00	3.20	Established
	data dynamic	3.00	2.40	Emerging
	Serviceability	3.00	2.40	Emerging
	Average	*3.00*	*2.72*	*Established*
Quality data	Methodological soundness	4.00	3.20	Established

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accuracy &reliability	3.00	2.40	Emerging
Integrity	3.00	2.40	Emerging
Periodicity &timelines	4.00	3.20	*Established*
Average	*4.00*	*2.80*	*Established*

	Openness	3.00	2.40	Emerging
	Operational use	4.00	3.20	*Established*
Data Utilization	Accessibility	3.00	2.40	Emerging
	Effective in dissemination	3.00	2.40	Emerging
	Average	*3.00*	*2.61*	*Established*
Overall Average score		*3.25*	*2.63*	*Established*

From table 4.13 above, the SABER assessment result obtained from researcher rating shows that, the status of enabling environment as emerging stage, System soundness, Quality data and data usage as established stage and the whole EMIS system as 'Established' stage.

Table 4.14 SABER EMIS Assessment Result (Average score of Respondent &Researcher rating)

Policy area	Policy level	Mean value of Respondent (converted to 4%)	Researcher rating (Converted to 4%)	Average of Respondents & Researcher (4%)	Status /Benchmark
Enabling Environment	Legal frame-work	1.68	0.80	1.24	Latent
	Institutional process	3.65	4.00	3.82	Advanced
	Human resource	3.07	2.40	2.74	Established
	Infrastructural capacity	2.10	2.40	2.25	Emerging
	Budget	1.94	2.40	2.17	Emerging
	Data- Driven culture	2.05	2.40	2.22	Emerging
	Average	*2.41*	*2.40*	*2.41*	*Emerging*
System soundness	Data Architecture	1.50	1.60	1.55	latent
	Data coverage	3.36	4.00	3.67	Advanced
	Data analysis	2.70	3.20	2.95	Established
	data dynamic	2.34	2.40	2.37	Emerging
	Serviceability	2.45	2.40	2.45	Emerging
	Average	*2.47*	*2.72*	*2.60*	*Established*
Quality data	Methodological soundness	3.20	3.20	3.20	Established
	accuracy &reliability	2.80	2.40	2.60	Established
	Integrity	2.85	2.40	2.62	Established

	Periodicity &timelines	3.47	3.20	3.34	Established
	Average	*3.08*	*2.80*	*2.94*	*Established*
Data Utilization	Openness	1.98	2.40	2.19	Emerging
	Operational use	3.13	3.20	3.16	Established
	Accessibility	2.78	2.40	2.59	Established
	Effective in dissemination	2.49	2.40	2.44	Established
	Average	*2.60*	*2.61*	*2.60*	*Established*
Overall Average score		**2.64**	**2.63**	**2.64**	*Established*

Key: 1.00-1.49= Latent, 1.50-2.49 =Emerging, 2.5-3.49 =Stablished and 3.50-4.00 =Advanced

Note: The meanings of "Latent", "Emerging", "Established" and "Advanced" stages are defined under sub-topic 1.7 (definition of key words) above.

As shown from table 4.14 above, the average SABER assessment result of EMIS was 'Emerging' stage for enabling environment and 'Established' stage for System soundness, quality data and data utilization. The overall status of implementation of EMIS were evaluated as Established stage.

CHAPTER FIVE

5. SUMMARY, CONCLUSION & RECOMMENDATIONS

This chapter recaps the summary of the research objective, research methodology, the main findings, conclusion, recommendations indicates further research regarding EMIS.

5.1 Summary

Based on the data analysis major findings of the study were summarized as follows

➢ Enabling environment for the implementation of EMIS evaluated on the basis of the existence of legal framework, organizational, structure and institutionalized processes, human resources, infrastructural capacity, budget and data-driven culture. The grand mean of respondents regarding the indicators under enabling environment was 3.02 which was considered as moderate level. Gaps or problems identified under this topic were:

- Even though, EMIS is an institutionalized process in Oromia Regional State, till now there was no any written legal framework and working guideline which shows a clear accountability and responsibility of source data providers and data analysts in the regional education bureau. The implementation of modern technology was low due to the problem of network, modern technological data collection tools like web-based application, tablets, PC, Desktop computers, and other ICT infrastructures.

- Lack of budget for EMIS implementation at school level was the main challenge for production of quality data and on time production of education data.

- Absence of data-driven culture was also another challenge for the production of effective EMIS data. There was less effort of government and non-governmental organizations to promote the effective collection and utilization of data. Higher officials do not give much attention for data.

o The result of SABER Assessment tool was evaluated from (4%) and shows that, the status of Legal frame-work as "latent stage" with average score of 1.24, Institutional process as

"Advanced stage with average score of 3.82, Human resource as "Established stage " with average score of 2.74, Infrastructural capacity, existence of Budget and Data-driven culture as' Emerging stage" with average scores of 2.25, 2.17 & 2.22 respectively. Moreover, the overall status of Enabling environment for the implementation of EMIS were evaluated as "Emerging stage" with average score of 2.41 out of 4 score.

o System soundness of EMIS was analyzed through the analysis of Data Architecture, Data Coverage, Data Analytics, Dynamic System and Serviceability of data. The grand mean score of all indicators under system soundness was 3.04 and considered as moderate score. Gaps or main problems identified under this issue were:

- Regarding data architecture data management system currently functional is the ***"Three Tier data architecture***" that contains data warehouse, system manager and user interface which is internationally acceptable. However, the blueprint of the data architecture was not developed yet.

- Concerning data coverage, even though the data covers almost all of internationally accepted indicators. Financial data specially block-grant data, School inspection reports, Non-teaching staff human resource data were gaps identified and needs improvement for the future.

- Descriptive & explanatory data analysis, data tabulation, trend analysis, scenario analysis, cohort analysis, longitudinal method was the process mostly applied to analysis data. Besides, tools mostly used to perform data analysis were stat-Educ, EMIS App, Arc GIS software, percentage & mean value. The output of the analysis was displayed through, basic tables and graphs with narration. From this finding one can conclude that most of internationally accepted methods of data analysis was applied. But for the future it needs more modern web-based data analysis techniques.

- The current system can't collect data automatically and can't produce report by itself, and non-dynamic which is not elastic and can't easily adaptable to allow for changes to provide solutions to emerging needs including advances in technology. Data is collected manually and report is produced using excel sheet. This have

negative implication on quality & timeliness of data produced. Thus, system adaptability needs improvement for the future.

- Multiple years of data were archived at regional as well as zonal level however, it was not in the same manner at woreda and school level. And needs great attention.

- Administrative school census data, human resource data, student achievement data & financial data were compiled together as one document and the report of their finding was disclosed at the same time and not customized as users need.

o The result of SABER EMIS Assessment from (4%) shows that, the status of Data Architecture were evaluated as "latent stage" with average score 1.55, Data coverage as "Advanced stage" with average score of 3.67, Data analysis system as "Established stage" with average score of 2.95, data dynamic as "Emerging stage" with average score of 2.37 and serviceability of the data as "Emerging stage" with average score of 2.45. Moreover, the overall system soundness was evaluated as "Established stage" with average score of 2.60 out of 4 score.

o As it is mentioned by World Bank, 2014, Indicators of quality data includes: Methodological soundness, Accuracy and reliability, Integrity, Periodicity and timeliness. The grand mean score of all indicators under this issue was 3.75 which was considered as high level of agreement. The main challenge or gaps identified under quality data were:

- Lack of specific reference for recording age of students at school level and absence of school management information system (SMIS) at school level as main challenge and basic cause for unreliability of EMIS data. From document review, a researcher investigates that the value of primary education net enrolment rate (NER) of most zones and administrative towns was above 100% this is contradicting with the reality that NER can't exceeds 100%. which was connected to the problem of school age population projection

- Gaps observed regarding the issue of transparency and ethical standard. Was, even thought, EMIS staff follows clear standards of good conduct those standards were not well defined and clear to both internal & external stakeholders. The term under which statistical data was collected, processed and disseminated were not clearly transparent and available to the public.

- With a timeliness of data report, it was observed that, unpublished quick abstract (data on excel sheet) is produced and distributed for internal users at the middle of each academic year, the education statistics annual abstract is analyzed, printed and distributed one year after a fiscal year, constantly every year. However, regarding periodicity the gap observed was that, the production of reports and other outputs from the data warehouse was not in accordance with cycles rather administrative school census data, learning outcome & financial reports were produced together once a year. learning achievement surveys were not conducted according to the regional monitoring needs.

o The result of SABER EMIS Assessment tool from (4%) shows that, all the components under quality data, that is, Methodological soundness, accuracy &reliability, Integrity as well as Periodicity &timelines were evaluated as "Established Stage" with average score of 3.20, 2.60, &2.62 & 3.34 respectively. In the same manner, the overall system of quality data was evaluated as "Established Stage" with average score of 2.94 out of 4 score.

o EMIS data is utilized by different internal and external users to make decision as at different level. Accurate information on education sector performance enable decision makers to make informed decision. As (world bank EMIS framework 2014) Indicators for EMIS data utilization includes data openness for users, data usage for operational use, data accessibility & dissemination effectiveness. The grand mean score of indicators of data utilization was 3.24 and considered as moderate level of agreement. gaps and problems identified under this issue were:

- Most of EMIS data users were only those who were aware of its existence and it was not open for public users access of stakeholders to comment & upgrade EMIS data was low and communication between data producers and data users was very limited, the trend of giving and taking feed-back was also limited to only concerned individuals.

- Forms of dissemination were inadequate for users the use of electronic database (e.g. Dashboards), website & others was not applied. Clear instructions on how to find information in the EMIS were not available to stakeholders. The schedule for data requests was not prepared for EMIS users, procedures concerning requests were not

clearly defined and assistance to users were not monitored, Therefore, from this finding one can understand that there were EMIS data accessibility gap for data users.

- There was no written strategy document for information dissemination. The only dissemination strategy implemented recently was distribution of the soft copy & hard copy of annual education abstract. From this analysis one can conclude that information dissemination strategies were not modern and effective to address all stakeholders.

o The result of SABER EMIS Assessment tool from (4%) shows that, Openness of data was evaluated as "Emerging Stage" with average score of 2.19 were as Usage of data for Operational use, Accessibility of education data, Effectiveness in dissemination were evaluated as "Established Stage " with average score of 3.16, 2.59 and 2.44 respectively. The overall system of data utilization was evaluated as "Established Stage" with average score of 2.60 out of 4 score.

5.2. Conclusions

Based on the objectives of the study, the following conclusions are presented:

- ❖ From the above analysis it can be concluded that the status of enabling environment for implementation of EMIS in Oromia Regional State was at an emerging stage according to the SABER EMIS Assessment tool. And needs great attention while it is a base for effectiveness of the whole system.

- ❖ Regarding EMIS data soundness, from the analysis and interpretation of data its status was considered as an Established stage as SABER Assessment tool. The data covers almost all performance indicators of education system; however, it needs improvement for modern technology which collect, analyze and produce report by itself.

- ❖ The status of quality of EMIS data was analyzed as an 'Established Stage' according to SABER Assessment tool. From the above analysis it was observed that data recording systems follow internationally accepted standards and methodologically sounds. Defined education system classification such as ownership of school, level of school & location of schools are in place. However, to improve the accuracy, reliability & integrity it needs modern quality assurance techniques.

❖ The status of data utilizing was also analyzed as an 'Established stage'. From the above analysis it was observed that, data produced by an EMIS is used for operational use and helps for planning, monitor & evaluate the education system by most of internal and external stakeholders, More over data produced by EMIS was utilized at regional, zonal & woreda level more efficiently than at school level. Annual education abstract was distributed for current EMIS stakeholders regularly. On the other hand, lack of access for comment upgrading of data, limited type of data dissemination strategy, absence of trend of providing feed-back with regard to the statistical outputs needs improvement.

❖ As a conclusion, based on a SABER EMIS assessment tool of World Bank group, 2015 the overall status of EMIS implementation in the Oromia regional state can be concluded as 'Moderate level or Established stage' with average mean value of 2.64 out of 4 score. Which shows basic enabling environments are in place, some process exists but the system is not modernized, not fully integrated, not adaptable to change. Most mechanisms to collect, save and produce quality data were in place but some additional measures are needed to ensure accuracy, reliability, timelines, used by most stakeholders with limited dissemination strategy data is not open as needed & lacks customization as users need. The policy at this stage should address. Legal-frame work with accountability & responsibility, Modern web-based technology of data collection, analysis & dissemination of quality data in time line.

5.3. Recommendations

Based on the major findings of the study and conclusion drawn the researcher forwarded possible recommendations as follows:

▶ Ineffective institutional frameworks, leadership and management cause inefficiencies and contribute to the deterioration of trust in the regional education statistical reports. Oromia Education Bureau must have legal framework with a clear legal mandate to collect information from all education and training institutions and bodies, produce specific work guidelines for EMIS staff. Further, the Bureau should give great attention to

accountability & responsibilities issues regarding collection of quality data and production of reliable information.

► Higher officials should give great attention for education data and data-driven culture. The bureau should prepare different strategies to improve data literacy.

► The bureau should shift data collection techniques from manual to modern web-based application and online technology by supplying necessary ICT materials, internet access & infrastructures at all level including schools. Moreover, data analysis system should be modernized and the existing system should be upgraded to new web-enabling system which can produce report by itself and has a data security system as well as system adaptability.

► Responsible person should be assigned at school level for school data management. Application of school management information system (SMIS) is also vital for effectiveness of EMIS implementation.

► The data architecture of EMIS is well defined to ensure full system functionality it is a process that prescribe how data is stored in and processed from database. Therefore, data architecture and it's blue-print should be prepared and implemented in the region.

► To improve serviceability of EMIS data and make it attractive and timely available the statistical report should be customized to users need at local, regional area & donors need, the statistical report should be divided in to different categories and time table so that everybody can access the data easily.

► Based on this finding and international experience, the administrative school census statistical data, learning achievement survey and financial statistics with human resource data that includes teaching and non-teaching staff should be produced separately and at different time table.

► Since education data has budget implication missing number of students, number of teaching & non-teaching staff may cause budget unbalance and wastage. To improve education data quality, beside data validation and data verification the bureau should provide internationally accepted quality assurance management approaches such as (ISO 9000, total quality management). The age of students should be recorded from specific & acceptable reference and schools should establish a strong partnership with local level

vital data registration agency. Multiple years of data should be archived at woreda & school levels.

► To improve data utilization status, the bureau should have to shift 'from data control to data share' EMIS stakeholders should be identified, aware of EMIS data and its output, provided regular training on how to interpret, manipulate & utilize the data. Moreover, EMIS data producers should develop a strategy to collect feed- back from stakeholders to improve quality of data.

► Information dissemination strategies should be developed in a way it should be accessible at any time and all place and include leaflets, newsletters, and downloadable internet documents through the regional education bureau website & others.

5.4.   Limitation and recommendation for future study

The major challenge faced a researcher during conducting this study was the emerging of COVID-19 and since schools were shut down and some questioners were not returned back after a lot of effort 92. 9% were collected. Moreover, the schools & woreda education offices planed for FGD and observation were minimized to 50%. The researcher would like to recommend that further researches need to be conducted on the effect of variable such as educational background, field of specialization & age of EMIS data producers on the effectiveness of EMIS data and the status of EMIS implementation with regard to schools' level, ownership & location.

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Appendices

Appendix A

Questionnaire to be filled by **EMIS Staff** at OEB-(Oromia Education Bureau, ZEO-(Zonal Education Office) & WEO- (Woreda Education Office)

Jimma University College of Business & Economics
Addis Ababa, ABH Campus

Respondents Consent Letter

Dear Respondent, I am an MA student conducting thesis research on the topic entitled "Assessment of EMIS (*Education Management Information System),* Implementation in Oromia Regional State". Hence, I would like to express my heart-felt appreciation and respect for your precious time and sincere cooperation, in advance, to fill this questionnaire. The purpose of this study is aimed at improving the education management information system practice in Oromia Regional state. The findings of the study will be used for planning, monitoring & evaluation of ESDP (*Education Sector Development Program),* goals and improving the quality of education in the region. Your participation in this research is completely voluntary &the success of the study will depend on the quality of your responses. Therefore, you are kindly requested to give accurate and honest information timely. Your response will be kept confidential and used only for academic purpose.

General Directions:

In any part of the questionnaire, you are not advised to write your name.

Put check mark only "√" mark against your most appropriate answer for close-ended questions,

As much as possible please do not leave the questions unanswered. Please, give adequate answer on the space provided briefly for open-ended questions.

Thank you very much for your cooperation.

Wubnesh Mati

Part-I

Personal information

1. Place of Work: REB ☐ ZEO ☐ WEO ☐
2. Sex Male ☐ Female ☐
3. Age Below 30 ☐ 31-35 ☐ 36-40 ☐ 41-45 Above 45 ☐
4. Educational Qualification

   Diploma graduate ☐ Second Degree ☐

   First Degree ☐ PhD ☐

5. Subject of specialization EDPM ☐ ICT ☐
   Statistics ☐ Others subject ☐
6. Over all Work experience in years:

   0-5 ☐ 6-10 ☑ 11-15 ☐ 16-20 ☐ above **20** ☐ ☐

7. Position: Team leader ☐ Expert

Part II. Status of Implementation of EMIS

I.   **Existence of Enabling Environment for EMIS Implementation**

Please indicate your level of agreement on **existence** of enabling conditions for implementation of EMIS *by* putting thick mark "✓" for one of the given options (**1= not exist 2= rarely exist; 3= partially exist; 4= mostly exist, 5= fully exist**)

N0	Activities	Degree of agreement				
		1	2	3	4	5
1.1	Existence of legal- framework for EMIS Implementation					
1.2	Existence of organizational structure and institutionalized processes					
1.3	Existence of qualified and sufficient human resources					
1.4	Existence of modern technology & Infrastructural capacity to implement EMIS.					
1.5	Existence of necessary budget for EMIS implementation					
1.6	Existence of data-driven Culture					

1. If enabling Environment for implementation of EMIS is insufficient what are the basic gaps?

_____

_____

_____

_____

_____

II.   System Soundness

Please indicate your level of agreement on system soundness *by* putting thick mark "✓" for one of the given options (**1= Strongly Disagree, 2=Disagree, 3=Undecided, 4=Agree, 5= Strongly Agree**)

No	Activities	Degree of agreement				
		1	2	3	4	5
2.1	EMIS data architecture is exist and fully implement					
2.2	The data covers all performance indicators of education system..					
2.3	Scientific methods of data analysis are implemented					
2.4	The system is dynamic and easily adaptable to allow changes					
2.5	Data collection instruments are carefully designed & easily serviceable					

1. If there is any gap between internationally accepted education management information system and the actual ones in Oromia region please indicate some basic gaps.

_____

_____

_____

_____

_____

2. Do you think EMIS data covers all necessary information regarding quality, equity, access& internal efficiency? --------------------------
If not, please explain some basic indicators which should be included?

_____

_____

_____

_____

III.   Quality of EMIS Data

Please indicate your level of agreement on quality of EMIS data *by* putting thick mark "✓" for one of the given options **(1= Strongly Disagree, 2=Disagree, 3=Undecided, 4=Agree, 5= Strongly Agree)**

No	Activities	Degree of agreement				
		1	2	3	4	5
3.1	Data recording systems follow internationally accepted standards and methodologically sounds					
3.2	Source data, statistical techniques and outputs are accurate & describe reality.					
3.3	There is integrity & public trust regarding EMIS data output					
3.4	The administrative school census is conducted within a given period & timeline					

1. Is age of students recorded according to a specific reference period and/or date? _____
If your response is yes, what is your reference for recording ages of students?

_____

_____

2. Is there any data validation techniques implemented? ----------------------------
If yes, please write down some of them. _____

_____

_____

_____

3. Explain the existing trend in the region regarding timeliness and schedule for data dissemination?

_____

_____

_____

IV.   Data Utilization for Decision Making

Please indicate your level of agreement on data utilization *by* putting thick mark "✓" for one of the given options (**1= strongly Disagree, 2=Disagree, 3=Undecided, 4=Agree, 5= Strongly Agree**)

No	Activities	Degree of agreement				
		1	2	3	4	5
4.1	EMIS data is open and Stakeholders have an access to comment in order to upgrade it.					
4.2	Data produced by an EMIS is used for operational use and helps for planning, monitor & evaluate the education system.					
4.3	EMIS data are accessible at all level & any time.					
4.4	Information dissemination strategies are modern and effective to address all stakeholders.					

1. Are EMIS data users/stakeholders are identified and aware of EMIS and its out puts? If your answer is yes, Write some of EMIS stakeholders in the region

    _____

    _____

    _____

2. Is there a regular training to current EMIS users on how to interpret, manipulate, and

    utilize the data**?**_____ If your answer is yes, explain the schedule & some

    topics of the training_____

_____

_____

3. Do EMIS users have provide feedback with regard to the statistical   outputs?

If your answer is yes, what is the strategy they use to give the feedback?

_____

_____

_____

General comment
If you have other additional comments regarding EMIS, pleased specify in the space provided.

_____

_____

_____

_____

_____

Thank you for your Cooperation and your inputs for this study.

Jimma University College of Business & Economics
Addis Ababa, ABH Campus

Respondents Consent Letter

Dear Respondent, I am an MA student conducting thesis research on the topic entitled "Assessment of EMIS (*Education Management Information System)* Implementation in Oromia Regional State". Hence, I would like to express my heart-felt appreciation and respect for your precious time and sincere cooperation, in advance, to fill this questionnaire. The purpose of this study is aimed at improving the education management information system practice in Oromia Regional state. The findings of the study will be used for planning, monitoring & evaluation of ESDP (*Education Sector Development Program*) goals and improving the quality of education in the region. Your participation in this research is completely voluntary &the success of the study will depend on the quality of your responses. Therefore, you are kindly requested to give accurate and honest information timely. Your response will be kept confidential and used only for academic purpose.

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Put check mark only "√" mark against your most appropriate answer for close-ended questions,

As much as possible please do not leave the questions unanswered. Please, give adequate answer on the space provided briefly for open-ended questions.

Thank you very much for your cooperation.

Wubnesh Mati

Part-I

Personal information

1. Zone/Administrative Town_____
2. Woreda _____
3. Level of school   Primary ☐   Secondary ☐
4. School ownership   Public ☐   Privet ☐   NGO ☐ Community ☐
5. School Location   Urban ☐   Rural ☐
6. Sex   Male ☐   Female ☐
7. Age   Below 30 ☐   31-35 ☐   36-40 ☐   41-45   Above 45 ☐
8. Educational Qualification

   TTI / certificate ☐   First Degree graduate ☐

   Diploma graduate ☐ 2nd Degree (MA, MSc) graduate   PhD. ☐

   Other, please specify _____

9. Subject of specialization   EDPM ☐   Others subject ☐
10. Over all Work experience   in years:

   0-5 ☐   6-10 ☐   11-15 ☐   16-20 ☐   above **20** ☐

11. Your current Position:
        Schools principal   ☐
        Vice principal   ☐

Part II. Status of Implementation of EMIS

     I.   **Existence of Enabling Environment for EMIS Implementation**

Please indicate your level of agreement on existence of enabling conditions for implementation of EMIS *by* putting thick mark "✓" for one of the given options (**1= not exist 2= rarely exist; 3= partially exist; 4= mostly exist, 5= fully exist)**

N0	Activities	Degree of agreement				
		1	2	3	4	5
1.1	Existence of modern technology & Infrastructural capacity to implement EMIS.					
1.2	Existence of necessary budget for EMIS implementation					
1.3	Existence of data-driven Culture					

1. If enabling Environment for implementation of EMIS is insufficient what are the basic gaps?

_____

_____

_____

_____

2. What technology do you use to collect and store data at school level?

_____

_____

_____

II. System Soundness

Please indicate your level of agreement *by* putting thick mark "✓" for one of the given options **(1= Strongly Disagree, 2=Disagree, 3=Undecided, 4=Agree, 5= Strongly Agree)**

No	Activities	Degree of agreement				
		1	2	3	4	5
2.1	The data covers all performance indicators of education system.					
2.2	Data collection instruments are carefully designed & easily serviceable					

1. If there is any gap between internationally accepted education management information system and the actual ones in Oromia region please indicate some basic gaps.

_____

_____

_____

_____

_____

2. Do you think EMIS data covers all necessary information regarding quality, equity, access& internal efficiency? --------------------------
   If not, please explain some basic indicators which should be included?

   _____

   _____

   _____

   _____

III. Quality of EMIS Data

Please indicate your level of agreement on quality of data *by* putting thick mark "✓" for one of the given options **(1= Strongly Disagree, 2=Disagree, 3=Undecided, 4=Agree, 5= Strongly Agree)**

No	Activities	Degree of agreement				
		1	2	3	4	5
3.1	Data recording systems follow internationally accepted standards and methodologically sounds					
3.2	Source data, statistical techniques and outputs are accurate & describe reality.					
3.3	There is integrity & public trust regarding EMIS data output					
3.4	The administrative school census is conducted within a given period & timeline					

1. Is age of students recorded according to a specific reference period and/or date? _____

   If your response is yes, what is your reference for recording ages of students?

   _____

   _____

2. Is there any data validation techniques implemented? ----------------------------

   If yes, please write down some of them. _____

   _____

   _____

   _____

3. Explain the existing trend in the region regarding timeliness and schedule for data dissemination?

_____

_____

_____

IV. Data Utilization for Decision Making

Please indicate your level of agreement on data utilization **by** putting thick mark "✓" for one of the given options (**1= strongly Disagree, 2=Disagree, 3=Undecided, 4=Agree, 5= Strongly Agree**)

No	Activities	Degree of agreement				
		1	2	3	4	5
4.1	EMIS data is open and Stakeholders have an access to comment in order to upgrade it.					
4.2	Data produced by an EMIS is used for operational use and helps for planning, monitor & evaluate the education system.					
4.3	EMIS data are accessible at all level & any time.					
4.4	Information dissemination strategies are modern and effective to address all stakeholders.					

1. Do school community, parents & Clients use EMIS data? If your answer is yes, explain some basic purposes they utilize?

_____
_____
_____

2. Do you get annual education abstract regularly**?**

If your answer is yes**,** from where do you get document? (Regional Bureau, zonal or Woreda Offices)

_____

_____

_____

General comment

If you have other additional comments regarding EMIS, pleased specify in the space provided.

_____

_____

_____

_____

_____

Thank you for your Cooperation and your inputs for this study.

Questionnaire to be filled by EMIS stakeholders

Jimma University College of Business & Economics
Addis Ababa, ABH Campus

Questionnaire to be filled by **OEB** (Oromia Education Bureau)**, ZEO** (Zonal Education Office), **WEO** (Woreda Education Office), **CTE** (College of Teachers Education) and other regional & local **governmental & non -governmental EMIS stakeholders.**

Respondents Consent Letter

Dear Respondent, I am an MA student conducting thesis research on the topic entitled "Assessment of EMIS (*Education Management Information System),* Implementation in Oromia Regional State". Hence, I would like to express my heart-felt appreciation and respect for your precious time and sincere cooperation, in advance, to fill this questionnaire. The purpose of this study is aimed at improving the education management information system practice in Oromia Regional state. The findings of the study will be used for planning, monitoring & evaluation of ESDP (*Education Sector Development Program),* goals and improving the quality of education in the region. Your participation in this research is completely voluntary &the success of the study will depend on the quality of your responses. Therefore, you are kindly requested to give accurate and honest information timely. Your response will be kept confidential and used only for academic purpose.

General Directions:

In any part of the questionnaire, you are not advised to write your name.

Put check mark only "√" mark against your most appropriate answer for close-ended questions,

As much as possible please do not leave the questions unanswered. Please, give adequate answer on the space provided briefly for open-ended questions.

Thank you very much for your cooperation.

Wubnesh Mati

Part-I

Personal information

1. Organization   Education Bureau ☐   Other Government Bureau ☐   NGO ☐
2. Name of your organization _____
3. Place of Work   Regional ☐   Zonal ☐   Woreda ☐   CTE ☐
4. Sex   Male ☐   Female ☐
5. Age   Below 30 ☐   31-35 ☐   36-40 ☐   41-45 ☐   Above 45 ☐
6. Educational Qualification
         Diploma graduate ☐ 2nd Degree (MA, MSC) ☐
         First Degree (BA/BSC) ☐   PhD ☐
7. Subject of specialization   EDPM ☐   Others subject ☐
8. Over all Work experience   in years:
   0-5 ☐   6-10 ☐   11-15 ☐   16-20 ☐   above **20** ☐
9. Experience in current position
   0-5 ☐   6-10 ☐   11-15 ☐   16-20 ☐   above **20** ☐
10. Profession,   Planner ☐   Other profession ☐

11. Position: Director ☐   Team leader ☐   Expert ☐

Part II. Status of Implementation of EMIS

1. Data Utilization for Decision Making

Please indicate your level of agreement on data utilization *by* putting thick mark "✓" for one of the given options (**1= strongly Disagree, 2=Disagree, 3=Undecided, 4=Agree, 5= Strongly Agree**)

No	Activities	Degree of agreement				
		1	2	3	4	5
4.1	EMIS data is open and Stakeholders have an access to comment in order to upgrade it.					
4.2	Data produced by an EMIS is used for operational use and helps for planning, monitoring & evaluating the system.					
4.3	EMIS data are accessible at all level & any time.					
4.4	Information dissemination strategies are modern and effective to address all stakeholders.					

1. As an EMIS data users/stakeholders are you aware of EMIS and its outputs?
   If your answer is yes, please explain the mechanisms by which you receive education data outputs.

   _____

   _____

   _____

2. Is there a regular training given to you on how to interpret, manipulate, and utilize the data? If your answer is yes, write down some of the topics you are trained on.

   _____

   _____

3. Do you ever provide feedback to EMIS data producers with regard to the statistical outputs?

   If your answer is yes, how many times do you provide the feedback?

   _____

   _____

4. Do you think EMIS data covers all necessary information you need?
   If not, what do you recommend to be included?

   _____

   _____

   _____

5. Do you get annual education abstract regularly?
   If your answer is yes, from where do you get it (Regional Bureau, zonal office or Woreda Office?)

   _____

   _____

General comment
If you have other additional comments regarding EMIS, pleased specify in the space provided.

_____

_____

_____

_____

_____

Thank you for your Cooperation and your inputs for this study.

Interview Guide

Jimma University College of Business & Economics

Addis Ababa, ABH Campus

Interview Guide prepared for planners of EMIS external stakeholders at regional level (Oromia Plan Commission, Oromia Bureau of Finance & Economic Cooperation and Oromia women, youth& Children affairs Bureau)

1. Do you know about EMIS?
2. Would you tell me some of its outputs?
3. Do you use EMIS data? To what extent do you use it?
4. For what purpose do you use it?
5. How do you get the EMIS report?
6. Do you think the data covers all your needs? As your opinion what should be included?
7. Is the report accessible on time?
8. What is your opinion about the quality of the data?
9. Source data and statistical techniques are sound and reliable and statistical outputs sufficiently describe reality.
10. Are the terms and conditions under which statistics are collected, processed, and disseminated are open to the public?
11. Do you get any orientation or training regarding EMIS data interpretation, manipulation & utilization?
12. Do you periodically review the contents of existing statistical reports and identify any emerging data requirements?
13. Have you ever give feed-back to EMIS and ICT directorate about the data they provide? For how many times you contribute a feed-back?

Thank you very much for your cooperation!!

Observation Checklist

1. Observation Checklist For REB, ZEO &WEO

Date_____

No.	Item	Degree of Availability				
		5	4	3	2	1
1.	**Enabling Environment**					
1.2	EMIS Legal Framework					
1.2	Structure (HR)					
1.3	Guideline					
1.4	Operations manuals					
1.5	EMIS staff qualification					
1.6	EMIS staff professional development &training programs					
1.7	Data collection tools					
1.8	Database & Data warehouse					
1.9	Data management System					
1.10	Computer					
1.11	ICT Gates					
	Internet access					
1.12	Annual Budget for EMIS (Amount & Source of budget)					
2	**Data Processing, Management, Dissemination & Usage**					
2.1	Data architecture and blue print					
2.2	Record keeping Directory					
2.3	Annual Abstract & Hand book					
2.4	Data dissemination strategy					
2.5	Data Users profile					
2.6	Stakeholders feedback document					
2.7	Stakeholders training schedule or document					

2. Observation Checklist for School

Date_____

No.	Item	Degree of Availability				
		5	4	3	2	1
1.	**Enabling Environment**					
1.1	Guideline					
1.2	Operations manuals					
1.3	Data collection tools					
1.4	Data management System					
1.5	Computer					
1.6	ICT Gates (Fax, printer…)					
1.7	Internet access					
1.8	Annual Budget for EMIS (Amount & Source of budget)					
2	**Data Processing, Management, Dissemination & Usage**					
2.1	Record keeping Directory					
2.2	Annual Abstract & Hand book					
2.3	Data dissemination strategy					
2.4	Data Users profile					
2.5	Stakeholders feedback document					
2.6	Stakeholders training schedule or document					

Appendix F
Focus Group Dissection (FDG) Guiding Questions

1. What are the existing enabling conditions and gaps for EMIS implementation in Oromia Regional State regarding to:

   - Legal farm-work
   - Mandate
   - Responsibility
   - Technology
   - Human resource
   - Budget
   - Data -driven culture

2. What are the basic methodology you use for:-

   - Data Collection
   - Data Analysis
   - Reporting the Output

3. What do you think about the quality of EMIS data?

   - Are Source data, Statistical techniques & Outputs describes reality?
   - What kind of statistical document you produce and disseminate to users?
   - What is the time line & schedule for dissemination of statistical outputs?

4. For what purpose does data produced used?

   - Effective in dissemination strategy
   - EMIS data producers & data users' relationship
   - Standardization
   - Customization
   - Assistance given to stakeholders
   - Trend of giving feedback