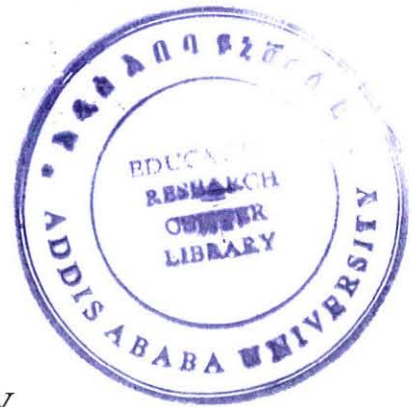


**THE PRACTICES AND PROBLEMS OF EDUCATION  
INFORMATION SYSTEM (EIS) MANAGEMENT  
IN OROMIA**

**BY  
MEKONNEN KEJELA**



**ADDIS ABABA UNIVERSITY  
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POLICY AND PLANNING**

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## Acronyms and Abbreviations

ADEA	Association for Development of Education in Africa
ANOVA	Analysis of Variance
CSA	Central Statistical Authority
DEFDO	District Economic and Finance Development Office
DEO	District Education Office
EFA	Education for All
EMIS	Education Management Information System
FGD	Focus Group Discussion
IIEP	International Institute for Educational Planning
JICA	Japan International Cooperation Agency
MDG	Millennium Development Goals
MOE	Ministry of Education.
OEB	Oromia Education Bureau
PTA	Parent-Teacher Association
SDPRP	Sustainable Development and Poverty Reduction Program
TGE	Transitional Government of Ethiopia
UNESCO	United Education, Social and Cultural organization.
UPE	Universal Primary Education
ZED	Zone Education Department
ONRS	Oromia National Regional State
WEF	World Education Forum
GM	Grand Mean

## *Abstract*

*This descriptive study was sought to examine the practices and problems of EIS management in Oromia. The study areas incorporated 64 schools, 16 districts, 6 zones, 2 city administrations and OEB, which were sampled through stratified random sampling and Simple random sampling techniques. Out of these areas, 20 OEB EMIS staff, 16 ZED statisticians, 34 DEO statisticians, 72 school principals were included in the study on purpose. Overall, out of 142 intended respondents for the questionnaire 128(90.14%) were actually participated in the study. Besides 11 interviewees – 2 from OEB, 3 from ZED, 3 from DEO and 3 from schools were the subject of the study. Moreover, 20 PTA members from three schools were also the discussion group for the study. To achieve what the study purported to attain and gather data from the respondents questionnaires, coupled with interview, focus group discussion (FGD), and document analysis were utilized. The data obtained were tabulated, analyzed and interpreted using the descriptive method. The data were statistically treated using frequency counts, percentages, standard deviation, rank order correlation coefficient, the chi-square test, t-test and one-way classification of ANOVA. The result of the study indicated that EMIS had been conceptualized as data gathering devices from the field to inform decisions at national level. Hence, EMIS functions were limited to data gathering at schools, to summarizing at DEO and ZED. The EMIS does not include all aspects of education. Mainly data/information about educational processes and outputs was rarely existed in EMIS. Besides, qualitative aspects of education never appeared in the system. The quantitative ones dominate the approach. The available EMIS outputs were underutilized in areas like planning, monitoring, development of projects and programs, and allocating resources particularly at schools, DEO, and ZED. The demand and utilization of EMIS outputs were found to be low at lower levels. Moreover, the EMIS outputs of the region appeared to be low in quality in terms of accuracy, presentation and timeliness. Overall, the EMIS of the region suffered from human and material capacity constraints. The conclusion is thus, EIS management of the region is not effective to serve the functions it intends to serve. Therefore, the researcher recommended OEB, ZED, DEO, and schools to act on redesigning EMIS to make it demand driven supply net work, on the development of demand and utilization of EMIS outputs on the part of users, and on capacity building activities.*

# CHAPTER ONE

## 1. The Problem and Its Setting

This chapter introduces concepts of education management information system (EMIS), the statement of the problem, objective of the study, significance of the study, limitations of the study, delimitation of the study, and the organization of the study.

### 1.1. Background

Oromia National Regional State (ONRS) was established as a regional government in 1992 as per the proclamation no.7/1992, which was issued to establish national regional self governments in the country (TGE, 1992). It extends from 3° 24' 20' N to 10° 23'26'N and from 34° 7'37 to 42°58' 51' E. The region is one of the largest regions with a population of about 25.5 million and total land area of 363,136 square kilometer. It accounts for about 33.5% of the population and 34.3 percent of the country's total land area and contiguous with all but one regional state-Tigray (ONRS, 2000).

Oromia is the most populous region in the country. It runs first both in terms of size and population. The Agriculture sector contributed the lions share accounting for about 66.7% of the total RGDP followed by service and Industry. Education sector is among the service giving sectors of the region managed by Oromia Education Bureau (OEB) (ONRS, 2000).

In the region there are about 9325 primary and 386 secondary schools. In these schools, there are 585,837 students and 99,147 teachers. Coverage wise 82, 14, 2.3 percent of the primary, general secondary, preparatory school age population have the chance of schooling in the region(OEB, 2007/8).It could be said that there has been a rapid expansion of education in the region since 1991. Besides the Region's education system has been developed to a gigantic level implying the need for sophisticated management (OEB, 2009).

Many years of research have provided clear evidences that education is a key factor to the growth and development. However, how to maximize student learning in educational systems with limited resources remains one of the greatest educational challenges. This initiated countries to have a constant monitoring and evaluation of the learning system in education by collecting and examining data and information used in the process of educational decision making.

Data driven decision making in the management of the education system has as its goal increased access, efficiency, effectiveness, equity and quality of education through effective systems of monitoring and evaluation, budgeting and planning. EMIS enable these informed decisions to be made by providing necessary data and information and by fostering an environment in which the demand for this information drives its use. Hence, the production of educational data is the corner stone on which the information based decision-making framework is built.

The problems of access, equity, quality, and relevance in education can be addressed using various approaches each requiring a decision support system. To enable the policy and decision makers determine the seriousness of these problems, the magnitude and extent of education services needed, the realistic amount of resource to deliver these services efficiently and effectively; they must have accurate reliable and timely information on the state of education in the country. To the contrary, there had been the dearth of empirical data generated through a functional and carefully designed system. Consequently, the need for an EMIS became an indispensable reality in education system. EMIS is, therefore, relatively a new concept that arose from the need to embark into more coordinated form of management of education (Tegegn, 2003).

To survive, therefore, educational organizations must have a strong EMIS, which is responsible for information system activities ranging from collection through processing to dissemination and utilization. This system provides relevant, complete, accurate and current information to decision makers, planners and educators. In support of this idea Chapman and Mahlck(1993) have noted that improving educational practice requires that decision makers have access to relevant, accurate and timely data. It seems with this premise that Wilson (2005) concluded that the information system is the nervous system that allows an organization to respond to opportunities and avoid threats.

Carrizo, Sauvageuts and Bella (2003) also have highlighted that, the setting up of or the strengthening of an information system is based on the simple premise: all systems, all organizations whatever they might be have to produce information to inform on their condition, their functioning and their results. With out data no system can function rationally and consequently no operational decision can be taken. In a study by Chapman and Mahlck(1993) it

has been suggested that a priority in many initiatives to improve the quality and efficiency in the third world countries is the increased use of information in policy formulation and planning.

The most broadly supported comprehensive and specific MDGs that the world has ever agreed upon and time bounded goals provide concrete numerical bench marks. The eight MDGs break down into over 21 quantifiable targets that are measured by over 60 indicators. Out of the eight development goals the second goal is concerned with universal primary education. Different national and international associations, organizations, agencies, and countries of the world have been striving a lot towards achieving the promises by designing targets and strategies. On the World Education Forum(WEF) in Dakar, Senegal for instance, participants have committed themselves to achieve EFA goals, and they pledged themselves to many strategies, of which to harness new information and communication technologies to help achieve the goals was the one. They agreed up on the need to tap the potential of ICT to enhance data collection, analysis, and to strengthen information management systems from central ministries through sub-national levels to schools. Besides, they emphasized that robust and reliable statistics, disaggregated, and based on census data, are essential if progress is to be measured, experience shared and lessons learned (WEF, 2000).

The Government of the Federal Democratic Republic of Ethiopia (FDRE) and its Ministry of Education also (MOE) launched the National Education and Training Policy(ETP) in1994.To translate the objectives of the policy into action the government initiated a twenty year education sector indicative plan (ESDPs) that included national priority areas and MDG - EFA goals and strategies. The main goal of the plans was to improve educational quality, equality, and relevance with special emphasis on achieving Universal primary education by 2015, which is one of the MDGs. The strategies and the programs are being put into operation both at national, regional, and local levels. The most important management tool indicated in the program action plan for monitoring, review, and evaluation was to have adequate, relevant, accurate, timely and useful strong EMIS data/information. The overall purpose of having such data/information as indicated in the document was to asses whether implementation is proceeding according to the plan, to compare actual achievements to the target set and to learn from past implementation to improve performance in the future (MOE, 1999; MOE, 2002; and MOE, 2005).

Since conditions and experiences differ across regions and localities, identifying the problems of the achievements of the targets and tracking the progress by various interventions and adjustments have been through a practical indication of data/information. Moreover, providing relevant information for more evidence based policy making, further planning, and more effective program implementation require gathering and processing reliable data/information. Over all program success or failure; further planning and decision making all are supported by EMIS data/information. It was with these premises that the need for functional EMIS has long been recognized in the ESDPs (I-III) program action plan for monitoring, review and evaluation.

Hence, EMIS has a pivotal role in the management of education and in the achievement of MDGs, EFA, and ESDPs.

Therefore, assessing the practices and problems of EIS management in Oromia is the focus of this paper to examine what is on the ground regarding EMIS functions, EMI availability, EMI utilization and EMI quality and come up with some plausible recommendations.

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

With any educational institution one of the crucial factors in organization and management of resources-perhaps the most crucial factor is information. One must have information on the elements that make up the totality management. To indicate the importance of information Tucker (1979) has quoted that "That which is not known can't be controlled" (p.39). Besides, the availability of reliable and up to date educational statistics is essential not only for formulation of policies and educational planning, but also taking information-based decisions on many problematic issues in day-to-day administration of the educational system. It has been with this ground that there has been a growing recognitions that improving the quality of education for all students in countries will require the provision of more relevant, reliable; Unambiguous and timely data and information than has been the case in the past.

The increasing demands for more analytical information have been given momentum by a number of significant recent trends in both developed and developing countries. These new paradigms are the changing goals and objectives of education, world declaration of EFA and MDG commitments, civil society initiatives, and scarce resources; each of which will challenge

EMIS development in different ways and these calls for building a strong information base that requires more disciplined and systematic operational procedures and practices ( Graca, 2006 & Cassidy: 2005).

Nationally, the government of the federal Democratic Republic of Ethiopia (FDRE) issued, in the second half of the 1990s, a comprehensive ESDP against the backdrop of Ethiopia's long internal conflict and the deterioration of the education sector. The strategies focus on the development of education over a 20-year period. The program articulates the medium and long-term strategies for and priorities for the period. One of the priority areas were the development of EMIS. It is expressed that accurate and timely information essential for education managers and planners to effectively operate and develop the education system (Attfield, Mathewos, Parolin & Grauw, 2002).

The aforementioned international and national targets have implication for EMIS. An efficient EMIS is indispensable in evaluating the progress and impact of these policies. Above all, one must recall that an EMIS is a tool to make the goal of education for a nation's population a reality. This means the information produced by EMIS should make it possible to judge the efficiency and effectiveness of education. In the long term, the true test of an effective EMIS is whether it has directed towards the accomplishment of those goals.

Thus, the emerging demands for reliable, up-to-date and timely data and information by local and international users have alerted data producers and providers to improve their management efforts to meet these demands. Deficiencies or inadequacies in its availability, utility or quality have far-reaching implications (Carrizo, et al., 2003).

Unfortunately, it seems that EMIS has not been given the attention that it deserves, as a result of which the system of collecting even the minimum needed data from the different types of educational institutions and processing the same for dissemination and use, has become quite ineffective. If information is poorly gathered and sorted, inadequately edited, incorrectly analyzed and badly presented the information system will fail in its primary function. Studies conducted in this area have revealed that information system seems unable to keep up with the requirements of practice

and the practitioners. Kawalck (2008) has described this problem as” A gulf between the discipline and that of practice” (p.xiii). The implication is the need for bridging.

Studies conducted in various developing countries in 1980s identified that lack of timely, accurate information on the number and distribution of students, teachers, schools and instructional materials as a major impediment to more effective allocation of recurrent resources (Chapman & Mahlck, 1993). In support of this Adeyemi (1995) has pointed out that information has remained the missing elements in Africa’s socio economic development planning equation.

Association for development of education in Africa (ADEA) (1996) and UNESCO (2006) also have reported that there has been lack of timely and relevant data needed to establish basic indicators of education activities. In support of this idea, Mahlck and Ross (1990) has revealed that despite the need for an efficient and effective EMIS, many countries have made very little corresponding changes in the design and management of the information system. These show that in various developing countries including Africa, educational decision-making is constrained by availability of information problems and related to information quality.

EMIS problems have its roots in a number of theories as raised above. The problems in general are data/information that many education leaders and decision makers need is not available or not available when needed, or not available in formats that are useful, or when data is available, it is of questionable reliability. The regular Joint Review Missions (JRM) conducted to monitor the implementation of ESDP-II in Ethiopia at the MOE level have also identified the challenges facing the education system of the country. Out of the most prominent and persistent challenges the absence of reliable data/information to capture the quantitative and qualitative results of education provision and delivery system was found to be critical. Based on this problem JRM recommended for ESDP-III to provide district, zone, and regional levels with staff knowledgeable and experienced in handling and analyzing statistical information (MOE, 2004; MOE, 2006).

In Oromia there is no comprehensive study made so far on regional EMIS management. However, the only prior research by Tiye (2006) has tried to investigate the EMIS practices and problems in the decentralized system of education in the region. He came up with conclusions like

capacity problem of EMIS staff, poor performance of EMIS functions, absence of manuals, lack of analyzed data, and absence of educational survey in the region. Jeilu Oumer (2001), in his study titled "*Decentralization of Education Management: A Case Study in Oromia*", has also identified lack of good communication, inadequate information system and choices as a serious problem in educational management. As the researcher perceived, the existing problems in the EMIS of the region require more detailed systematic and scientific examination to minimize the gap between EMIS and education management-the availability, utilization and demand gap.

It is at this point that the need for this study comes to its relevance. There is a clear need to see whether there is a fully functional and efficient information system management in the region. Information management by definition is the application of management to the acquisition, organizing, control, dissemination and use of information. Hence, without management system it will be difficult for the region to bring about any reform in basic education and achieve its priorities (MDG and EFA) within the specified time range through continuous monitoring and evaluation and informed decision making. Meaning that, Lack of effective and efficient EMIS threatens the achievement of regional, national and international priorities.

With this strong belief, the researcher initiated to study the practices and problems of EMIS management based on the following basic questions.

1. To what extent do EMIS functions apply at all levels of education?
2. What are the major education data/information available to users?
3. To what extent are educational information used for management, planning, and monitoring and evaluation of the system..
4. What is the status of EMIS quality in the region in terms of content, form, and timeliness?
5. What are the major problems that impede the management of EIS in the region?

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

#### **1.3.1. General Objective**

The general objective of this study is to assess the practices and problems of EMIS management in Oromia, and then to propose solutions for the problems identified.

#### **1.3.2. Specific Objectives**

- To scrutinize the extent of relevance, reliability, timeliness and comprehensiveness of educational information of the region.
- To spot the major EMIS functions performed at schools, WEO, ZED, and region.
- To review the EMIS outputs existing in schools, WEO, ZED, and region.
- To identify the format in which education information is made available to user
- To review the education information utilization of clients for decision-making activities.
- To spot major factors hindering the utilization of education data/information
- To pin point major factors affecting EMIS management.
- To propose solutions that could solve the identified problems.

### **1.4. Significance of the Study**

In the information age of today, there is no dispute in the indispensability of EMIS to decision makers, planners, researchers and a wide range of other beneficiaries in all sectors and walks of life. During the education management process, the information system informs the different actors and partners on the state of the sector. With this ground, efforts to improve the quality of data and information available to describe education system and support decision-making should be underway in the sector.

In line with this, the study may be of value and interest to the education system of Oromia in that:

- a) Decision makers and planners are confronted with lack of accurate, relevant timely and complete information. Hence, this study may provide better understanding and awareness on the part of decision makers and planners about EMIS problems and the major causes. This may create a stage for discussion. In turn, policy and practice of EMIS may be improved.
- b) It may enable the EMIS personnel function properly by indicating ways for the proper functioning of EMIS from school up to the region.
- c) It may open the way for subsequent activities touching on more varied aspects of EMIS.

### **1.5. Delimitation of the Study**

Initially, this study was confined itself to Oromia, because, in the region there has been serious problems of education information system management that require investigation as indicated in the statement of the problem. Besides, the presence of the largest student population, teachers and schools in the region assumes the existence of gigantic EMIS with its consequent problems. Moreover, it is probable that research findings arrived at from such large scale study could be inferred to other regions owing to its potential to represent other regions' EMIS activities in the country.

It was again delimited to 8 zones, 17, and 64 public primary and secondary schools of the region. The size was delimited just to keep the study manageable to the available human and material resources. Regarding the delimitation of levels of schools to primary and secondary; primary schools are a worldwide concern in connection with EFA and MDGs goals; hence, accurate, reliable and timely information base is mandatory to monitor success regionally, nationally and internationally against the goals. Secondary schools data/information management system, on the other hand, is a base for planning TVET institutions and universities which are again the timely and prior concern of the education system of the country. The two levels, as to the practical experience of the researcher and the existing reality, however, have no record keeping system and structure. These appear to make the delimitation areas valid. Still, it was delimited to the EMIS management aspects like the collection and analysis, the demand and utilization, and the dissemination of data/information; because an assessment of practices and problems in such areas could make the forth-coming conclusions on EMIS management of the region credible,

because they are the major functions in EMIS management. The study was again confined to educational statistics collected annually through annual data collection questionnaire, as it is the major statistical base of the region that involves schools, woredas, zones and region. Respondents were only school principals, WEO statisticians ZED statisticians, OEB EMIS staff, as there are no other individuals who have a direct stake with education data/information management than the indicated ones. Of course, others like PTAs; WEO, and ZED heads were included for the same reason indicated above.

### **1.6. Limitations of the Study**

The first limitation of this study is that teachers, students, other government and non-government sectors who are the expected users of the EMI all should have been included in the sample, but due to the larger scope of the study it became difficult to include in the sample. Efforts were, however, made to include some teachers and students through FGD.

The second limitation of this study is data obtained from FGD could not be tape-recorded since the members did not permit to be recorded that could increase the probabilities of losing something of importance. To keep this limitation to the minimum the write ups were taken back to the members for correctness, verification and confirmation.

Besides, since there has been new assignment of workers due to the BPR, the respondents were mostly new assignees who have less knowledge in EMIS of the region. In order to minimize the impact of the short comings in this respect, previous EMIS staffs were used as accessible as they were in responding to the questionnaires.

Therefore, indeed the study would have been more exhaustive and complete than it is now had these limitations been inexistent. However the maximum effort was put to make the study come up with relevant information and recommendations that would assist in understanding the real nature of the problem as well as in revealing the current managerial practices of EMIS in the region.

## 1.7. Definition of Key Terms

*Information system* – Is all components that work together to process data and produce information (OZ, 2002).

*Information* – Is data that have meaning within a context (OZ, 2002)

*MIS* – Is a data processing exercise based on the identification of an organization information requirements (Adeyemi, 1995)

*Quality* – Desirable characteristics of data/information.

*Data* – Raw facts and figures about events (Curry, Flett & Hollings worth, 2006)

*Information management* – Determining where information is located and used who has access to it and how controls are applied to its use (Adman & Warren, 1996)

*Woreda (Ana)* -Is an area marked off and developed for administrative purpose with defined authority and responsibility representing a population of up to 100,000 people (TGE, 1992).

## 1.8. Organization of the Study

The study contains five chapters. The first chapter deals with the problem and its approach. The second one treats the related literature review. The third chapter consists of the research methodology and procedures of the study, while the fourth one deals with the presentation, analysis and interpretation of the data. The last chapter contains summary, conclusions and recommendations. Appendixes were attached in the end.

## CHAPTER TWO

### Review of Related Literature

The problem EIS management has been a point of discussion for several years by researchers and other authorities. These scholars have also attempted to treat the problem from different perspectives. To this effect, this part of the paper discusses the views of different researchers under the following main head topics: An overview of information system management, EMIS, EIS management, factors affecting EIS management, lessons learned in managing EIS, and development of EMIS in Ethiopia.

#### 2.1. An Overview of Information System Management

##### 2.1.1. Information and Information Management

From an educational perspective, it is necessary to be clear about the meanings associated with certain words, which are used a great deal in discussions. Hence, there is a need for some sort of definition as to what constitutes information before considering issues relating to information and information system.

The two words data and information are used in a confused way, sometimes overlapping in Pairs, and sometimes simply being substituted for each other without distinction. They are not synonymous, but inter related. Authorities in the area justified the same. For instance, Senn (1985) has defined data as a raw material, and information is processed goods. Like wise, Dunn and Morgan (1987); Curt, et al., (2006) have explained data as raw facts and figures about events. The definitions above reveal that each datum represents some aspect of the event. In addition, there is a need for processing along with other data in order to produce meaningful information. It takes, therefore, work to convert data into information, because data have no context to give them real meaning.

According to Augerous and Conford (1998), information is data that have been processed and organized for some purpose. They however note that the output of data transformation process constitutes information only if some person can extract meaning from it. The implication here is information is not equally useful to all individuals. Tegegn (2003) has also confirmed that information is additional knowledge the user's desire about the functions under their responsibilities. In the same manner, Wilson (1996) has stated that information is data that have been converted into a meaningful and useful context for specific end users. Information is processed data placed in a context that gives it value for specific end- users. Therefore, information is distinguished from data by the fact that it has been structured and so has a context of some sort, which determines its meaning or its relevance or its accuracy. In this thesis, however, data and information were used interchangeably.

**Information system:** Information system is one of the functional systems of any organization that deals with data /information. It is an integral part of an organization and exists to serve the information needs of that organization. In this regard, Adman and Warren (1996) have explained that information system is a set of interrelated components, which work together to produce information in a form usable for the purpose of; strategy formulation and operational planning, controlling operational activities and facilitating decision-making

In sum, data are raw facts where as information is processed data that has context. Data by themselves are meaningless; they must be changed to a usable form and placed in context to have value. Paradoxically, however, what is information for one person may not be for another. In the same sense, one person's information may be some one else's data. Data became information when they are transformed to communicate meaning or knowledge, ideas or conclusion. The system that deals with data input, data processing and output formation is information system.

**Data/Information Management:** Education is essentially an information processing enterprise in that huge masses of information are essential to its management, so that good teaching and learning takes place (Goodlad, Toole, & Tyler, 1966). Meaning that, information has an essential role to play in all aspects of academic life, research, teaching and learning for both students and staff. It is also important in decision-making, management and control. Thus, it should be managed as a key resource – like any other resource (Adman & Warren, 1996). Information management is the application of management to the acquisition, organizing, control, dissemination and use of information relevant to the effective operations of each department (Powell, 1999; Hattery, 1971; & Mannino, 2007).

Information management is involved in the management, control and maintenance of information resources as well as information content. The target of information management is to keep the information resources available, reliable, controllable, maintainable, as well as integrated and consistent (Wilson, 1996).

According to the above definitions, information management is a management practice that determines where information is located and used, who has access to it, and how controls and improvements are applied to it. The task of information managers, therefore, needs to be an understanding of what information is genuinely needed, where and by whom this information is

created and stored; and needs to be thinking about what links should be made to ensure good communication between demand and supply.

### **2.1.2. Information suppliers and Users**

According to UNESCO (1961), those who are concerned with the planning, administration and improvement of education in a given country or community are responsible for the collection compilation, analysis and presentation of educational information. These are first, the national, provincial, and local educational authorities with their administrative, supervisory and teaching personnel from the ministry of education down to the classroom teacher. Secondly, other government agencies responsible for planning or management involving educational matters for example national planning commissions, ministries of finance, other ministries concerned with education in special fields, such as agriculture, health labor, central statistics authorities, and other bodies which are instituted permanently or temporary with some responsibility for educational matters. Third are national or local non-governmental bodies. Finally, all agencies or organizations concerned with educational research and information; such as national councils of educational research and information, government and non-government bureau of educational research, teachers, professional associations, and public information offices of various kinds.

The task of collecting, processing, interpreting and communicating educational information to users is a difficult one. The task becomes dynamic and complicated. The personnel at the different levels of the education system and at other responsible bodies who are engaged in the process of information supply have to be trained in the collection of data and other such domains. This capacity building activity becomes one of the major responsibilities of information management system.

Inline with this, Ellison (2005) has argued that information supply problems are related to low staff capacity, larger number of data providers and the difficulty of communicating with many of them, poor record keeping, inappropriate data collection forms, low response rates, inadequate skills of using in hardware and software, and inability to meet national and sub- national information needs. According to Ellison there are problems on the supply part that distort data/information quality. This requires managers to work on improving the supply components of the information system.

The users of information should be the focus of information management. There are internal and external users of information. Internal users are planners, decision makers, decision support systems, different departments and division of the education system; school principals, teachers and parents. External users are other government and non-government institutions, national and international organizations, donor agencies and civil societies (Tegegn, 2003; Ross & Mahlck, 1990).

In the reviews of the main information users of education systems it is argued that each of these demand different kinds of data/information to be presented at different levels of aggregation. In order for information to be employed in educational planning the format and delivery of the information had to be adjusted to the specific needs of the different decision making levels. Thus, the design of EMIS must incorporate the decisions as to which must pass to another level.

Different factors impede the demand for information on the part of users. On the one hand, a major impediment to more effective use of data is the concern of potential users about the quality of data available to them ( Hallack, 1990; & Imboden, 1980). Windham(1993) has also indicated that resistance to more systematic use of education data in planning and in decision making is often grounded in users skepticism as to whether the data are any more reliable or trust worthy than the more informal sources of information they have been using Consequently, a first priority in improving data use is to assure potential users that the data are reasonably accurate.

On the other hand, what potential users believe about the quality and availability of data often has more impact on their willingness to use it than the actual characteristics of the data themselves. In support of this, Scott (1986) has argued that managers have personal characteristics that influence their attitudes toward information system, their information needs, and the ways in which they interact with systems. Thus, it is necessary not only to investigate the characteristics of data and procedures of its collection, but also to understand how potential uses regard the information, which is available to them.

Information to be used effectively, thoughtful attention needs to be given to the information architecture with in the education system. Information architecture refers to the paths and links in the communication net work through which information flows-Vertical and horizontal. Vertical

flows refer to communication between levels; horizontal flow refers to communications among units at the same level of the organization. Ministries in many developing countries are characterized by weak links vertically and very few connections horizontally. Sharing information between units often means transmitting it up the hierarchy to higher authorities who then transmit it down to the intended recipient unit (Chapman & Mahlck, 1993).

Better data leads to better plans and policies, which lead to better practices. Better data is a necessary input to effective decision-making but not a sufficient one. The positive impacts come only as the information is used and used wisely (Chapman & Mahlck, 1993). This requires that users have access to relevant and accurate data, the necessary training to interpret them and an understanding of the larger context in which their decisions will be implemented, and requires users pay attention to the impacts of their decisions-how information contributes to policy, and how policy influences practice.

In sum, it is important to note that all managers of educational information should focus on users' needs and expectations. The nature of the information and the ways in which it is provided should therefore be tailor made for each level in the education system.

## **2.2. EMIS**

A management information system informs management. An education management information system (EMIS) informs the management of education process. Managing education through informed decision-making requires the availability of accurate and timely information, which links together resource input to education teaching and learning. An Educational management information system is, therefore, the basis of management, planning, and evaluation of an education system (Carizo, et al., 2003)

EMIS is demand responsive, which means that it serves the needs of the consumers or the users of information. Thus, to serve one's clients, conducting surveys of the information needs of consumers and the capacity needs of producers; and produce according to user- friendly and interpretable information products and services.

To develop and maintain such a vast demand responsive and user-friendly system, various kinds of knowledge and skills are required in different areas, such as system development, quality assurance training, technical support, and national reports.

### **2.2.1. What Is EMIS?**

The acronym EMIS stands for “Education Management Information System”. By definition, an EMIS is an organized group of information and documentation services that collects, stores, processes, analyzes and disseminates information for educational planning and management. As to Cassidy, 2005; UNESCO, 2003; and Carrizo, et al., 2003, an EMIS is a system of the collection, integration, processing, maintenance and dissemination of data/information to support decision making, policy analysis and formulation, planning and management at all levels of an education system. Tegegn (2003) also has stated generally that EMIS is a system for processing information for management of education.

According to the definitions given above, EMIS is a system that provides educational administrators with information services that support them in decision-making, planning and control function. Thus, an EMIS is a support service that provides information services for different educational management activities.

The typical data items found in any EMIS are number of schools, teachers, pupils, disaggregated by gender, levels of administration (region, zone, district, etc) educational institutions (primary, secondary, etc) and ownership (private, government, etc). However, policy makers and planners expect more from an EMIS, which includes financial and socio-economic data (UNESCO, 2003).

### **2.2.2. Objectives and Functions of EMIS**

There is an inevitability about the increased importance assigned to data based planning and management (Chapman & Mahlck, 1993). Information determines the knowledge base from which critical decisions are made and provides current as well as projected scenarios of the system for which decisions are being made. It is with this ground that, Tegegn (2003) has observed information as an additional knowledge the users’ desire about the functions under their responsibilities. Information indicates knowledge about how are the goals and objectives set are achieved, how efficiently the resources provided are being utilized and how far the governing

rules and regulations are being followed. Authorities in the field, put the functions of information in different ways though the central essence appears the same.

For instance, Telem (1990) has put the function of information into four main types: (i) analysis of accumulated historical information, (ii) what has happened information, (iii) why did it happen information; and (iv) what would happen-if information. When one looks at the functions listed above, it becomes apparent that information serves the functions of showing the status and past trends of the sector's performance, and of forecasting in the process of planning. Curt, et al., (2006) broadly have categorized the functions of information into two: facilitating communication between different stakeholders and providing basis for informed decision-making at all levels of organizations. The main objective of an EMIS is to integrate information related to the management of educational activities, and to make it available in comprehensive yet succinct ways to variety of users. The most direct operational application of EMIS is to support on going management, planning, and monitoring and Evaluation activities of the education system.

The overall concept of an EMIS has given to provide information for users in the following functions: Management and Administration of the education system, planning of the education system (Macro and Micro), and monitoring and evaluation of the education system. (Carrizo, et al., 2003; Ross & Mahlck, 1990; UNCSCO, 1961; & Windham, 1996).

#### **2.2.2.1. Educational Planning and Information**

Educational planning is the application to education of what real educators seek to instill in students; a rational scientific approach to problems. Such an approach involves identifying objectives and available resources, analyzing the implications of alternative courses of action and choosing wisely among them, deciding on specific targets to be met within specific time limits, and finally developing the best means of systematically implementing the choice made (UNESCO, 1961).

Senn (1987) has noted that without planning, an organization can easily end up with a set of non-integrated and duplicate applications that are not as useful as they could be and that represent wasted resources. Thus, plan guide activities, integrate efforts, smoothen operations and provides basis for evaluating results.

Sound and effective educational planning, however, depends very much on the reliability, validity, and comprehensiveness of educational data available. The planner will not be able to work out a good strategy if a set of appropriate educational data is not at hand. Generally, this is because educational data/information shows the status and development of education. To the contrary, planning without reliable information leads to guess work, which resulted in groundless effort. As such the first prerequisite for planning is, to have quality information base that show the past, the current state of a given organization and then enable forecasting scientific.

Consequently, Educational planning is envisaged to encompass the provision of information necessary for planning and implementing appropriate policies in the short, medium and long term plans with regard to pupil enrollment and flows of pupils in the various levels and types of education and the adjustments of the out puts in accordance with the economic and social needs.

Apart from enrollment data and flow, it is also concerned with the main policy problems involved in creating a constant supply of teachers of varies types and disciplines in sufficient numbers. To ensure that adequate school buildings and equipment are available and that they are used in an economically and efficient way is a major concern of the education planner. Finally, the education planner is required to estimate the expenditure necessary to carry out the proposed program, to investigate possible sources of finance and to promote the efficient utilization of financial resources (Shukla, 1983).

In order to diagnose the educational problems and to provide sufficient and reliable information that will lead to orderly and efficient expansion and changes in the education systems in keeping with the nation's needs for policy and wise decision making, it is obvious that the first step is to survey the educational situation and needs. This requires a well-organized statistical service to provide essential and reliable data relevant to planning (Shukla, 1983).

The data so required are of two types. In the first place, there are statistics of the educational system it self, that is pupils, teachers buildings, expenditure etc. Secondly, there is a large amount of supplementary data required for the calculation of forecasting and planning coefficients with in the educational system. These include demographic, economic and social data (Haji salhe, 1977).

#### 2.2.2.2. Monitoring and Evaluation of the Education System

There has been a growing recognition that monitoring and evaluation of an education system provides information related to where the system has been and where it is now. It is also, after monitoring and evaluation that making adjustments in policies and programs that are always necessary in ever fast-changing world. A good information system is a prerequisite that provide an accurate reading of the progress of implementation and of the results, being achieved (Baum & Tolbert, 1985).

An effective monitoring and evaluation system will not only keep the implementing agency informed about the progress in the system but also give advance warning about areas where potential bottlenecks are likely to occur. Thus, the monitoring and evaluation function requires careful selection criteria indicators as well as suitable documentation and scrutiny (Shukla, 1983).

Monitoring, according to Aspinwall, et al (1996), is the process of gathering information about all activities or programs on continuing and systematic basis over a period, normally in relation to the implementation of a plan. Effective monitoring process provides the right information to the right people at the right time in the right formation for decision-making. It is with this idea in mind that Kawalck (2008) has said “One of the most fundamental uses of information systems in organization concerns the application of information to monitor aspects of organizational activities (p. xii).”

The objective of monitoring is to detect less than optimal functions of the system and in this fashion make improvements up on the new system (Banghart, 1969). To achieve this objective, the types and source of information needed, how it is collected and disseminated, when it is collected, and to whom should the information passed questions needs answers. The process of monitoring forms the basis for evaluation.

Evaluation is part of the decision making process in education. At the most straightforward level, evaluation means placing a value on things. Evaluation is a data gathering process to determine the worth of instruction, and its strengths and weaknesses. Evaluation involves making judgment about the worth of an activity through systematically, openly collecting, analyzing information about it, and relating this to explicit objectives, criteria, and value. Hence, the methodology of

evaluation includes collection, organization, analysis and reporting of information about system performance so that judgment could be made.

Authorities in the area, for instance, Hopkins (1989) clearly has put that the purpose of evaluation is to provide information for decision-making. Similarly, Stufflebeam (1966) has stated the purposes of evaluation as adding any substantive knowledge to educational process; providing information to adjust, discard or otherwise change the application of an on-going educational processes; providing justification for a political social, and economic action relating to education; and providing instruments which may be used to carry information on the success of the process to the educational community.

When comes what to evaluate, there are different ways of expressions. But when seen by the elements: inputs, process and products are the major elements of evaluation (Banghart, 1969; & Stufflebeam, 1966). The general criteria of evaluation are that the total system should operate at optimal fashions.

### **2.2.3. EIS Management**

In order to respond to changing information demands, managers must have the appropriate systems and procedures to ensure that valid data is collected and analyzed in a timely manner to support decision-making (Tegegn, 2003).

Successful managers are those who are best able to manage and use information to make decisions that are timely and effective. It is not without rational that authorities justify that as much as 80 percent of the typical executive day is dedicated to information receiving, communicating, and using it in a wide variety of tasks (Davis & Olsen, 1985; & Senn, 1987). Certainly, information is a basis for virtually all activities performed in an organization. Therefore, the need for the development of management system to develop and manage it is the implication. The management of any system activity begins with planning and the information system is no exception. Hence, the management of information begins with information system planning and goes up to feedback. Let us treat the information system life cycle before dealing with its management activities.

Information system's life cycle components are those activities required to collect data from suppliers, process it, and take the results back to the users. Graca (2006) has put the chain of information system life cycle into three major stages: the collection, the analysis and the communication of information. Windham (1996) also has argued that the operation of MIS involves five major steps: needs identification, data collection, data processing and analysis, information provision, and information utilization. Another author, Tegegn (2003), still has put the steps further to six stages: Data collection, Data analysis, publication, Dissemination, utilization and Feedback. Though, the counts of the steps differ, the activities the authorities included under their respective steps remain the same. The difference only lies on treating individual activities separately or merging similar activities together.

### **2.2.3.1. Information System Planning**

An information system is complex and therefore needs an overall plan to guide its initial development and subsequent change. Davis and Olsen (1985) have illustrated this point by saying that the complexity of information resources management suggests planning is vital to success. In support of this idea, Tegegn (2003) has argued that with out proper planning we cannot engage ourselves in plan implementation, or meet deadlines or achieve the high performance level in all EMIS activities. Similarly, Kanter (1992) has noted that sound EMIS planning is an essential ingredient in successful information system. The values and the need for planning are well understood. Planning invites for better implementation which likely results in better result.

As in any system planning process, EMIS planning begins with the identification of vision and mission statements. The next step is to analyze feed back information that is obtained from environmental analysis-Some call it SWOT analysis (Tegegn, 2003). Kanter (1992) briefly has put the necessary contents of information system plan into categories that answer six basic questions: where are we? (ii) Where do we want to go? (iii) How do we get there?, (iv) when will it be done?, (v) who will do it?, and how much will it cost?. But, the components explained by Davis and Olsen (1985) seem comprehensive. They put as information system goals, objectives and architecture, inventory of current capabilities, forecast of developments affecting the plan and Specific plan.

Planning requires the involvement of those directly or indirectly affected by the plan. To justify this, Kanter (1992) has said that planning is every body's job. Similarly, Tegegn (2003) has raised the point that EMIS planning requires higher involvement of users and producers of information. Accordingly, planning EMIS is the job of those involved in the supply and demand of information.

A very important fundamental concept of information system planning is that organizations plan should be the basis for information system plan. Within the context of overall organizational goals, policy, objectives, strategies, and plans, there should be policy goals, objectives, strategies and plans for the information system (Kanter, 1992; Senn, 1987; and Davis & Olsen, 1985). The sayings of Senn (1987) best fit this idea, "Trying to develop information system applications without a system plan is like trying to build a house without a blue print; at best both would end up as a helter-skelter struggle(p.198)."

#### **2.2.3.2. The Management of Data Collection and Analysis**

According to Windham (1994), one of the first tasks for an EMIS manager is to identify what information is required by analyst or planners to help them understand how education resources are transformed into educational outputs, particularly in relation to whether resources are being used efficiently or effectively in the education process. This is the need identification step.

Indeed, managers must think about the needs of the end user and whether data will help analyst answer specific questions or understand specific process. Stakeholders and end users of information should be involved in this process, not only as passive recipients for EMIS outputs, but also as owners of the process, to ensure the relevance of data/information. In support of this, Windham, Levin, and Bathory have noted that the critical task in designing effective educational information systems is the definition of information needs (as cited in Ross and Mahlck, 1990, p.72). After stakeholders need have been identified, it is necessary to see what other information exists in neighboring planning units or departments. Banerje (1984) has suggested briefly that, it will be immediately apparent that only if data collection is relevant, accurate, and available on time; processing of information, however- fast, will have meaning. However, Tom (1989) has emphasized that identifying users needs precisely and definitely is difficult because information

for decision-making varies with the level of management, the nature of the decision and type of problem being solved. These tell us that however challenging the need identification is, the activity requires attention on the part of the management.

Most often data is collected by means of questionnaires from schools by school heads, teachers or record officers. These questionnaires are prepared in centralized system at the EMIS centre or through decentralized regional offices. Information format is a common method of collecting data for an information system. The data collected through this medium must satisfy the need of the decision maker to increase the relevance of the data. In support of this, Ross and Mahlack (1990) have explained that an important part of translating interests to information is that the format of the information must suit the requirements of the decision makers. Hussein (1977) also has recommended that well designed forms with instruction that are easy to understand are needed to serve the purpose. He further advises that at all the design stages, the forms should be tested with a sample group of people in order to minimize error.

According to Ross, Postlethwaite, Lockheed, Grisay, and Bries(1990) the data collection instruments should be clear in terms of the information they seek, retain data disaggregated at an appropriate level. They keep on saying that basic requirements are that the questions posed do not present problems of interpretation to the respondents, and that when forced choice options are provided, the choices are mutually exclusive.

In most cases errors in data collection are observed as a result of poor instruction or/and forms being filled out by a person who is not properly motivated or who may not bother to pay proper attention to correctly fill forms. Besides, poor physical lay out, lack of question pre-testing and failure to use technology are deficits in data collection instruments. In general, properly designed forms are helpful in making sequence of items logical and decreasing the amount of time and effort required (Jenkins, 1997).

Normally, district education officers will ensure that the questionnaires or templates are completed correctly by the schools and passed on to the provincial offices in a timely manner. The provincial officers tended to be responsible for collating this information and forwarding it to the EMIS in the ministry, who in turn are responsible for analysis and subsequent dissemination.

After needs identification and the assignment of roles and responsibilities for data collection, it is important to determine the operational plan for data collection. Essentially this plan identifies the time in which EMIS activities take place and who is responsible of this process. Obviously, this will vary from country to country and depend on the structure of a country's education system and the type of policies they are implementing. Nevertheless, it will be important to determine the exact time period and format in which data needs to be produced, all of which provides the basis for working back and identifying when specific activities need to take place.

Data are collected so that they can be processed and analyzed for subsequent use by educational planners and managers. Once the data has been collected sense has to be made of it if it is to be turned into usable information (Aspinwall ,et al. ,1996)

The data processing phase is concerned with the transformation of raw data obtained during data collection into a form that is suitable for later analysis (Ross, et al., 1990). As for processing, UNESCO (2006) has confirmed that several types of processing are under taken. One is statistical analysis using disaggregated data, the other is an examination of the quality of the questionnaires and the third one is the processing, which is used for simulation and projection. In a similar manner, Tegegn (2003) has clearly listed activities performed while data processing as: monitoring instruments, the case as missing data, data entry program design, data entry, data cleaning and data compilation. Here, the whole process of data processing deals with organization of data for further analysis.

The data analysis stage is mainly concerned with the preparation of summaries of the data that have been collected and prepared for analysis. According to (Tegegn, 2003) the type of analysis we make is often tuned to the needs of different categories of users, especially policy makers. He further generalizes his idea by saying data analysis should be done with users in mind: general users, decision makers, planners, researchers, information service providers, students, and teachers. Windham(1996) has raised his worry that there has been less universal recognition of the need to provide data in a manner appropriate to the users that is appropriate to their capacities and responsibilities.

### **2.2.3.3. Utilization and Dissemination of EMIS outputs.**

Information is only of value when there is a use for it. In other words the value of information depends on the demand for it. The higher the demand, the more the value it has (Tegegn, 2003). This indicates that data/ information supply should base data/information demand.

Another important management question facing those managing EMIS is, therefore, the degree to which data is disseminated and utilized in the policy process. Dissemination refers to the action of distributing information using a variety of media, ranging from the traditional annual abstract of statistics to the use of the world-wide-web (Tom, 1989). Where as utilization refers to how data is used in the policy process, in many ways both dissemination and utilization are closely linked.

One of the best means of supporting dissemination is to develop a dissemination strategy, which should identify the information requirements of the large audience, the medium in which the document needs to be produced (paper or electronic) and the time in which circulation occurs. The development of a comprehensive dissemination strategy is only part of the solution. Parents and external stakeholders should also be provided with EMIS data in a format that they can understand and be given training to act on this information. Only through supporting such activities is it possible to encourage an external demand for EMIS outputs.

Within the education system, it is equally important to ensure the demand for EMIS outputs are translated into utilization. There is little point in having a demand for information unless it is used in the policy process. According to Windham (1996), an EMIS is more than mere data collection, but should facilitate decision making formulation of policies and budgeting in education. One of the most important mechanisms for translating demand into utilization is to support institutional development and ensure that neighboring units within the ministry have the capacity to utilize EMIS outputs. The provision of training and technology will allow decision makers to develop an effective capacity for data use. Moreover, UNESCO (2005) has suggested that EMIS must build on the underlying interest and goals of each stakeholder group to facilitate utilization For instance; planning units should understand how to use EMIS and in order to monitor the progress of policies towards defined objectives. Demand can also be translated into utilization lower down the education hierarchy through providing decentralized offices with the

capacity to develop operational plans and by linking these plans to the disbursement of funds. Utilization of information will also depend on whether end users have confidence in the data and do not resort to using other information sources to make decisions.

#### **2.2.3.4. The Important and Changing Role of ICT Infrastructure**

Telem( 1990) has noted that IT efforts represent the technical elements of a larger information management capacity. ICT includes three main components: MIS, hardware and human factors. IT implementation is invigorated by office automation tools such as word processing, electronic archives, automatic dialing, automatic follow up decision, electronic appointment books, desktop publishing, spread sheets, etc.

In order to ensure that data collection, analysis and dissemination processes occur in an efficient and effective manner, it is important to choose the appropriate ICT for the context in which EMIS operates. When choices are made about ICT it is vital that decisions are driven by information requirements and not hardware or software issue (Curt, et al., 2006). Education departments must ensure that choices about ICT infrastructure are determined by their own information requirements and are compatible with systems being used by other units or government departments. Another decision concerning ICT is the degree to which they are sustainable over the longer term. All ICT infrastructures supporting EMIS should also be housed in an environment, which will prevent the negative impact of heat, dust and humidity (Cassidy, 2005; & Banghart, 1969).

#### **2.2.3.5. Institutional Building and Capacity Development**

Besides, ensuring that timely and valid data are collected and appropriate choices are made about ICT infrastructure, it is equally important to ensure that sufficient attention is given to institutional building and capacity development. Institutional building focuses on whether institutions have the appropriate systems, procedures and structures to carry out their functions and mandates, while, capacity development is concerned with the professional and continual development of those working in the field of EMIS and related activities.

Improving long-term institutional capacity involves cultural changes, especially with regard to how information is used and how different institutions depend on each other's activities. For instance, EMIS are normally responsible for producing data in order to meet the planning

requirements of other units, such as those involved in planning, budgeting or monitoring type activities. The management decisions within such units rely heavily on data produced by EMIS in order to carry out their functions and mandate. Correspondingly, if there is no capacity within such units the demand for EMIS outputs will fail, all of which could impact negatively on data quality. Institutional development is about building this interdependency between such units and supporting a culture of information use and sharing (Igbaia &Shayo, 2004).

In addition to institutional building it is also important to ensure people have the appropriate skills to operate and maintain EMIS at all levels of the education system. To this end, Igbaria and Shayo (2004) have recommend that human capital management in the IS department requires an understanding of IS staff and what they experience as they accomplish their assigned duties.

#### **2.2.3.6. Feedback**

An education management information system should provide feed back about its own efficiency and effectiveness. Feedback indicates how well the management information is accomplishing its intended purpose. Largely, feedback about effectiveness must come from the participants in the management information system. This entails assessments of how well the management information system has identified trends, monitored the environment, and accomplished its other tasks. The feedback should be systematized and made a routine aspect of the management information systems control and management activities (Scott, 1986).

Once produced and distributed, the products will be used and applied. Then feedback can be collected. It is a learning process. Through feedback, achievements and problems could be identified. It also allows the realization that others know and appreciate what has been done, that there may be better ways of doing things and that there may be more innovative ideas that could support to produce timely and accurate information for an over all educational development (Tegegn,2003). Hence there is a need that mechanisms for collection of feedback be included in the yearly information plan of the system's life cycle.

The EMIS must also be able to adapt in response to feedback about its performance. That is it must be designed to be easily modified if, for example, different information is needed because the environment changes or if the organization undertakes new target. The information system

should be capable of being easily expanded to accommodate growth or new programs and easily contracted in response to elimination of programs (Scott, 1986).

## **2.2.4. Monitoring and Evaluation of EIS**

### **2.2.4. 1. Monitoring EIS**

Monitoring is an important component part of EMIS activities. It is part and parcel of EMIS when establishing what has been planned and implemented and what remains to be done. Monitoring allows reviewing original objectives. So that one can check that he/she is on the right track. It also enables establishing whether we can produce to deadline the out put as outlined in planning and programming document and within the given budget. Thus, monitoring demands a regular and systematic gathering and analysis of information on the implementation of EMIS activities (Tegegn, 2003).

From the above explanation it is important to note that monitoring is the collection of information in a systematic way, carried out to know what has been done, and in what way; what problems have been encountered during implementation, and how we have tackled them; what lessons can be learned for future implementation with the goal of improving the functions of EMIS.

Therefore, monitoring generally checks that the instruments of data collection are designed/reviewed with changes incorporated from last feed back information, that pre-testing of instruments is done, that instrument is published and allocated to zones, districts and schools, and that a follow up mechanisms is in place to monitor the returns. Moreover, it checks whether the information out put is disseminated through those channels and feedback is obtained from users.

### **2.2.4. 2. Evaluation of EIS**

It can be said that evaluation means placing a value on things. It is basic for every activity we undertake. EMIS activities are no exception. Inline with this, Kawalck (2008) has noted that if the information system practice is not evaluated, it is not possible to know whether it has been worth the effort. It also can result in an inability to abstract learning into future policies, procedures, processes and methods. The matter is evaluation is an essential aspect of EMIS management that helps to make judgments about the worth of an EMIS activity.

In the words of Aspinwall, et al. (1996) and Tegegn (2003), evaluation involves making judgments about the worth of an activity through systematically and openly collecting and analyzing information about it and relating this to explicit objective criteria and value. As Such, evaluation involves looking back to what we have done and realizing the strengths or weaknesses, learning what to modify and extracting good practices for further implementation to ensure better performance. It looks at all activities starting from data collection to utilization and feedback. It also tests implementation procedures to see if the desired outputs were achieved and investigates problems encountered and the method used to tackle it.

Davis and Olsen (1985) have also acknowledged that evaluation of information system includes assessments of system value as well as technical, operational, and economic evaluations. According to these authors there are four methods of assessing system value that includes: Observation of the system's relevance to specific task improvements, determination of users' willingness to pay for system capabilities or out puts, logs of voluntary system usage, and measures of user information satisfaction. Operational consideration relates to whether the input data is properly provided and the out put is usable and used. Economic evaluation provides a current assessment of cost benefit. Technical evaluations focus on the system performance criteria established in feasibility study.

#### **2.2.5. Dimensions and Quality of data/Information**

Sources of information used in organizations range from formal to informal, internal to external in varying degrees depending upon individual needs and preferences. However, all types of information sought by managers can be viewed along three dimensions: content, presentation, and timing (O'Brien, 2003). Curt, et al. (2006), however, has extended it into four by adding scope. Since, scope is included under content; it is not worth treating it separately. The other three were discussed below.

**Content:** The type of information conveyed and what it tells us. Managers need to be aware of the type of information presented to them so that they can assess its value in the correct context. Content includes accuracy, relevance, completeness, conciseness, scope, and performance.

**Form:** The form information takes can have significant impact on the way it can be handled by the recipient. The presentations of information need to consider clarity, detail, order, media, qualitative or quantitative, formal or informal and structured or unstructured.

**Timing:** Having established the content and presentation of the information there is a need to consider when it is available. Information is produced and is required at different time intervals, some on regular basis, and some as the necessity arises. Managers should understand what time period is covered by a piece of information.

It is important that managers understand the nature of the information they receive. By understanding its nature, it is possible to balance its importance and relevance to a specific situation. Without such an understanding a manager might give undue weight to inaccurate or irrelevant information.

Having looked at the types of information available in organizations there is a need to consider what characteristic might be desirable in that information, and the data on which it is based. To be useful, information must have essential attributes both as individual items and as set of information. People want information of high quality that is information products whose characteristic attributes or qualities make the information more valuable to them.

Quality is defined as excellence or fitness of the system in serving the purpose for which it was developed (Davis & Olsen, 1985; Ivanov, 1972; & Powell, 1999). Data are of high quality if they are fit for their intended uses in operational decision making and planning. In other words, data/information is deemed of high quality if they correctly represent the real world construct to which they refer. Thus, data quality depends on its actual use.

Data/information quality attributes are multidimensional. A considerable amount of data quality research involves investigating and describing various categories of desirable attributes of data/information. Davis (1994) as well has mentioned data quality characteristics as accessibility, timeliness, accuracy and precision; relevance and validity; and completeness. Wilson (1996) and Oz (2002) also have identified relevance, completeness, accuracy, clarity, and timeliness. As it is

apparent from the various authors' description of data/information quality, all the attributes are more or less the same. Accuracy, completeness, relevance and timeliness seems inclusive and common to all.

**Accuracy:** A helpful measure of accuracy is error rate and it is essential to keep errors to a minimum. Inaccuracy takes two forms: Bias and error. Bias may well be a function of the way original data was generated gathered, processed or presented. Random error is inaccuracy that arises from inherent variability. But the more accurate the information the more it contributes to decision making (Curt, et al., 2006).

**Timeliness:** Information must be available when needed. Other wise it may be considerably less useful or useless. This means that time must be allowed to gather and process the necessary information and data (O'Brien, 2003).

**Appropriateness:** Above all information should be appropriate for its intended use. There are four main issues to consider: the completeness of information, the level of detail required, the level of summarization required and the relevance of the information to its recipient (O'Brien, 2003)

Poor data quality can have a severe impact on the overall effectiveness of an organization. Davis and Olsen (1985) have warned that since information is a critical resource, low quality information has adverse effect on organizational performance. The quality of a product depends on the process by which the product is designed and produced. Likewise, the quality of data depends on the design and production process involved in generating data. The authors attribute the cause of poor data quality to activities involved in the process of data/information production. This indicates the need to take care while data/information system activities are implemented. In addition, quality assurance or control of information is critical.

According to Chapman and Mahlck(1993) there are four primary threats to data quality: (I) errors and omissions in reporting data; (ii) errors in transferring and summarizing data; iii) errors in the treatment of missing data; and (IV) lack of consensus about data definitions.

Indeed, data quality could be affected by the formats of the questionnaire, personnel involved in completing questionnaire, processing and analysis of data and data flow. These all factors could be categorized as error and bias factors. The source of error could be random or capacity problem. Bias is the one that comes as a result of external factors like incentives or sanctions resulting from figure increment or decrement; and a result of the existing culture. For instance, there is a prevailing practice of reserving some number of students in each class while the beginning of enrollment report so that it could replace drop outs that could happen in the future. On the contrary, there is a case when student number is intentionally increased if budget release is based on student number.

### **2.2.6. EMIS Integration**

Integration of data/information systems is one of the key concepts associated with a management information system. Procedurally, it is the “tailpiece” to data collection and the “prelude” to data utilization (Hua & Herstein, 2003). Besides, Scott (1986) has defined integration as the interlocking of system so that data from one system can be routinely passed to, or retrieved by, one or more other systems.

Integration, an underlying principle of an EMIS, can be understood in terms of eight main aspects or dimensions: needs of producers and users, data, information handling, storage of data, retrieval of data, data analysis, computer and manual procedures, and networking among EMIS centers (UNESCO, 2005).

The key to data integration is the process of standardizing data structures, types, formats and coding schemes as well as creating institutional agreements to share and mine data for decision making purpose.

An EMIS aims to coordinate information resources such as the education statistics unit in the education information and documentation services and units and departments holding various administrative records for education. The aim is to integrate the various sources of educational management information into one coordinated system to serve the entire country.

While integration makes information processing more efficient by reducing both intermediate processing and the incidence of independent generation of the same data by multiple bodies, an even important benefit is that it provides more timely and relevant information (Scott, 1986). Fering (1987) also has emphasized the use of integration in his words, “to produce information that is consistent, accurate and economical it is necessary to have systems and subsystems in order to achieve not only effectiveness but also efficiency (p.231).”

### **2.2.7. Data/Information Flow in the EMIS**

The flow of information is crucial in an EMIS network. In many existing linkages, information is transmitted mainly in one direction, owing to out-dated management practices. In this regard Chapman and Mahlck (1993) have said that a management information system is too often conceptualized as a vertical flow from school to district, region, and eventually central ministry levels. Often overlooked is the importance of horizontal and diagonal information sharing. For example, data on enrollment are transmitted from the schools to the district education office and then to the provincial education department and then to regional and national EMIS centers with out a flow in the reverse direction.

With in a well established EMIS, however, it is imperative that both basic data feedback information flows both ways between EMIS centers and other levels. Like wise information products should be provided to as much other information out lets as possible in order to reach the maximum number of users.

In order for communication to take place within an organization the information within an organization has to flow from one place to another horizontally across organizational activities, vertically up and down the hierarchy and diagonally which combines the two (Curt, et al., 2006). In the similar vain, Burch and Grundnliski (1989) have explained that a free flow of information in all directions facilitates better working relationships, increase understanding, precludes barriers, build and smoothen operation.

At the same time, appropriate data flow mechanisms and channels are needed to promote the exchange of complementary information. Improvements in disseminating data to potential users are also needed. And the mandate of individual information agencies should be clearly defined.

### **2.3. Factors Affecting the Management of EIS**

Information is a valuable and strategic resource that requires adequate management in order to support decision making. However, everything about information management is challenging. Some authorities reveal that there are several issues that proven particularly troublesome for efforts to manage EIS. For instance, Kamar (2006) has identified factors hindering effective management of information as:

**1. Lack of National Information Policy:** National information policy is of decisions taken by the government through appropriate laws and regulations to orient harmonious development of information transfer activities in order to satisfy the information needs of the country. NIP looks into the mechanism put in place in terms of personnel, funds, and information communication infrastructure. Besides, legislations, regulations and guide lines that influence information acquisition access, dissemination, utilization, and availability.

**2. Unqualified man power:** Considerable knowledge and skills are required to build, maintain and use an EMIS. The role of information professionals is to collect process and combine information from all sources and present it in the most effective manner. Despite the increased number of information professionals graduating from training institutions and the increased number of information training institutions, there is inadequate human resource capability in information departments that govern and disseminate information. lack of available human capacity significantly limits EMIS development. Building human resource capacity has long been known to a critical factor in the success of EMIS development however.

**3. Information illiteracy:** – Information illiteracy is the inability to recognize an information need, to find appropriate information from a variety of sources, to evaluate it and to apply it constructively. It is also the inability to shift, evaluate, understand, and interpret available information and; use it productively in order to generate a product or service and communicate effectively. In this regard, Moses (2006) has uncovered the seriousness of information illiteracy when he says “those who generate the data, the teachers and staff of schools, themselves may have little idea whether their information has been of use, has been retained, or in fact has reached those who need to know”.

**4. Poor ICT infrastructure** ICT infrastructure includes software, hardware, technology and people. Thus, the availability and quality of these infrastructures affect management of information.

The recent rapid emergence of ICT, most notably of the internet around the world has given rise once again to great expectations for the improvement of education data and information through technology. In some cases ICT based EMIS is now almost the norm in planning for EMIS. Still in some other cases EMIS initiatives do not include plans to use the ICT infrastructure for some forms of data collection, dissemination, and utilization.

**5. Poor data quality** (either incomplete, poorly defined, too late, redundant, or not comparable year to year). Often the reliability of data that is collected is questionable. Since each subsequent level receives the data in aggregated form from the next lower level, there is no way of detecting errors in the data. Similarly, at the state level also, since only the tables already prepared by aggregating the data from schools are received from the localities, the errors in school forms remain undetected. The entire responsibility for checking the school returns is that of the localities, which are generally not well equipped to check and ensure reliability of the data and its consistency with the data of the previous year. Often errors occur in manual totaling and tabulation which remain uncorrected

**6. Poor remuneration for EMIS workers.**

Workers engaging in the collection EMIS activities ranging from collection through analysis and dissemination should have given incentives so that they could be motivated to perform their responsibilities effectively and efficiently. In conditions where there are no reinforcements it becomes probable that the responsible bodies don't commit themselves to such complex and tiresome EMIS activities.

Cassidy (2005), however, broadly has put the challenges into Organizational issues, Human development issues and technical issues. Organizational issues involves, problems related to data/information responsibility, management, development, maintenance, cost; and data/information sources, collection, analysis, dissemination, presentation, and demand problems. Human resource developments issues involve problems related to various facts of staff capacity including skills, lack of time to collect, analyze, synthesize and interpret data/information as

limits to management. Technical issues involve what infrastructure is already in place for any aspect of data/information supply or provision.

Inline with this, Ellison (2005) has identified EMIS challenges as low staff capacity, larger number of data providers and the difficulty of communicating with many of them, poor record keeping, inappropriate data collection forms, low response rates, inadequate skills of using in hardware and software, and inability to meet national and sub-national information needs. According to Ellison there are problems on the supply part that distort data/information quality. This requires managers to work on improving the supply components of the information system.

## **2.4. Lessons Learned in Managing Education Information**

### **System**

Efforts to improve the quality of the data/information available to describe the education system and support decision making have been underway in both developing and developed countries. The efforts to develop more comprehensive, and integrated EMIS to support the monitoring and evaluation of education system performance and the crafting of effective education policies began in some countries as early as in the late 1980s and continued through out the 1990s and into the new millennium (Cassidy, 2005 ).

Based on the efforts made, there are countries whose initiative to build, strengthen and manage EMIS could be exemplary for other countries. What requires attention is, however, that the context in which EMIS operate will shape the type of problems experienced and actions taken? However, more important is how countries respond to such problems. Thus, the writer tried to present the EMIS of Latin America and the Caribbean (Cassidy, 2005); Namibia (Viogts, 2005); Ghana, Mozambique, Nigeria and Bangladesh (Trucano, 2006) whose experiences and initiatives could be a lesson for EMIS management in Ethiopia.

Literature has revealed that data collection and analysis in Ghana, Mozambique, Nigeria have experienced challenges. Many of the problems appear to originate from the design of data collection instruments and the processes associated with its implementation. Nevertheless, many of the problems could have been ameliorated through the development of certain procedures or systems.

In Ghana, Mozambique, Nigeria and Bangladesh, for instance, the problem related to questionnaire was solved by using common definitions and terminology when designing questions for census and the involvement of district offices and schools in the development of questionnaires and the data collection process.

In Namibia, reform was made for the collection and processing of educational information. The reform involved how to manage data collection, analysis and dissemination so that demand responsive and user-friendly data/information could be produced. The management of EMIS broadly followed an information cycle. According to the experience this country, after knowing the information needs of the users and the means of presentation to be used, including the level of aggregation the data set is defined. Then, the best sources of data are determined, considering accessibility of the source, reliability of the data, and its cost. Finally, the data base is designed before the design of the questionnaire. This order allowed designing a good data base not constrained by existing questionnaires, while the questionnaire design benefited from being based on an efficient data structure.

Bangladesh has a long history of successful data collection. Under the data collection process, head teachers and the chain of school management committees are responsible for ensuring that returns are accurate. Subsequent levels of education system are also expected to check a sample of census forms in order to ensure consistency and validity. Some forms of incentives are introduced for those involved with the process to encourage data collection. This also happened in Ghana through the use of capitation grant. In some other countries, the school forms are no longer annual. Argentina and Botswana for instance, student enrollment is assessed three times a year (Chapman & Mahlck, 1993).

The evidences from the above countries revealed that the process of data collection and analysis are plagued by a number of difficulties, including those associated with the construction of questionnaires, and the lack of commitment from those involved in the process. However, there are lessons to be taken from these countries. A bottom up approach to data collection involving schools and decentralized offices may have more merits than atop down approach. Similarly, there are benefits of adopting an incremental approach to data collection in which resources and

efforts are focused on a small geographical area instead of beginning the process by implementing nation wide survey.

With regards to EMIS out puts utilization, there are good experiences to rise. Evidence from Ghana demonstrates that EMIS data is helping district offices to formulate their annual operation budget, according to the funding criteria: 30% is awarded for pupil enrollment levels, 10% is based on the number of schools, and 60% according to variables like number of untrained teachers, pass marks for science and mathematics, type of class room structures and availability of water or seating capacity. Each of which is heavily dependent on EMIS data.

In Namibia, educable efforts were made to increase utilization. To site some, the existence of data set meeting information need, consistent collection of education statistics in two annual surveys, the existence of well maintained data base, the production of two annual reports, development of GIS and the dissemination of sufficient printed reports in different forms, and the capacity to respond to ad-hoc requests for statistical information. These all strategies contributed to the increased utilization of EMIS out puts in Namibia.

Utilization of EMIS data varies from one country to another, but one of the important messages from the two countries is the need to ensure close links between data collection and utilization, particularly at decentralized levels. Unless managers at the decentralized level can see the utility of data they are collecting, they are not likely to be committed to this process.

Evidences about dissemination of EMIS out puts occurred at varying degrees in countries. In most countries, MOE is responsible for producing and distributing EMIS outputs to stakeholders. But the media and the formats by which it is distributed varies. In Mozambique concrete steps been taken in producing timely information in an analytical manner and made this available on the web. Ghana as well attempted to produce census data in electronic format and distribute to stakeholders. Namibia also attempted to produce two annual statistical reports (the 15<sup>th</sup> school day statistics and an annual statistical report) and disseminate in different forms like, booklet, presentation of posters and a slide show of graphics on computer, holding policy dialogue.

Without a wide spread dissemination strategy it is not possible to start creating an external demand for EMIS outputs. It is important that ministries identify the target groups for dissemination and determine in what format data should be produced and the time period in which it should be distributed.

Experiences in the use of ICT infrastructure also varies with countries. In Mozambique, the minimalist approach was used. It is the use of simple data bases, spread sheet and transfer of data via email. The advantage of this strategy is that it is sustainable and facilitates timely transfer of data. Bangladesh, initially, relied on spreadsheets and relational databases for data entry and storage. However, with the spread of internet service provision, the different layers of education system are turning to web- based solutions for data entry and storage. The benefit of such approach is that data can become easily accessible at all levels and cost effective. In Namibia as well, there is a capacity to respond to ad-hoc requests for statistical information relying on relational data base.

Nigeria in this regard is successful and her experience provides a great lesson for other countries. Instead of introducing a wide scale national reform of the whole ICT system, a small scale pilot was implemented. This helped identify problems and ensure they were ironed out prior to going national. Before implementing the pilot, a needs analysis was undertaken to identify the most appropriate architecture for the EMIS, resulting in the decision to develop a web-enabled system to collection, collation and reporting of school level data.

The evidences suggest that appropriate choices had been made to match ICT infrastructure with a particular environment. As mentioned earlier the minimalist approach could provide a cost effective and efficient means of data collection, especially in countries that lack skills to maintain complex systems. The recent rapid emergence of ICT, most not ably of the internet around the world has given rise, once again, to great expectations for the improvement of education data and information through technology. ICT based EMIS is now almost the norm in planning for EMIS. Most EMIS initiatives some countries include plans to use the internet for some forms of data collection and dissemination.

To see the experiences of countries with regards to institutional building and capacity development in EMIS some exemplary efforts could be raised. Ghana, for instance, provides an example of best practice. Ghana made a comprehensive program of reform, whose specific purpose was to develop decision making processes at all levels of the education system. This was achieved by a new institutional structure and a comprehensive package of capacity building activities across horizontal and vertical levels of the education system. As for the capacity building, the first stage involved a needs analysis to identify skill requirements followed by development of a plan for human resource development. Then, a series of workshops has been implemented across the country to train people in basic data analysis and in how to develop operational plan. Attempts were made to train more people in IT skills than are employed at district offices. The rationale behind such an approach is that they can create a pool of skilled workers who can be drawn up on should the district officials leave in search of other employments.

Lesson from this section is that institutional building and capacity development are closely associated with all stages of data collection, analysis, and utilization. It also reveals that demand for EMIS can only be encouraged through paying more attention to institutional building and capacity development at all levels of the education system.

Considerable knowledge and skills are required to build maintain and use an EMIS. A lack of available human capacity significantly limits EMIS development. Building human resource capacity has long been known to a critical factor in the success of EMIS development.

In the brief review of the history of EMIS development in Latin America and the Caribbean, it is possible to learn that many efforts made had been resulted in failure. In the mid 1990s, international and regional development agencies and NGOs began to pay more attention to the development of local knowledge and skills to use data to support decision making. By 1992 a call for the development of common set of indicators for monitoring the development of education system had been made. By 1998, Regional Education Indicators project (PRIE) established with basic objectives of constructing and strengthening national systems of statistics and foster their use in the design of education policies. Similar initiatives-Monitoring Education Reform project with objectives of performance monitoring tools and developing school principals' capacity to

manage and use information in decision making; and the establishment of Caribbean Regional Education Management Information System with an effort to link education data systems through out the Caribbean and ensure timely availability were made in 2000.

Even though such unreserved efforts had been made limited success was registered. The lessons learned from the failure of these countries are: Every thing about EMIS management is challenging. Such as, EMIS design and development is complex and labor intensive; sustained high level support, political will, broad based involvement in the system, building of capacities for data use are all essential to successful EMIS. Organizational and human resource constraints are at least as significant for EMIS development as technical issues. Integrating data and data systems are largely challenging .Insuring the timely availability of data and information is not easy. Only supply of better data is not enough to ensure use. But demand is critical. Overall, EMIS improvement efforts in isolation will lead to failure. Therefore, comprehensive system wide views of improvement initiatives are critical.

## **2.5. Development of EMIS in Ethiopia**

In Ethiopia, the education system including all its Administrative hierarchies had EMIS for quite a number of years under different structures and regimes. Although there had not been some concrete evidences, there is an estimate that the history of EMIS in Ethiopia may be dated back to 1957, the year when a research and statistics department was established in the MOE. Until 1968, education planning in the MOE had been entrusted to an ad-hoc body appointed when it became necessary to formulate educational plans and programs. Then, the education program, planning and research department was instituted in 1968. The department began to serve as a permanent body responsible for the planning and programming activities of the MOE (Kasaw, 2001).

Until 1991, data and information was centrally processed and disseminated. But with the coming into power of the new federal oriented government and the concomitant development of the currently working education policy in 1994, the country shifted from highly centralized to a greater degree of decentralized education system. The guideline developed by the MOE in 2002 has given more authority and responsibility to regional education Bureau, districts and schools (Tiyе, 2006).

In the federal level, EMIS is operating as one of the functions of the education sector development program (ESDP) planning and policy analysis department. Likewise EMIS is organized as a function under the planning and programming service in the regional education bureaus.

To support the decentralization of education, the government has stated on the *Negarit Gazeta* No.26 proclamation No.41) 1993 that regional education bureau (REB) has the responsibility to collect and disseminate the regional statistics (TGE, 1992). This might have influenced the REB to include educational information unit under planning and engineering service that also extends up to the district level. It was since then that the unit became functional in the region. The unit has started collecting data through annual statistical format since 1995 and the first annual statistical data was published in 1996). The data collected through statistical format are aggregated by the education management information unit to produce the annual education statistical abstract. The abstract is prepared to pave the way for educational planners and policy makers so that they will be able to attain sufficient educational information. The abstract includes data on performance of the region's educational sector relating to kindergartens, primary, secondary, technical and vocational schools and teachers training institutes (information from personal communication, February 21, 2010 with previous OEB EMIS head).

The information unit collects data through three mechanisms. One of the mechanisms is collecting data using standard educational format. The statistical format was first developed by MOE. But since 1994 the form at has been adapted according to the need of the region, not excluding the central governments interest (information from personal communication, February 21, 2010 with previous OEB EMIS head).

Quarterly or periodic reports are the second kinds of mechanisms that help collect information from every segment of the region. Further more, the third mechanisms of collecting data is by preparing different formats that can be used to collect information monthly semi annually and yearly.

After the activities of the education sector of the region was started to organize based on process of activities by BPR principle starting from 2007, the EMIS unit became a part of educational planning, Budgeting, and Evaluation and information management work process.

## CHAPTER THREE

This part of the study presents research design and methodology. It contains research design and methodology, data sources, sample and sampling techniques, data gathering tools, procedures of data collection and method of data analysis.

### 3. Research Design and Methodology

#### 3.1. Method

A descriptive survey method of research was applied in this study. The researcher's choice of this method was not without ground. Firstly, the overall thrust of the study, the objectives to be attained, and the wording of the objectives, calls for descriptive design. A writer in Research methodology Kamar (2005) also has suggested the choice of research design to base on the objectives of the study. Secondly, all the research questions that ask about a current state or conditions require a strategy of description. Descriptive survey explains the present through the description of what now exists. In this regard, Creswell (2009) has suggested that certain social problems call for specific approaches. Therefore, to have a clear picture on the existing problems and to attain the objectives stated earlier a descriptive survey became appropriate.

#### 3.2. Data Sources

**Primary Sources:** These were OEB EMIS staff, teachers' development and Educational managers process owner, and information and Public relation process owner, ZED statisticians, WEO statisticians, School principals, PTA and school board representatives, DEFDO, and JICA.

**Secondary Sources:** Annual statistical abstract, annual data collection questionnaires and other periodic statistical reports were used as secondary sources.

#### 3.3. Samples and Sampling Techniques

The study area is Oromia regional state, which comprises 18 zones and 6 city administrations. Within these zones, there are 291 woredas consisting of 9325 primary and 386 secondary government schools. Thus, the study population is OEB EMIS staff, 18 ZED statisticians, six city administration Education office statisticians, 291 WEO statisticians and 9711 school principals. From this study population the study involved six zones and two city administrations, 17 woredas, and 72 schools as study samples. The sample populations were selected according to the following procedures and methods.

In order to reduce the expense of traveling widely the sampling was made by stage. First a sample was taken of areas, and then a sample of people with in these areas was taken. Accordingly, the study zones were identified from the rest zones of the region by stratified random sampling. First, the zones were categorized into strata based on their geographical location from Oromia education Bureau. Hence, distance and direction from the OEB was the base of stratification. This was used to see whether there could be distance influence on EMIS activities of the zones. As a result, there became four strata of zones; namely, east oromia, west Oromia, central Oromia, and south east Oromia. Then by using fishbowl draw method of drawing a random sample West Hararghe from East Oromia, Arsi and Guji from south east Oromia, North Shewa from central Oromia and East wollega and illubabor from West Oromia were included in the study. Nekemte and Assela were the subject of the study from city administrations. No categorization takes place for city administration, they were just chosen randomly.

From each sampled zone, woredas were selected by proportionate stratified random sampling technique. First, woredas from each zone were stratified into two strata based on the number of their schools, because as the number of schools increases, the complexity of the EMIS activities increases. This calls for representing samples from those having small number of schools and those having large number. For this purpose stratification is an appropriate method to increase representation of the woredas. Creswel (2009) has also argued that stratification ensures representation. Accordingly, the first category included woredas with relatively larger number of schools, and the second category included woredas with relatively small number of schools. Then, by using simple random sampling one/two woredas from each stratum of woredas were sampled.

Schools were again selected from each woreda by using proportionate stratified random sampling. This method was used because randomly selected sample particularly a small sample may by chance have an under proportion of one type of unit in it.

The strata of schools were first formed considering their student population. Distance was considered because infrastructure availability has relation with distance, which again has influence on EMIS management. Accordingly, the whole schools were categorized into very distant having larger number of student population, and distant having small number of student

population; and nearer having large number of student population and nearer having small number of student population. Nearness and farther ness was predetermined by the researcher together with woreda officials based on their “zonal” classification. Then, One/two school/s was/were sampled from each category randomly based on the number of schools included in each strata.

From each sampled areas that is zones and woredas- statisticians; from the sampled schools, school principals were purposely included in the sample. Regional EMIS team caseworkers and process owners were also purposely included in the study. They were purposely selected because they could provide detail and in depth information about EMIS than any others. For interview, 2 OEB process owners, 3 ZED heads, and 3 WEO heads and three deputy principals were selected. The bureau process owners were selected based on availability sampling. The zones were randomly selected from the sampled zones, and one woreda from each sampled zone for interview was taken based on the number of schools they have (a woreda with large number of schools from Arsi, a woreda having average number of schools from North Shewa , and a woreda with small number of school from East Wollega). The schools were again selected from each selected woreda in a similar manner as woredas were selected; the only difference was schools were selected based on the number of their students. PTA members of the interviewed woredas were participated in the FGD. The total number of the sample population was presented in the table below.

**Table 1:** The Sample Population of the Study

No	Sample areas			Individual respondents									Tot.
	ZED	WE O	Sch	For questionnaires				For interview				FGD Sch	
				OE B	ZE D	WE O	Sch.	OEB	ZE D	WE O	Sch		
1	Asella	1	6	-	2	2	6	-	-	-	-	-	8
2	Arsi	3	12	-	2	6	12	-	1	1	1	6	29
3	Guji	2	8	-	2	4	8	-	-	-	-	-	14
4	E/Wollega	2	8	-	2	4	8	-	1	1	1	8	25
5	Jima	3	12	-	2	6	12	-	-	-	-	-	20
6	Nekemte	1	6	-	2	2	6	-	-	-	-	-	10
7	N/Shewa	2	8	-	2	4	8	-	1	1	1	6	23
8	W/Hararg	3	12	-	2	6	12	-	-	-	-	-	20
	<b>Total</b>	<b>17</b>	<b>72</b>	<b>20</b>	<b>16</b>	<b>34</b>	<b>72</b>	<b>2</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>20</b>	<b>173</b>

NB: Nekemte and Asella are city Administrations

-Total refers only to individual respondents including those from OEB.

### 3.4. Data Gathering Tools

Questionnaires, interviews, focus group discussion and document analysis were instruments of data collection.

**Questionnaires:** Questionnaires were used to gather information on characteristics of respondents, EMIS management, organizational development and capacity building, and factors affecting EMIS management. Questionnaire was selected because it provides the researcher a way to get personal information from geographically dispersed subjects that could not be obtainable by using other methods. Besides, it offers greater anonymity to the respondents which could have a positive impact on the findings of the study. Three types of survey questionnaires were prepared: For school principals, for ZED and WEO respondents, and for OEB respondents. However, the questionnaires were not very exclusive. Both types of the questionnaires comprised close-ended and open-ended questions. Close-ended were prepared to keep the respondents' minds riveted on the subject and to facilitate the process of tabulation and analysis. Open-ended questions were prepared because it permit the responding person create an answer.

**Interview:** This instrument was employed to collect further information on availability, use, quality of EMIS outputs and factors affecting EMIS management and utilization. A face to face interview was held with Two OEB process owners; Arsi, East wollega, and North Shewa ZED heads; and 3 WEO heads -one from each interviewed zone and three school deputy principal again each from the interviewed woreda. Semi-structured interview was used because of its average flexibility and the few restrictions it places on respondents answer. In this regard, Kamar (2005) argued that Semi structured interview permits an average flexibility so that the interviewer could make minor modifications where needed.

**Focus Group Discussions** – This instrument was used to gather detail information on the extent of quality and utilization of data/information. In addition, it was used to make discussions on problems and remedies of information system of their respective schools. This instrument was used because it has a real benefit of sharing views, experiences and stories between participants, and of acquiring the insight full and rich data from participants (Miller and Brewer, 2003). It was employed with representatives of PTA and school boards of one sampled school for interview;

who were designated by woreda education office based on their participation in school management.

**Document Analysis-** Annual statistical abstract and statistical questionnaire of the 2006/7 and 2007/8 were analyzed in order to investigate its contents and its presentation. Moreover, the review of related literature was made to see the existing theories on the topic under study. In line with this Kamar (2005) has noted that analysis of the content of records, documents and other printed matter constitutes the second use of survey to collect facts for a research study. Due to this, document analysis became one of the instruments of data collection.

### **3.5. Procedures of Data Collection**

The questionnaires were pre-tested in Horo guduru wollega zone, Horo, Amuru, shambu city administration, and Jima Rare WEOs; and Horo Chabir, Abuna, Shambo, Agamsa, Bada Warke and Wando schools. It was pre-tested to refine if there is any confusing and unclear questions of the questionnaires. Authorities in the field like Aspinwall, et al. (1996) have suggested that which ever evaluation method you use and however your sample, you will find it helpful to pilot or trial the method with a few people first otherwise, you may find yourself asking the wrong questions or that different people understand quite differently.

The validity of the tools was maintained by linking each question items in the tools to the objectives of the study. Three EMIS experts from OEB were also consulted to validate the questionnaires. Accordingly some Corrections and modifications were made particularly to school principals questionnaires with regards to EMIS functions and EMIS demand. The reliability of the questionnaires was finally checked by test/re-test method of external consistency procedures and by split half technique of internal consistency procedures. In the first case the result for the four groups became 0.12 (test score - re-test score) and below. In the second ones Spearman Brown formula was applied to the product moment correlation between scores. Thus the result was 0.86. In both cases the result indicated higher reliability of the questionnaires.

The first step towards collecting the necessary data, with the tools made ready, was making official contacts with the sampled zones to get permission and support for the research work. Then, woreda education officials, school directors were informed about the objectives of the

study and conditions were facilitated for the data collection activities. Next the researcher arranged time and place with the respondents. Accordingly, schedule was set for the distribution and collection of questionnaire papers and the conduction of interview and FGD.

Then the questionnaire papers were distributed first to the respondents by the researcher at their respective offices. A stay of seven days permitted to get it back. Meanwhile, the researcher carried out interviews with those selected for interview where there was interview. After completing the interview, the FGD followed. It was conducted between the researcher, PTA, and school board representatives who were selected in advance. Completing the interviews and discussions, the researcher shifted to collecting questionnaire papers.

Finally, a trip was taken to make an interview with Teachers' development and educational managers, and Information and public relation work process owners of OEB.

### **3.6. Methods of Data Analysis**

Data were collected by means of questionnaires, interviews, and FGD and document analysis. The questionnaires were containing 109,101, and 103 items for school principals; WEOs and ZEDs; and OEB respondents respectively. The majority of these were likert like items measuring attitude based on a scale from "strongly agree (5)" to "Strongly disagree(1)", "Always (5)" to "Never(1)", "Very high(5)" to "Very low(1)", "Very serious(5)" to "Not a problem(1)." Out of the total 142 distributed questionnaires 128(90.14 %) were properly filled and returned.

After these questionnaires were collected, the data obtained both from the characteristics of respondents and the main questionnaires on scales of instruments were first tallied and then tabulated in tables. Depending on the tabulated responses percentages, arithmetic means, and standard deviations were calculated based on the nature of the items. Then analysis and interpretations followed. Data obtained from open ended questions, interview, focus group discussions, and document analysis were carefully examined and studied. They were used to crosscheck and to validate the information obtained from the questionnaires. Hence, both qualitative and quantitative methods of data analysis were employed

The response categories on attitude scales having five levels (5 to 1) were collapsed to three levels –below average (1-2.49), average (2.5-3.5), and above average (.3.5 and 5).This was to make the interpretation easier based on a few response categories, to increase the confidence level of the analyst as the distinction between such few response categories becomes very clear, and to avoid unnecessary complexity.

The strength of the conclusions about group differences or the relationship among variables was supported by different statistical tools. These tools are a test of independence and used to estimate the likelihood that some factor other than chances accounts for the observed relationship. The choice of these tools was dictated by the nature of the collected data and objective of the study. Accordingly, chi-square, ANOVA, t-test and rank order correlation coefficient were applied to test the existence of significant difference of the valuations in the responses of informants at 0.05 significance levels or 95 confidence level. When the data were presented in counts and frequencies and appear to be nominal and ordinal in nature Chi-square and rank order was used; whereas, for those measured at interval and ratio level ANOVA and t-test were applied. To report the test results the standardized reporting technique suggested by Gravitter (2000) was used.

## CHAPTER FOUR

### 4. DATA PRESENTATION, ANALYSIS, AND INTERPRETATION

This section of the study presents the analysis and interpretation made of the data collected. The data was collected through questionnaires, interviews, FGD, and document analysis. Questionnaires were used to obtain data from school principals, WEO statisticians, ZED statisticians, and OEB Educational Plan and Budget Preparation, Monitoring and Evaluation and Information Management work process staff. About 142 questionnaires were distributed to the respondents, out of which 128 (90.14) were properly filled and returned. In this group, 16(80 percent) were REB respondents, 16(100 percent) were ZED statisticians, 32(95.3 percent) were DED statisticians, and 64 (88.9 percent) were school principals. Interview was conducted with two OEB process owners, one OFEDB, one USAID agent in OEB, three ZED heads, and three DED heads. FGD was also conducted with three schools (one group from each interviewed woreda) key PTA representatives.

The respondents were considered pertinent and dependable source of information due to their positions and responsibilities vested on them in the EMIS. EMIS involves primarily in one way or another all the above-mentioned groups in the production and utilization education data/information. Moreover, 90.14 percent return rate of the questionnaires, the use of other additional data collection tools like interviews, FGD, and document analysis; and the use of diversified and relevant significance test tools like ANOVA, t-test, chi-square, and rank order correlation coefficient could be assumed to make the conclusion reliable.

As shown in table 2, sex, there was by far, greater discrepancy in gender balance between male and female respondents in all groups in which females were about 9 times less in number than that of males. This broad gap probably showed the under representation of females in decision making positions of EMIS. The gap has no impact on the result of the current research. The reason for the broader gap between the two, however, needs other further investigation.

#### 4.1. Characteristics of the Respondents

Before, discussing the data related to the major questions, a summary of characteristics of the respondents was presented below.

**Table 2: Sex and Age Profile of Respondents**

Item		Respondents									
		school		WEO		ZED		OEB		Total	
		No	%	No	%	No	%	No	%	No	%
Sex	Male	60	93.75	26	81.25	15	93.75	14	87.5	115	89.84
	Female	4	6.25	6	18.75	1	6.25	2	12.5	13	10.16
	Total	64	100	32	100	16	100	16	100	128	100
Age	25 and less	6	9.38	-	-	-	-	-	-	-	-
	26-35	30	46.88	12	37.5	4	25	3	18.75	49	38.28
	36-45	18	28.12	16	50	9	56.25	10	62.5	53	41.41
	Above 45	10	15.62	4	12.5	3	18.75	3	18.75	20	15.63
	Total	64	100	32	100	16	100	16	100	128	100

Age wise, 38.28 percent of respondents were in the age range of 26 to 35 years. About 5341.40 percent of them were in the 36 to 45 years age range. Combined together those respondents who were in the age range of 26 to 45 years were nearly 80 percent of the total respondents. About 4 percent and 16 percent of the respondents were included in age ranges 25 and below, and above 45 years old, respectively.

From the above description, it was possible to say that the majority of those who were involved in EMIS activities were at the active working age group.

As is seen in table 3, educational level, only 28.12 percent of school principals and 18.75 percent of WEO statisticians were diploma holders. Fifty-nine point thirty- seven percent of school principals, 81.25 percent WEO statisticians, all ZED and 75 percent ZEB respondents were BA holders. Overall, 75 percent of the respondents were BA/BSC holders.

**Table 3: Educational level, Areas of Study and Experience of Respondents**

Item			Respondents									
			School		WEO		ZED		OEB		Total	
			f	%	f	%	f	%	f	%	f	%
Education level	TTI		8	12.5	-	-	-	-	-	-	8	12.5
	Diploma		18	28.12	6	18.75	-	-	-	-	24	22.5
	BA/BSC		38	59.37	26	81.25	16	100	12	75	92	75
	MA/MSC		-	-	-	-	-	-	4	25	4	25
	Others		-	-	-	-	-	-	-	-	-	-
	Total		64	100	32	100	16	100	16	100	128	100
Field of study area	Statistics		-	-	-	-	-	-	-	-	-	-
	Computer service		-	-	-	-	-	-	-	-	-	-
	Inf. technology		-	-	-	-	-	-	-	-	-	-
	EdPM		18	28.12	-	-	2	12.5	4	25	24	18.75
	Mathematics		4	6.25	6	18.75	3	18.75	2	12.5	15	12.5
	Physics		4	6.25	2	6.25	2	12.5	1	6.5	9	7.03
	Others		38	59.37	24	75	9	56.25	9	56.25	80	62.5
	Total		64	100	32	100	16	100	16	100	128	100
Work experience	In current post	< 2 years	46	17.87	18	56.25	6	37.5	11	68.75	81	63.28
		2-5 years	8	12.5	6	18.75	3	18.75	2	12.5	19	14.84
		>6years	10	15.62	8	25	7	43.75	3	18.75	28	21.87
		Total	64	100	32	100	16	100	16	100	128	100
	Total service	Less than 5	-	-	-	-	-	-	-	-	-	-
		5-14	34	53.12	10	31.25	3	18.75	1	6.25	26	32.5
		15-25	20	31.25	18	56.25	10	62.5	11	68.75	40	50
		Above 25	10	15.62	4	12.5	3	18.75	4	25	14	17.5
		Total	64	100	32	100	16	100	16	100	128	100

About the required educational level, recently REB has set out the requirement for school principals and statisticians at all administrative level. Accordingly, the minimum requirement for WEO statistician is diploma, degree for ZED, and masters' degree for OEB. For first cycle primary school-diploma, second cycle primary-degree, general secondary and preparatory-masters degree and PHD respectively. In the document, the required field of study area for the post at zone, woreda and school was indicated as 'any', which need to be specified to the field relevant to

the task (OEB, 2001). However, it was not implemented yet particularly at school and woreda. Therefore, when the data was compared against the requirement, the qualification of school principals and EMIS statisticians seems satisfactory. However, the lesser years of service illustrated in the table, may be due to the recent assignment with the standardized qualification. The interpretation is that the assignees have not served long in the current position that could have negative impact on EMIS activities.

Concerning the respondents' field of study, the researcher had tried to list down some alternative fields of study related to EMIS activities. The respondents have shown their fields of study. Accordingly, only 40.06 percent school principals, 25 percent WEO statisticians, 43.75 percent ZED statisticians, and 43.75 percent OEB EMIS staff; totally, 38.75 percent of EMIS workers and school principals were qualified with fields like EdPM, Mathematics, and Physics that were assumed to be relevant to the requirement of EMIS task. More than 60 percent of the respondents were qualified with other fields that were probably not relevant to EMIS tasks.

There is a need to assign people to where their skill and knowledge is required. Therefore, matching educational level and qualification with the task requirement should be the priority consideration in selection and recruitment of employees. What was observed from the findings of the study deviated from the principle. Thus, the assignment of personnel in EMIS position does not appear to consider field of study.

Job related and total years of service has its own positive contribution to any task performance. The data from respondents, however, reveal that 65.25 percent have less than two years of service in their current post. Only 15 percent and 23.75 percent of all respondents had 2-5 years of service and more than 6 years of service in their current position respectively.

Nevertheless, the respondents could have accumulated a good total years of service in other responsibility positions. Eight –two point five percent of them have total years of service ranging from 5 to 24 that could likely be a good working experience.

From the above description of current years of service and total years of service, both school principals and EMIS statisticians were experienced civil servants though they lack sufficient experience in their current position. The recently introduced work process (BPR) has been

underway in the region in all sectors of the state. The new assignment being implemented in this regard has had a lion share to the lesser experience of respondents in the new post.

As most respondents were new appointees for the position, it was probable that they could not provide sufficient data for the study. In order to counter balance this, the researcher has tried to contact previous EMIS workers. The implementation of EMIS activities are known to succeed if it is implemented well by experienced individuals in the post. The implication is that there is a high need of up dating the personnel for the post through different capacity building mechanisms.

**Table 4: EMIS Related Training**

Respondents by level	Training				(For those who took the training only) The given training is:			
	Taken		Not taken		Satisfactory		Unsatisfactory	
	No	%	No	%	No	%	No	%
School principals	14	21.87	50	78.13	2	14.28	12	85.72
WEO statisticians	16	50	16	50	6	37.5	10	62.5
ZEO statisticians	11	68.75	5	31.25	4	36.36	7	63.64
OEB EMIS staff	13	81.25	3	18.75	5	38.46	8	61.54
<b>Total</b>	<b>54</b>		<b>74</b>		<b>17</b>	<b>33.33</b>	<b>37</b>	<b>66.67</b>

As is observed from table 4, combined together, almost half of the respondents have taken EMIS related training, and the other half of them have not taken training related to domains of EMIS activities. Specifically, the problem of lack of training has been worsening down the administrative hierarchies. The majority of school principals (71.9 percent) and half of WEO statisticians had not taken training. Sixty-eight point seventy-five percent and 81.25 percent of ZED and REB EMIS workers respectively had taken training. Probably, the reason that the vast majority of woreda, and school level EMIS workers did not take training is that they are the newly appointees for the post. BPR related assignment, was even not wholly implemented at lower administrative levels.

This finding is consistent with the report of Ross and Mahlck (1990) that have pointed out educational bureaucracies in both developed and developing world are characterized by large numbers of middle level managers who have had neither formal nor on-the-job training concomitant with their responsibilities.

Some other writers have suggested that building human resource capacity significantly limits EMIS management (Cassidy, 2005). Tegegn (2003) and Carrizo, et al., (2003) have stated that training of EMIS personnel is a fundamental element in the quality of EMIS. This assumes incapacitating all EMIS workers specially those new appointees in the form of seminar, workshop, and short term.

Concerning the question that requests weather the training given was satisfactory or not, nearly most respondents (66.67 percent) perceived that it was not sufficient for the task. Still, the degree of satisfaction with the training decreases down the educational hierarchy. This is what has been the training trend in the region. A two months' training held for national or regional level authorities will become a short days or hours orientation for lower level practitioners.

An open ended question forwarded to identify areas of training revealed that the training was bound to orientations on how to fill the questionnaires and how to submit in time for school principals, and to how to compile and verify data for woredas and zones. Nevertheless, for regional EMIS staff the training included data verification, analysis, encoding, processing, interpretation and dissemination.

Of course, training can remedy in part the lack of skill and knowledge due to qualification if it given comprehensively. The findings of the study, however, showed that both ill trained and poorly qualified personnel run EMIS activities. EMIS personnel are highly in need of revision- and re-revision concerning qualification and on-the-job training if quality education data/information is required.

In summary, the personnel characteristics analysis indicated that the respondents have had sufficient education level for the position they hold. Nevertheless, they were not furnished with relevant experience, qualification, and training to shoulder the bulk of activities and responsibilities. This is a clear indication of the need for fulfilling basic skills and knowledge through training and assigning fit personnel to enable them discharge their roles and responsibilities.

## **4.2. Analysis of the Data on EIS Management**

The idea behind EMIS is to manage data which is somewhere on the system. The process of EMIS management will bring the data into a usable and understandable report. Thus, the final target of EMIS management is to avail data and information to users on a timely, reliable and predictable base via uncomplicated user-friendly interfaces.

This being the theory of EMIS management, the questionable is its practice. The subsequent sections of this analysis part could have responses particularly about collection, utilization, and capacity building practices in the study area.

### **4.2.1. EMIS Functions at Different Educational Hierarchies**

In the decentralized system of administration, every administrative level is assumed to gather process and utilize data/information. The existing practice, however, does not appear to be in-line with such principle. Thus, to look into what assumed functions were practical, and what were not in the respective levels of administration, this section became in place. The analysis was made for schools and region in isolation and WEO and ZED together. Because the largest share of EMIS activities lie in schools and region.

#### **4.2.1.1. EMIS Functions at Schools**

The largest part of basic information which is to be fed into EMIS is gathered at the level of schools and other educational establishments. Thus, in the process of collection, analysis and utilization various EMIS functions are expected. To elicit the opinion of respondents about major functions performed at school level, assumed functions were presented to respondents in a likert type scale to be rated as; very high (5), high (4), medium (3), low (2) and very low (1).

As can be noted from table 5, the most performed functions, as perceived by school principals, were collecting data, filling data collection questionnaires, and reporting to woredas, which had mean scores that range from 3.87-4.28. The respondents felt that storing data/information was partly done at their organization.

**Table 5: Respondents View on EMIS Functions at Schools**

Functions	Rating scale of Respondents										$\bar{X}$	SD
	VH		H		Ave.		L		VL			
	f	%	f	%	f	%	f	%	f	%		
Collecting data	32	50	16	25	8	12.5	4	6.3	4	6.3	4.02	1.207
Filling annual data collection questionnaire	32	50	12	18.8	12	18.8	4	6.3	4	6.3	4.00	1.234
Reporting to woredas	28	43.8	12	18.8	12	18.8	12	18.8	-	-	3.87	1.175
Storing data/ information	12	18.8	12	18.8	16	25	16	25	8	12.5	3.06	1.308
Verifying data	4	6.3	4	6.3	20	31.3	24	37.5	12	18.8	2.53	1.067
Disseminating to users	-	-	8	12.5	16	25	32	50	8	12.5	2.37	.864
Preparing and analyzing data	8	12.5	4	6.3	8	12.5	20	31.3	24	37.5	2.25	1.357
Developing school level indicators	4	6.3	4	6.3	16	25	12	18.8	28	43.8	2.13	1.228
Preparing school specific data collection format	4	6.3	4	6.3	12	18.8	8	12.5	36	56.3	1.94	1.258

Other equally important functions like developing school level indicators, processing and analyzing data, preparing school specific format, and data verification were reported as poorly done functions, their mean fall in the range of 1.9 to 2.44. The computed standard deviation result showed that a rating of the individual respondents was not deviated much. When the deviation result was compared among the whole items, again the difference was not significant. The deviation ranges on average from 0.864 to 1.357. Thus, all school respondents have similar view towards EMIS functions at their school.

It is important to note, however, that schools are expected to plan, manage, monitor and evaluate their performance. These activities require variety of data/information collected, analyzed, and stored for use at school level.

IIEP (2006) in this regard has pointed out that the demand on schools to be effective, to assess themselves and to take on new responsibilities entails various performance assessment methods to be used like school indicators (school abstract). This shows that, as there is decision making at schools, EMIS should apply at school with all its component activities. Tegegn (2003) briefly has explained the concept as, “at each point of administrative channel, they not only receive and pass information, but information is also processed, analyzed and used (p.36).”

The current study, however, has shown that important EMIS functions like preparing data collection format, verifying data, analyzing data, developing school indicators are overlooked. The share of schools in EMIS has been limited to providing data to the next higher-level administrative echelon. This means data processing and analysis is limited at schools. This finding concurs with that of Chapman and Mahlck(1993) that have pointed out local participants operate as only implementers rather than decision makers and the processing and analysis of data is of minor relevance to them. The finding thus, indicated that educational data/information has not lead to improved educational practice at levels where it matters most.

#### **4.2.1.2. EMIS Functions at WEO and ZED and OEB**

The organization structure can vary according to the organization of services and corresponding responsibilities and available human and material resources at each administrative level. EMIS is no exception. Owing to this premise, this sub section of the analysis tried to assess the functions performed by WEO, and ZED in the production of EMIS data/information. Thus, to examine the extent of performance, a questionnaire containing nine functions which were assumed as common to both were provided with sample respondents to be rated using a five point likert type scale having five to one points.

According to the response of respondents illustrated in table 6, identification and analysis of needs, preparing data collection formats, preparing and analysis, and developing indicators were poorly done functions. All the items in both groups of respondents had mean scores that fall with in 1-2.49 range. To the contrary, receiving reports from their proceeding lower levels, compiling reports and transmitting to their succeeding higher level had all a mean score of more than 3.5 for both groups. Since the observed value of t-test for each item indicated in the table do not show statistically significant difference(less than tabled value of 2.02 in absolute value), there was conformity of opinion among the groups, hence among the population. Thus, no justification existed to refuse that EMIS functions at both levels have equal performance level.

**Table 6:** Respondents View on EMIS Functions at WEO and ZED

functions	Score of respondents		GM	Independent t-test
	WEO (n=32)	ZED (n=16)		
	$\bar{X}$	$\bar{X}$		
Compiling reports	3.69	3.75	3.72	-0.133
Receiving data from immediate lower level	3.5	3.69	3.58	-0.513
Verification of data	2.65	2.63	2.64	-1.024
Developing indicators	2.44	2.31	2.37	0.394
Providing EMIS related trainings	2.25	2.31	2.28	-0.145
Preparing and analyzing	2.06	2.19	2.13	-0.313
Preparation of abstracts	1.94	2.25	2.09	-0.734
Preparing data collection formats	2.06	2.13	2.09	-0.176
Identification and analysis of information needs	1.97	2.38	2.01	-1.102

Authorities suggest that, aggregate data often mask underlying trends, which, if recognized, would lead to differentiated response on the part of decision makers. A key element in moving decision making closer to lower level administrations, then is providing managers at those lower levels with the information they need as input to their decision-making (Chapman & Mahlck, 1993). This indicates that decentralized system demands decentralized data use that requires not only receiving reports from lower levels and simply reporting to the next higher level after summarizing, but also processing and analysis, developing indicators and availing for internal use.

The study, however has found out that functions such as needs analysis, preparing questionnaires, verification of data, processing and analysis, development of indicators and disseminating to users were the missed element at woredas and zones, like that of schools. The interpretation is that woredas and zones assume themselves only to serve as summarizers and channels. The design of EMIS must incorporate decisions as to which must pass to another level, because little is gained by insisting that all the school data flows to the center. In a decentralized system of Administration, however all stakeholders must see themselves as collectors, providers and users of information.

**Table 7:** Respondents View on EMIS Functions at OEB

Functions	Rating scale of Respondents										$\bar{X}$	SD
	VH		H		AVE.		L		VL			
	f	%	f	%	f	%	f	%	f	%		
Receiving reported data from zones	7	43.8	6	37.5	2	12.5	1	6.3	-	-	4.19	0.911
Publishing abstract	6	37.5	7	43.8	2	12.5	1	6.3	-	-	4.13	0.885
Storing data /information	7	43.8	5	31.3	2	12.5	1	6.3	1	6.3	4.00	1.211
Preparing and distributing data collection questionnaire	7	43.8	4	25	3	18.8	1	6.3	1	6.3	3.94	1.237
Processing and analyzing data	6	37.5	4	25	3	18.8	2	12.5	1	6.3	3.75	1.291
Encoding and clearing data	4	25	5	31.3	4	25	2	12.5	1	6.3	3.56	1.209
Developing indicators	4	25	5	31.3	4	25	2	12.5	1	6.3	3.56	1.209
Interpreting data	4	25	3	18.8	5	31.3	3	18.8	1	6.3	3.38	1.258
Providing EMIS related Training to suppliers and Disseminating EMIS outputs	1	6.3	1	6.3	5	31.3	6	37.5	3	18.8	3.31	1.195
Providing feedback	3	18.8	3	18.8	4	25	4	25	2	12.5	3.06	1.340
Needs analysis Identification and analysis of information needs	3	18.8	4	25	5	31.3	3	18.8	1	6.3	2.44	1.094
Needs analysis Identification and analysis of information needs	1	6.3	1	6.3	6	37.5	7	43.8	1	6.3	2.43	0.957

As per the results in table 7, it could be possible to categorize the functions into three performance levels. The first category could be those performed at higher level, the second at average level and the third at low level. Those highly performed functions were preparing and distributing data collection questionnaires and formats (mean=3.94), receiving reported data form zones (mean=4.9), processing and analyzing (mean=3.75), storing data/ information (mean=4), and publishing abstract (mean=4.13). The second category of functions that were performed at average level, according to the response the respondents, were encoding and clearing data, interpreting data, developing indicators, disseminating to users and providing EMIS related training. Needs analysis, and providing feedback were functions categorized under low performance ranges (less than 2.5).

The computed standard deviation results reflected that the differences for all respondents lie on average in the range of 0.885-1.340, which can be considered as insignificant difference, because the deviations for all items are nearly one in standard measurement. The result guides us that the respondents of Oromia have conformity of perception towards the implementation of EMIS

functions. Thus, it could be safe to deduce that OEB perform most EMIS functions at higher level. However, needs analysis, and providing feedback to users remain to be functions performed below expectation. Concerning needs analysis Ross and Mahlck (1990) have suggested that the critical task in designing effective educational information systems is the identification and definition of information needs. Besides, EMIS should serve as monitoring and feedback devices that help the system to make corrections- some call this formative oriented EMIS. Carrizo, et al.(2003) also have affirmed that all EMIS functions be maintained because if one of them is missing or faulty it is the entire EMIS that will suffer. Thus, the OEB should pay attention to each EMIS functions, to come up with quality efficient EMIS out puts. Specifically, an assessment of information needs from user groups and the development of formative oriented EMIS.

#### **4.2.2. Design of Data Collection Questionnaire**

The corner stone of the data collection is the data collection questionnaire. The design of its format determines the type, amount and quality of data/information, and contributes a lot to the smooth flow of subsequent EMIS activities.

To look into the perception of respondents about the design of data collection questionnaires and formats, six major requirements were provided with the respondents to be rated on a Likert type scale having five scales involving strongly agree (5), agree (4), undecided (3), disagree (2), and strongly disagree (1).

Table 8 depicts that only the use of common definitions and terminology were perceived positively (GM=3.5) by respondents. Other requirements in the design of data collection questionnaire were rated below average mean. The ANOVA test of significance showed the existence of significant difference among the groups only on the item- the questionnaires match with school record keeping ( $p(0.010) < 0.05$ ). A close look at their mean indicated that schools and WEO respondents have shown their disagreement concerning the match with school record keeping where as ZED and OEB respondents recognized it as having average match and strong match respectively. Their perception difference appears that schools did not keep the record as appropriate as expected but they attributed to the wrong design of the questionnaire.

**Table 8:** Respondents View on the Design of Data Collection Questionnaire.

requirements of the questionnaire	Score of respondents								GM	F	sig
	School N=64		WEO (N=32)		ZED (N=16)		REB (N=16)				
	X	SD	$\bar{X}$	SD	$\bar{X}$	SD	X	SD			
Common definitions and terminologies are used	2.69	1.139	4.63	1.129	3.94	1.34	4.31	1.07	3.53	2.345	.452
Provided choices are mutually exclusive	2.58	0.968	2.96	1.105	2.75	1.2	3.64	.964	2.98	.895	.446
The form has clear physical lay out	2.41	1.33	2.38	1.431	2.19	1.12	2.75	1.52	2.41	.469	.705
Permit subsequent statistical analysis of data for reliability and validity	2.28	1.33	2.5	1.566	2.37	0.98	2.44	1.12	2.39	1.951	.19
The design matches with school record keeping	2.03	1.321	2.34	1.359	2.56	1.11	3.31	1.44	2.34	3.983	.010*
Retain data disaggregated at an appropriate level	1.88	1.148	2.19	1.176	2.38	1.24	2.44	1.43	2.15	20.34	.265

\* show significance at  $p < 0.05$

On all other items, ANOVAs test of mean difference highlighted that there is no ground ( $p > 0.05$ ) to reject the null hypothesis that the groups have similar perception, implying that the groups of respondents have similar attitude towards the design of data collection formats, hence the population from which the samples were taken.

A number of interviewee from OEB reported that data collection questionnaire was prepared at the ministry level and adopted to decentralized regional offices. Zones and woredas however indicated that:

*We don't have any hand in the design, evaluation or any other engagement related to the questionnaires and other formats except receiving as it comes and pass to the next level. This is all what we know about the questionnaire*

The met requirement for the questionnaires was only the use of common definitions and terminology in the questionnaire. This implies that the questionnaire was deficient in many of its aspects in achieving its expected functions. Hua and herstein (2003) have put in plain words that

the questions, lay out, and syntax should be well formulated together with users and producers. It must be treated as scientific process of fact-findings Earl, Macosh, and Rahman, (1982) also have informed that any system, which is designed with out the active support and involvement of people who have to use its out puts, will either fail, at best be mediocre.

The implication here is plain that the data collection questionnaire is deficient. Thus, there is a need to pay more concern on the design of data collection questionnaires. If not the oldadage ‘garbage in garbage out’ becomes the reality

### 4.2.3. Educational Information Available to Users at Different Educational hierarchies

Overall, a good EMIS must provide data/information services on ultimate outcomes, out puts and inputs that are consistent to one another and used for formulating policies and strategies, planning, monitoring and evaluation. With this premise, it is expected that there should not exist significant difference between EMIS levels in having key education indicators. This section, therefore, examines educational indicators available at each administrative level. In doing so, a list of possible indicators was presented to all respondents so that they show their agreement or disagreement on a five likert type scale represented by numbers from five to one.

**Table 9:** Respondents View on the Availability of Data/Information

Data/information	Score of respondents				GM	ANOVA	sig
	School (n=64)	WEO (n=32)	ZED (n=16)	REB (n=16)			
	X	X	X	X			
Promotion/graduation/Transition rates	4.38	4.44	4.56	4.69	4.45	0.431	.925
student teacher/student section/student text	4.47	4.44	4.06	4	4.35	2.663	.051
Enrollment rates by grade, age, sex	4.09	3.93	4	3.96	4.2	2.247	.086
Wastage ratios	4.17	4.19	4.06	4.25	4.17	0.092	.965
School facilities	3.41	3.19	3	2.31	3.16	2.795	0.48*
School age population	2.63	2.44	2.19	3.09	2.78	2.31	.078
Organized students achievement and accomplishment	3.28	2.69	2.63	2.59	2.8	21.489	.041*
Curriculum related data/information	2.5	2.41	2.43	2.45	2.45	0.412	.244
Resource utilization	2.72	2.28	2.31	2.25	2.39	1.002	.394
Qualitative data	2.5	2.53	2.63	1.37	2.25	2.693	.000*
Disabled students	2.25	2.19	2.13	2.13	2.20	0.58	.982
Per-students cost	2.16	2.06	2.19	2.31	2.16	0.171	.916

\* show significance at  $p < 0.05$

Table 9 depicts that data/information on student achievement and accomplishment, per-student cost; disabled students, resource utilization and curriculum related data/information were reported as data/information rarely available in EMIS at all levels of education. Besides, qualitative data/information was the rarely available ones in all the administrative levels of education. The mean scores of all the rarely available indicators fall within the range of 1.5 to 2.4. Other data/information mostly available were enrollment rates, wastage rates, school facilities, promotion rates, student teacher student-section and student textbook ratios.

The computed ANOVA test of significance at 95 confidence level showed that significant difference (P-value greater than 0.05) observed at items like the existence of qualitative data, the existence of an organized student achievements and school facilities data/information. Because the observed values on the items are all greater than the tabled value of 2.68. Based on pair wise comparison-HSD, the difference existed between region and the rest three levels. The non-availability of qualitative data at the region seems to be because of the use of ad-hoc reports that lower levels of administration use. These ad-hoc reports contain qualitative data such as reasons of dropouts, repeaters, and some comments and opinions on the system. These data/information could not go far up beyond zones. On top of this, the annual data collection questionnaire does not contain qualitative data. Thus higher decision makers, policy makers and planners are devoid of comments opinions and other qualitative data that could equip them more with planning and designing strategies.

An interview made with OEB Educational planning, budgeting and information system process owner has substantiated the result. He said that there have been monthly, semi-annually, quarterly, and annual reports in all respective levels that help to manage operations. Nevertheless, the problem is, the qualitative parts of the report have rarely been compiled, reported and used. They are archived at woredas and zones.

Concerning achievement data and cost-data that were found to be rarely available in EMIS of the region, Ross and Mahlck (1990) consistently have reported that absence of information on unit expenditures and academic achievements are pockets of absent information observed in many countries. On qualitative data Chapman and Mahlck (1993) as well have revealed that, only on rare occasions are schools are asked to generate information on qualitative aspects of teaching learning.

Education implies cost. Its management requires sufficiently detailed financial statistics to establish the budget and the accounting. Lack of cost data hampers relating education expenditure to the main economic and financial indicators. Besides, having examination results both national and grade level helps to control quality, efficiency, effectiveness and outputs of the system. Lack of this data, again, made the system unable to control the system. Disabled students are citizens. They deserve attention. Absence of data about this group of students indicates that they are not obtaining special treatments, and interventions that could have helped them to cope up with their counter partners. Curriculum data like the teaching learning process, and comments and opinion on its contents and design are also highly important, because curriculum related data/information helps decision makers at all levels to aware about the effectiveness of the curriculum materials and helps them to propose alternatives. Resource utilization indexes also have a greater share in finding out effects of different inputs on outputs.

The interpretation is that the majority of EMIS out puts at different educational levels were all about educational inputs, but little or no information about outputs and processes. EMIS focuses on the measurable or most easily quantifiable aspect. Thus, EMIS was not comprehensive, which means deficient in supplying necessary data/information to users.

#### **4.2.3.1. Formats in Which Education Information are Available at**

##### **Educational Echelons**

Dissemination formats can be an important aspect of EMIS by which it markets its products and improve its credibility by informing other government bodies and stakeholders about what data is available. The format of the information, however, must suit the requirements and capabilities of decision makers at different levels. This means that keeping and availing information in the format suitable to users should be the prior concern of EMIS management. In order to see the existing practice against this principle, respondents were requested to identify the format by which information is kept and made available to them from the assumed four formats given in their respective levels.

**Table 10: Respondents View on the Format by which Information is Available**

Format	respondents	Rating scale of respondents										X	$\chi^2$ test
		Always		Usually		Sometimes		Rarely		Never			
		f	%	f	%	f	%	f	%	f	%		
Hand written files	S	25	39.06	20	31.25	8	12.5	6	9.37	5	7.81	3.54	16.78
	w	12	37.5	7	21.87	6	18.75	4	12.5	3	9.37		
	Z	3	18.75	3	18.75	6	37.5	3	18.75	1	6.25		
	O	1	6.25	2	12.5	4	25	4	25	5	31.25		
Statistical year book	S	6	9.37	8	12.5	10	15.62	10	15.62	30	46.87	2.98	30.18*
	w	11	34.37	9	28.12	5	7.81	3	9.37	4	12.5		
	Z	6	37.5	4	25	3	18.75	2	12.5	1	6.25		
	O	7	43.75	5	31.25	2	12.5	1	6.25	1	6.25		
Printed document	S	8	12.5	7	10.93	10	15.62	21	32.81	18	28.12	2.77	19.96
	w	4	12.5	3	9.37	5	15.62	12	37.5	8	25		
	Z	5	31.25	5	31.25	3	18.75	2	12.5	1	6.25		
	O	6	37.5	4	25	2	12.5	3	18.75	1	6.25		
Electronic document	S	8	12.5	5	7.81	6	9.37	23	35.93	22	34.37	2.56	21.89*
	w	4	12.5	3	9.37	4	12.5	13	40.6	8	25		
	Z	2	12.5	3	18.75	6	37.5	3	18.75	2	12.5		
	O	5	31.25	4	25	3	18.75	2	12.5	2	12.5		

Note: S=school, W=WEO, Z=ZED, O=OEB

\* indicate Significance at  $P < 0.05$

Table 10 shows statistical yearbook was the most popular format by which data/information was available at WEO, ZED and OEB. The majority of WEO (62.49 percent), ZED (62.5 percent) and OEB (75 percent) respondents respectively responded that it was used usually or mostly in keeping data/information in their respective organization. On the other hand, a greater number of school respondents 62.49 percent replied that statistical yearbook was rarely or never used to keep information in their schools.

An interview held with bureau process owners, zone heads and woreda office heads assured the same. That was statistical yearbook was published only at bureau level and distributed only to some other sector bureau, zones, and woredas. They reasoned out that it became costly to publish copies so that it reaches schools.

The statistical yearbook of the region, however, has shortcomings. Firstly, it has been out of the principle that “this years’ data this year”. It had been published at least a year after a given academic year. For instance, the 2006/7 education data/information was published in November 2008, the 2007/8 data/information was published in March,2009 and the2008/9 and the 2009/0 year’s data/information was not yet published until this data started to be analyzed(April,2010). Secondly only few of the too many collected were analyzed in the abstract; thirdly, the analysis made in the yearbook was not in a manner usable to schools and woredas. Finally, the analysis did not show trends. Of course, there has been a good beginning in the 2007/8 yearbook that had tried to show long years trends.

Concerning electronic format, the majority of school respondents (70.3 percent) and of WEO respondents (65.6 percent) replied that they have rarely or never used electronic format in maintaining or availing information. About 37.5 percent of ZED respondents respond that they have used electronic document sometimes. Of the rest 62.5 percent of ZED respondents, half of them indicated the use of electronic document above average level and the other half below average.

In the current level of technological and economic development of the region, indeed, it is challenging to maintain, disseminate and even access education information electronically to the school level and even woreda level, because there are no computers and electricity in most schools, and some woredas. Attifield, et al. (2002) have expressed this problem as “In Ethiopia one would not normally find computers at education offices below region (p.19)”. No internet services are also there almost through out the region.

Surprisingly enough, as information from FGD, and interview revealed computers have served only word processing where it exists in some schools, woredas and zones. The reason was plain that many officers and experts were computer illiterate. In such environment that was, absence of infrastructure, computer, and skills required to work on computer, it appears to take longer time to exchange information through electronic devices. The implications are the need for facilitating technological infrastructure and capacitate individuals in computer skills if efficiency is required in EMIS.

Printed files were the most commonly used format by which education information was available at zones and regions as replied by nearly 62.5 percent respondents from each group of respondents. To the contrary, the majority of school respondents 60.93 percent and WEO respondents 62.5 percent indicated that printed files were either rarely or never used in availing education data/information.

Handwritten documents were found to be the dominant format used in schools and woredas as the response of 70.31 percent school respondents and 59.37 percent of WEO respondents confirmed. It was reported to be used as often as sometimes as to the response of 37.5 percent zone respondents. To the contrary, the majority REB respondents replied that hand written documents were either rarely or never used to keep education data/information in their organization.

The Chi-square test of significance at 0.05 levels was calculated .The result showed the existence of statistically significant difference in the proportion of the response of respondents along the response category concerning the use of statistical yearbook and electronic document formats, because the observed values at the two formats are greater than the tabled value of 21. The implication is there are relationships between statistical yearbook and electronic document format utilization and educational levels. The inspection of the observed frequency in each cell along each response category have disclosed that there was a difference between region and other groups of respondents about electronic documents and between woredas and others with regards to statistical year book. The difference could be due to the distribution of statistical yearbook only to WEO level. Besides, electronic document is used sometimes, rarely, and never at ZED, woredas, and schools respectively. To the contrary, it is used mostly at region. Printed files and handwritten documents are the most used format at zones, woredas, and schools according to the response of most respondents.

The limitation in the region's packaging and presentation of information results in the needs of many constituencies being ignored. Literature in this area suggest that the nature of the information and the way in which it is made available and kept should be tailor made for each level (Carrizo, et al., 2003). Ross and Mahlck(1990) have also recommend that the best existing education information systems provide wide range of information in the form of electronic and

print forms. The education data/information format in Oromia is, however, mostly paper-based, even so, not fairly distributed. Soft-copies are often disregarded. The use of softcopies makes storing, processing and communicating information easier, faster and efficient. However, the lower level administrative echelons had no choice of method of storage other than the hard file system. The use of hard files could have side effects. For instance, cross-indexing is difficult, accessibility is difficult for most users, easily deteriorated, occupy large space, its security is problematic, and inefficient. The implication is the need for adapting the format to different decision-making levels capacities and responsibilities. Besides, the use of faster and efficient technologies makes the EMIS efficient.

#### 4.2.3.2. EMIS Integration

There has to be relationship and flow of information between producers and users of information, and top decision-making bodies and schools. With this ground, respondents were requested to respond on whether integration activities were carried out or not in their respective organization. The views of the respondents were presented in table 11.

As to the response of 84.38 percent, 62.5 percent and 62.5 percent school, WEO and ZED respondents, there was no organized information base in their respective organizations. Where as the majority of OEB respondents have shown that there was an organized information base at bureau level.

**Table 11:** Respondents View on Data/Information integration

Items	Response category	Response rating scale of Respondents										$\chi^2$
		School		WEO		ZED		Region		Total		
		f	%	f	%	f	%	f	%	f	%	
Is there an Organized data	Available	8	12.5	8	25	6	37.5	9	56.25	31	24.22	24.97*
	Not available	54	84.38	20	62.5	10	62.5	4	25	88	68.75	
	Don't' know	2	3.12	4	12.5	-	-	3	18.75	9	7.03	
Is integration of EMIS made	Integrated	20	31.26	10	31.25	6	37.5	9	56.25	45	35.16	8.41
	Not integrated	40	62.52	18	56.25	8	50	4	25	70	54.69	
	Don't' know	4	6.25	4	12.5	2	12.5	3	18.75	13	10.16	
Direction of EMIS flow	Vertical	48	75	12	37.5	7	43.75	3	18.75	70	54.68	40.69*
	Horizontal	2	3.12	6	18.75	4	25	3	18.75	15	11.72	
	Diagonal	2	3.12	4	12.5	1	6.25	1	6.25	8	6.25	
	1 and 2	8	12.5	6	18.75	3	18.75	2	12.5	19	14.844	
	1,2, and 3	4	6.25	4	12.5	2	12.5	7	43.75	17	13.28	

Asterisks indicate Significance at P< 0.05

The absence of an organized information base is against the principle of decentralization, that state a key element in moving decision making closer to the level of schools, then, is providing managers at those lower levels with the organized information base they need as input to their decision making (Chapman & Mahlck, 1993). The plain reason is that safe storage and retrieval is possible where there is an organized information base. Besides, organized information base helps users to access all the required data/information at a single location with a minimum of effort and cost. The non-existence of an organized information base, on the other hand, makes access challenging and costly, which in turn hampers utilization.

Concerning, whether information is integrated or not, except 56.25 percent OEB respondents who agreed in the integration of information system, the overwhelming majority of the other group of respondents believed in the non-existence of information integration in their respective organizations. Nearly, about 30 percent of other group's respondents accepted the existence of information integration, which is not valid to conclude. Sharing information vertically, horizontally, among multiple sources, and across time is possible only if information is integrated systematically in several or one data files at all levels. The net result would be the existence of a single uniform EMIS in education system.

As for flow of data/information, 75 percent school, 37.5 percent WEO, 43.75 percent ZED and 18.75 percent OEB respondents uncovered that information flows vertically. Just about forty-four percent of OEB respondents replied that information flows vertically, horizontal and diagonally. Overall, 54.68 percent of the total respondents believed that information flows only vertically.

A chi-square test of significance highlighted that there was statistically significant difference among the groups about the existence of organized data/information base. The test at 8 df, and 95 percent confidence level resulted in 24.97 observed value which is greater than the table value of 21.03. The conclusion is, there is relationship between the presence of organized information base and educational levels.

An EMIS is a data and information system that pulls together and integrates many types of data from multiple sources, multiple levels multiple points in time to facilitate higher order data analysis and more thoughtful informed decision making and management (Cassedy, 2005). The

central idea is that, the sharing of EMIS outputs through organizing data/ information system is crucial to its use efficiently and effectively by multiple users, because merging files and producing relationship between input and output, identifying certain educational effects; and projection and simulations are possible when there is an integrated organized information base. However, data/ information integration in Oromia remains unpractical at lower levels. Hence, Capacitating EMIS mangers at all levels and introducing modern linkage technologies at all levels of education system require emphasis from EMIS managers.

#### 4.2.3.3. Demand for EMIS Outputs

Simply supplying information will fail in the absence of efforts to increase demand. EMIS must build on the underlying interests and goals of each stakeholder group (www. equip 123 net). One

of the basic questions of this thesis is concerned with demand. Thus, school respondents, and the other three office respondents were requested to rate the extent of demand on EMIS out puts form various bodies in their respective organization. In doing so a likert scale ranging from give to one was presented to the respondents. The scales are defined as: 5=very high 4= high 3= average 2= low 1= very low.

**Table 12:** Respondents View on EMIS demand at schools

clients	Rating scale of respondents										X	S
	VH		H		AVE.		L		VL			
	f	%	f	%	f	%	f	%	f	%		
Researchers	32	50	20	31.3	8	12.5	4	6.3	-	-	4.25	1.231
NGOs	16	25	12	18.8	20	31.3	12	18.8	4	6.3	3.37	1.228
Sch.administrators	8	12.5	8	12.5	24	37.5	20	31.3	4	6.3	2.94	1.097
Teachers	-	-	8	12.5	24	37.5	24	37.5	8	12.5	2.5	.873
Political decision makers	-	-	8	12.5	8	12.5	40	62.5	8	12.5	2.37	1.120
Othergovernment sectors	4	6.3	4	6.3	12	18.8	24	37.5	20	31.3	2.18	1.139
Parents and the community	4	6.3	8	12.5	4	6.3	8	12.5	40	62.5	1.87	1.327
students	-	-	-	-	10	15.6	16	25	38	59.4	1.5	0.987

\* indicate Significance at P< 0.05

The figures in table 12 show that the demand for EMIS outputs by students, parents and community, other government sectors, and political decision makers was low. Every units' mean score have fallen in the range of 0.05 2.49. School administrators (mean =2.93) and NGOs (Mean = 3.37) were reported as having average level demand for EMIS out puts. Teachers demand for EMIS outputs was a little more than low-level demand. It was researches who demanded EMIS out puts at higher level (Mean =4.25)

The computed standard deviations for each item also revealed that the difference among the respondents is just about one standard deviation for all items, implying that the opinion of respondents towards reflecting the existing stakeholders demand for EMIS was consistent. The conclusion is there was less demand for EMIS outputs at school. Part of the problem might be attributed to; firstly, less effort was made to transform data into usable information. Secondly, most information is not easily accessible due to either the format of data/information or capacity constraints of users. Thirdly, there is no information culture than relying on intuitive grounds for decision-making. Since less demand indicates less utilization, making data/information available alone does not guarantee that they will be used at this level. Less utilization in turn means data/information is not serving local level decision-making. There is a clear need to increase demand, utilization, and increase database management.

**Table 13:** Respondents View on Demand for EMIS Out puts

clients	Respondents and their mean score				ANOVA	sig
	WEO	ZED	OEB	GM		
EMIS workers with in the organization	3.56	3.87	4.5	3.94	3.584*	0.026
Researchers	3.63	3.81	4.43	3.96	2.721	0.074
NGOs	3.06	3.69	4.37	3.7	3.640	0.062
Administrators and experts within the organization	2.56	2.63	4.25	3.14	15.751*	0.000
Other government sectors	2.18	2.37	3.93	2.82	13.944*	0.000
Political decision makers	2.00	2.25	2.93	2.39	4.230*	0.019

\*indicate Significance at P< 0.05

The figures in table 13 show that at region, the demand for EMIS outputs by all clients was found to be high (greater than 3.9 each). Political decision makers were reported to have average level demand (2.93). At woredas and zones, however, the extent of demand for EMIS outputs on the part of respective organs was not like that of the regions. Administrators and experts within the organization have average level demand at both levels; whereas, other respective government sectors and respective political decision makers demand for EMIS outputs was reported to be low. ANOVA test of significance at ( $F_{(2, 12)} = 3.67$ ) at 95 percent significance level, furthermore, highlights the significant difference that existed between the groups on items two (observed  $F=15.751$ ), three (observed  $F= 13.944$ ), and four (observed  $F=4.230$ ), which are far beyond the table value of  $F=3.67$ . The post hoc ANOVA test identified the difference to be between woredas and region and between zones and region. Thus, there was the region versus the other two -WEO and ZED dichotomy in demand for EMIS outputs. The inspection made on their means to identify where the difference lies clearly shows that, there was higher demand at region and less demand at woredas and zones.

The lesser demand at woredas and zones; and the higher demand at region might be attributed many factors. Firstly, the design of information system may not be as to serve local level decision makers. Secondly, most education decisions in education are always made within the larger social and political context that minimizes their need for factual data at lower administrative levels. Ross and Mahlck (1990) have supported this inference in that in education systems where decision making is still political or ad-hoc process the data collected, however, relevant are often never referred to. Thirdly, data/information is less accessible at lower levels than at the upper ones. Fourth is data/information illiteracy of most local users. Lastly, there has been low awareness on local authorities to use data for decisions at their discretion power rather than supplying data/information for central decision-makers.

Overall a hard work is expected from OEB in general and EMIS managers in particular in increasing demand for EMIS outputs, and hence utilizations at all administrative levels. The development of data based argument is the priority. Because, no rationale exists to produce EMIS outputs where there is no demand for it.

#### 4.2.4. Utilization of EMIS out puts

The explicit goal of most educational information is to assist clients in obtaining and utilizing information to improve educational practice and aid in educational decision-making. The question, however, is to what extent EMIS outputs are utilized as an input to decision making in the study region. In answering this question, seven major utilization areas were presented to respondents so that they rate the extent to which they use in their respective levels. To give final conclusion to the EMIS outputs use in specific utilization area, responses under 'always and mostly' were used as high utilization, 'sometimes' as average and the rest two 'rarely' and 'not used' as low utilization.

**Table 14:** Respondents View on EMIS Outputs Utilization

Utility area	Respo ndents	Rating scale of respondents										GM	$\chi^2$	sig
		Always		Mostly		Sometimes		Rarely		Never				
		f	%	f	%	f	%	f	%	f	%			
Reporting to those in need	S	20	31.25	28	43.75	6	9.37	6	9.37	4	6.25	3.81	7.087	0.852
	w	12	37.5	10	31.25	2	6.25	6	18.75	2	6.25			
	Z	5	31.25	6	37.5	3	18.75	2	12.5	-	-			
	R	6	37.5	4	25	3	18.75	2	12.5	1	6.25			
Management of operations	S	24	37.5	3	28.12	6	9.37	10	15.6	6	9.37	3.61	8.390	0.754
	w	12	37.5	18	28.12	3	9.37	3	9.37	4	12.5			
	Z	6	37.5	9	31.25	1	6.25	1	6.25	3	18.8			
	R	5	31.25	5	25	2	12.5	1	6.25	4	25			
Evaluating performance	S	6	9.37	4	12.5	30	46.9	10	15.6	12	18.75	2.98	20.651	0.056
	w	1	3.12	8	9.37	20	62.5	4	12.5	4	12.5			
	Z	2	12.5	3	12.5	10	62.5	1	6.25	2	12.5			
	R	6	37.5	24	25	3	18.6	1	6.3	2	12.5			
Facilitating educational planning	S	12	18.8	4	6.25	8	12.5	24	37.5	16	25	2.64	26.173*	0.01
	w	4	12.5	4	12.5	6	18.75	12	37.5	6	18.8			
	Z	2	12.5	4	25	3	18.75	2	12.5	5	31.25			
	R	7	45	4	18.75	2	12.5	1	6.25	3	18.75			
Monitoring progress	S	10	15.62	4	10.93	10	15.62	15	23.4	22	34.37	2.58	20.651	0.056
	D	2	6.25	7	18.75	4	12.5	6	18.8	14	43.75			
	Z	1	6.25	6	12.5	3	18.8	2	12.5	8	50			
	R	2	12.5	2	25	3	18.8	2	12.5	5	31.25			
Allocating resources	S	-	-	6	9.37	10	15.62	14	21.87	34	53.12	2.46	53.954	0.000*
	w	4	12.5	6	18.75	2	6.25	16	50	4	12.5			
	Z	-	-	2	12.5	4	25	5	31.25	5	31.25			
	R	5	31.25	6	37.5	2	12.5	2	12.5	1	6.25			
Developing programs and projects	S	4	6.25	2	6.25	6	9.37	44	68.75	8	12.5	2.34	42.514	0.000*
	w	2	6.25	2	6.25	6	9.37	10	31.25	12	37.5			
	Z	-	-	-	-	3	18.75	11	68.75	2	12.5			
	R	5	31.25	4	25	2	12.5	4	25	2	12.5			

S=School, w=Woreda, Z=Zone, and R= Region

\* indicate Significance at P< 0.05

As it can be seen from table 14, the use of data for various management functions of education has gone on increasing from school up the region except management of operations; which is in reverse direction. That means their uses for management of operations were higher at schools and woredas.

A close look at individual utility areas indicated that the use of EMIS outputs for planning purposes; according to the response of 75 percent school respondents, 75 percent WEO respondents, 62.5 percent ZED respondents was found to be as often as sometimes and below. On the other hand, nearly 64 percent of OEB respondents replied that EMIS outputs were used for planning purposes as often as usually and above. With twelve degrees of freedom the obtained chi-square test of proportion of 26.173 exceeds the critical value of 21.03 at alpha 0.05 levels, leading to the rejection of the null hypothesis that the response proportions for all groups are equal in each cell. Meaning that there exist no justifications to say that EMIS outputs are used at similar degree at all levels for planning functions. Inspection of the observed table frequencies indicated that the EMIS outputs are underutilized for planning at WEO and ZED, which means planning functions lack data arguments at those levels. This could in turn result in lack of where to start, and where to reach, which is similar to flying blind.

As for management of operations, nearly more than 60 percent of each respondent's group indicated that EMIS outputs were used for management of operations as often as mostly and always. The calculated chi-square result ( $X^2_{(12)} = 8.390$ ,  $p > 0.05$ ) also showed that there was statistically no significant difference among the levels about the use of data/information for management of operations.

Concerning monitoring progress, more than three fourth of each respondents group replied that EMIS data/information were either not used or rarely used to monitor progress. Similarly, more than half of the respondents from OEB (53.75 percent) indicated that, the EMIS data were rarely used or never used to monitor progress.

Monitoring is an essential management function that requires up-to-date data. It monitors progress against set standards or plan goals. Monitoring could indicate areas where interventions or

corrective measures are in need. Monitoring without data is impossible. Monitoring should be connected to data and data to plan and standards. The chi-square test ( $\chi^2_{(12)} = 20.651$ ,  $p > 0.05$ ) of significance shows that no significant difference was observed among the levels with regards to the use of EMIS outputs for monitoring and evaluation. The interpretation is the EMIS of the region does not play formative role at all levels without any opinion difference among the respondents.

Concerning the use of data/information for evaluation of performance, as perceived by 46.87 percent school, 62.5 percent woreda, and 62.5 percent zone respondents, the use was as often as sometimes and above. Whereas, nearly 60 percent of region respondents reflected that the data was used for evaluating performance as frequently as usually and always.

The use of EMIS outputs for reporting purposes was felt as positive in all groups of respondents. Seventy-five percent, 68.75 percent, 68.75 percent and 62.5 percent respondents of schools, woredas, zones and regions respectively reported that EMIS outputs were used for reporting functions. EMIS outputs use in reporting was higher in all levels when compared to other usage areas. A chi-square result ( $\chi^2_{(12)} = 7.087$ ,  $p > 0.05$ ), furthermore, highlighted the non-existence of statistically significant difference among the levels, which means there was no relation between levels and the use of data for reporting purposes. This result has an implication that there has been an organizational mandate that force all levels to report weekly, monthly, quarterly, and yearly to their successive upper administrative levels. Thus, no difference was observed among the levels.

Concerning the use of EMIS outputs to develop programs and projects, 81.25 percent school, 68.75 percent woreda, and 81.25 percent zone respondents showed that education data/information either rarely or never used to develop programs and projects. On the contrary, 56.25 percent OEB respondents showed that they have used as often as always or mostly in developing programs and projects. A Chi-square test of significance at ( $\chi^2_{(12)} = 42.514$ ) also portrayed the existence of significant difference among the groups, because the obtained F ratio is well beyond 0.05 level critical ratio.

Therefore, it could be concluded that the use of data for the development of programs and projects relates with educational levels. The difference in sensitivity of the groups could lie on the view that zones, woredas and schools do not consider themselves as designers of programs and projects than implementers. This is a wrong perception in a decentralized system of administration. They could do so in collaboration with higher-level experts and NGOs with out ignoring the general ministerial or regional level policy framework.

About the use of data/ information for allocating resources more than 62 percent of school, WEO, and ZED respondents responded that the use of EMIS outputs to allocate resources was either rarely or never. To the contrary, nearly 70 percent of REB replied that EMIS outputs were used to allocate resources. A Chi-square test of proportion also portrays that significant difference existed among the groups, having the implication that there exist relationship between levels and the use of data for resource allocation. The difference, according to the observed table frequencies, seems to exist between zone and region, because zones have no responsibility to allocate resources due to decentralized system of decision-making. Again, the difference appears to exist between woredas and region .This indicates that woredas are allocating resources based on intuition than data/information.

An assessment of data use in the region clearly showed that EMIS outputs were underutilized in areas where it should be used to the maximum, like planning, monitoring, allocating resources and development of programs and projects. Relatively there has been better use of data at regions in almost all utility areas. This finding concurs with that of Chapman and Mahlck's (1993) and Ross and Mahlck's (1993) that have pointed out EMIS use in developing countries are often limited to office of the ministry. They further put the reason that in traditional organizations most important public education decisions are made at the national level.

The uses of data in educational decision, however, are expected to span all layers of the education system from federal to the state, woreda, school and classroom levels. Forojolla (1993) has clearly put that the collection and analysis of educational statistics are expensive in terms of time and energy spent in acquiring them. This can only be justified if they can be used in making decisions realistically at any decision-making level.

The implication to Oromia education bureau is thus, the need to reconsider its EMIS and promote the appreciation and use of data driven decision making at all levels of the system. There is also a need to ensure close links between data collection and utilization particularly at decentralized administrative levels. More over, auditing the extent of education data /information use has contribution to take intervention

#### **4.2.4.1. Barriers to EMIS output Utilization**

Availing information does not guarantee utilization, because utilization of data is constrained by many factors. The factors could be from its supply side or demand side or both. Thus, a vital step towards improving data based decisions is identifying the factors and finding solutions to the constraints. What are the barriers is the prior question. Some of the assumed barriers were presented to the respondents in a likert type scale having indicators very serious (5), serious (4), moderate (3), less serious (2) and not a problem (1). The respondents rated as they felt, and the result was presented in table 4.15.

At first glance at table 15, one could observe that low level of data analysis and low technical capacity of users and EMIS staffs, as perceived by all groups of respondents, were serious hindrances to data use. Low quality of data, and lack of access to extract data were perceived variably by respondents as either serious or moderate and the remaining two-perceived effect of data use and organizational culture and leadership were commonly perceived as moderate hindrances to data use.

When closely examined, the majority of respondents that was 65.52 percent, 62.5 percent, 68.5 percent and 68.75 percent of school, WEO, ZED and REB respondents respectively rated low level of data analysis under either serious or very serious problem. As literatures put it, when the information made available becomes too gross a level to provide guidance it limits utility. Level of aggregation should be broad or detailed based on unit of analysis (for instance, woreda, school, parents, and teachers) or on level of administration.

**Table 15:** Factors Hindering the Use of EMIS Outputs

Barriers	Respon den ts	Rating scale of respondents										X	$\chi^2$
		Very serious		serious		Moderate		Less serious		Not a problem			
		f	%	f	%	f	%	f	%	f	%		
Low level of data analysis	S	26	46.3	21	32.8	12	18.75	3	9.37	2	6.25	3.93	4.3821
	W	12	37.5	8	25	6	18.75	4	12.5	2	6.25		
	Z	7	43.75	4	25	3	18.75	2	12.5	-	-		
	R	5	31.25	6	37.5	3	18.75	1	6.25	1	6.25		
Poor data quality	S	8	12.5	6	9.35	24	37.5	16	25	10	15.62	3.27	27.3374*
	W	10	31.25	10	31.5	6	18.75	5	15.62	1	6.25		
	Z	7	43.75	3	18.75	1	6.25	3	18.75	2	12.5		
	R	6	37.5	5	31.25	3	18.75	2	12.5	-	-		
Lack of access to extract data	S	30	46.2	14	21.87	10	15.62	6	9.37	4	12.5	3.66	15.7934
	W	10	31.25	9	28.12	6	18.75	3	9.37	4	12.5		
	Z	5	-31.5	5	31.25	2	12.5	3	18.75	1	6.25		
	R	-	-	4	25	7	43.75	3	18.75	2	12.5		
Organizational culture and leadership	S	14	21.87	8	12.5	24	37.5	12	18.75	6	9.37	3.05	1.9517
	W	5	15.62	4	12.5	11	34.37	7	21.87	5	15.62		
	Z	2	12.5	2	12.5	8	50	3	18.75	1	6.25		
	R	1	6.25	2	12.5	7	43.75	4	25	2	12.5		
Perceived effect of data use	S	2	3.12	10	15.62	30	46.87	15	23.43	7	10.9	2.88	1.9517
	W	4	12.5	5	15.62	14	43.75	6	18.75	3	9.37		
	Z	1	6.25	3	18.75	6	37.5	4	25	2	12.5		
	R	2	12.5	3	18.75	7	43.75	2	12.5	2	12.5		
Low technical capacity of users and EMIS staff	S	25	39.06	19	29.68	8	12.5	6	9.37	6	9.37	3.8	0.8171
	W	13	40.6	9	28.12	5	15.62	2	9.37	3	9.37		
	Z	7	43.75	3	18.75	3	18.75	1	12.5	2	12.5		
	R	6	37.5	4	25	3	18.75	2	6.25	1	6.25		

Note: S=School, W=Woreda, Z=Zone, and R= Region

\* indicate Significance at P< 0.05

About lack of technical skills of users and EMIS staff, there observed common harmony among respondents. Chi-square( $\chi^2_{(12)} = 0.8714$ ) test of significance also pointed out the same. The calculated value is by far less than the table value  $\chi^2 = 21.03$ . Nearly more than 60 percent of each group of respondents expressed their perception that it is either serious or very serious problem to data use. Carrzo, et al. (2003) consistently has explained that EMIS users and producers lack adequate skills and knowledge to formulate questions, select indicators, interpret results and develop solutions.

Concerning organizational culture and leadership, 37.5 percent, 34.35 percent, 50 percent and 43.75 percent of school, WEO, ZED and REB respondents respectively felt that the existing culture and leadership hinder data use at moderate level. Like wise, almost more than 40 percent of each groups of respondents looked at perceived effect of data use as a moderate hindrance to data use. Effective data informed decision-making requires not only access to useful data but also well-designed supports such as leadership to model data use and supported time for reflection on data. Managers with strong commitments to data driven decision making and norms of openness and collaboration fostered data use. The need for active and enlightened leadership is plain. The culture of not viewing data as useful for informing decisions as well affects the extent of data use.

#### **4.2.5. Quality of Data/information**

Having quality product increases the number of its users. An increase in the number of users implies an increase in the level of data driven decision-making. How quality of data/information measured is the question of many. Indeed, measuring quality has remained difficult in many production as well as service giving organizations. However, literatures existing around data/information quality use content, timeliness and the format of presentation as indicators to evaluate quality (O'Brien, 1998). This section also tried to investigate EMIS out puts quality in terms of content, form and timeliness. In doing so, the respondents were supplied with three major indicators and nine minor indicators to rate in a likert type scale involving very high (5), high (4), medium (3), low (2) and very low (1).

The figures in table 16 show that the computed means of respondents' response on quality of data/information go on decreasing up the educational hierarchies almost in all components of quality indicators.

The treatment of individual indicators showed that the respondents evaluated relevance, clarity and frequency of educational data at average quality level (2.5-3.49). Respondents put every other indicators of quality below average quality level (less than 2.5). When compared among the group, schools and WEO nearly looked at accuracy at average quality level, where as, zones and region looked it at low quality level. This perception difference could be seen from two perspectives

**Table 16: Respondents Views on the Quality of EMIS Data/Information**

Indicators of Quality		Mean score of respondents					ANOVA	sig
major	minor	School (n=64)	WEO (N=32)	ZED (N=16)	OEB (N=16)	GM		
content	Relevance	3.03	3.00	2.94	3.31	3.06	.246	.864
	Completeness	2.93	2.42	2.12	2.25	2.48	1.924	.057
	Accuracy	3.34	2.44	2.31	2.06	2.44	6.205	.001*
Form	Detailed ness	2.71	2.62	2.5	2.5	2.58	.187	.905
	Presentation	2.46	2.47	2.3	2.37	2.46	.068	.977
	Clarity	2.75	2.56	2.62	2.81	2.31	.120	.948
timeliness	frequency	3.4	2.56	2.37	2.31	2.86	1.99	.053
	Currency	3.34	2.87	2.43	2.37	2.75	2.33	.034*
	Timeliness	2.06	1.81	1.68	1.62	1.79	1.430	.0591

\* indicate Significance at  $P < 0.05$

One, schools and woredas are sources of data, thus due to their vested responsibility and accountability for data accuracy, they evaluate it positively with preset mind to overcome accountability. Second, as data pass through administrative pyramid there could be high probability of the introduction of errors at each level up. The cumulative effect reaches its climax at higher levels of the system and makes the quality rather poor.

The computed ANOVA have showed that significant difference was observed only on accuracy at 0.001 significance levels and currency at 0.034 significance levels. Both p-values are less than 0.05 levels. No significant difference existed on any other factors. This means almost no difference of opinion existed among schools, woredas, zones, and the region on data quality, hence; inference to the population is possible with 95 percent confidence level.

FGD and interview conducted with PTA and officials (Bureau process owners, zones and woredas heads and the previous EMIS unit head) substantiate the result. They rose that data/information accuracy, timeliness, and presentation have got of course an inherent quality problem. Content wise the previous EMIS unit head expressed his view like:

*To the best of my experience in that unit, I have never seen an error free EMIS data/information. What ever efforts were made to clear it, while encoding, processing, compiling; at the end of the day when made ready for disseminations, unexpectedly you begin to see big errors in the first few pages of the abstract. Monthly, quarterly, semi-annual and annual reports are not exceptional.”*

The informant's conclusion was that “EMIS work could not be error free”. Discussion groups also have forwarded similar view. They explained that data accuracy is impossible because intentionally or unintentionally people make errors at every step EMIS activities and administrative levels. They agreed on the point that compromising figures with targets have some direct or indirect impact (negative, positive) on those involved particularly the organization heads. An interview with OEFB plan expert also revealed the unreliability of education data/information that comes to their bureau. According to their view, private interest of the authorities has a greater share in the inaccuracy of data/information.

Timeliness wise, all discussion members and interviewees agreed that EMIS outputs never served the year it is intended to serve. Most often abstracts were made available at least a year after it is collected. Similarly, monthly, quarterly, Semi-annual and annual reports delay on average a week at any administrative level. When reached its final destinations, (mostly REB or MOE), it is common that there could be a delay of not less than a month from its reference date which means, it is dead on arrival.

In a careful examination of the 2009/10 filled data collection questionnaire and information obtained from the 2009/10 data encoders, the following problems are obtained. These are coding errors, misplacement, wrong figure, incomplete items, summation error, and wrong information. Surprisingly enough, one school reported that there are 242 latrines in the school. The other school also reported that the educational level of all the schoolteachers is tenth complete. Concerning the physical layout of the questionnaire there observed congestion of the items in the questionnaire to reduce cost. This could increase the probability of errors while filling. Overall, Out of the examined seven woredas' questionnaires 41 different types of errors were observed. Some of the errors were plain wrong.

The reliable production of data/information suggests that EMIS data once produced must reliably report a current reality, status, or trend of change. Lack of data/information quality could be a serious problem on data use. Firstly, timeliness, form and content can affect the level of information user confidence and trust in the data. Secondly, delay, inaccuracy and unsuitable form can easily lead to lack of data use. It is for this reason that Carrizo, et al. (2003) has put the principles of data as completeness, exact, sufficiently detailed, and timely; and should be relevant from the respective of the users.

The current study however came up with Oromia education data/information lacking completeness, accuracy, and timeliness. Besides, it is presented to users in the form, which is not easily accessible and understandable. In principle, rather than using deficient data, it is by far better to use no data, because low quality data/information may become misinformation or lead to invalid inferences. Possibly poor data quality reflects the insufficient human material and technological capacities. The implication is the need to improve data accuracy, completeness, presentation and timeliness so as to improve decisions. A number of control steps need to be taken to ensure the data/information quality.

#### **4.2.6. Organizational Development and Capacity Building**

To enhance the effectiveness and efficiency of the delivery system of EMIS operations organizational development and capacity building activities play a pivotal role. The next section treated how is it made practical in EMIS of Oromia. Accordingly, respondents were asked to score ten items on a five point scale involving strongly agree (5), agree (4), undecided (3), disagree (2) and strongly disagree (1).

As shown in table 17, activities such as existence of systems, procedures and structures; institutional reforms, job description, clear working relationships existed in the system, according to the mean response of majority of office respondents- woreda, zone, and region (Mean that ranges from 3.18 to 4.5 for each activities in an increasing score up the echelon). On the contrary, schools have shown their disagreement concerning the practicability of the items. They rated at the mean of less than 2.5, suggesting the activities were poorly done.

and financial resources and remuneration packages were all perceived similarly by all groups of respondents as opposed to other activities. Their grand mean individually fall in the range of 0.05-0.249. The computed ANOVA between the groups, furthermore, highlights the nonexistence of significant statistical difference among the groups on the items. The P-value for each item is greater than 0.05.

Thus, EMIS activities in the region were found to be carried out with ill-qualified personnel and with deficient resources. Besides, the personnel in EMIS carried out such bulky and tiresome activities with no remuneration. The problem was rather severe at lower hierarchies. The greater concern of institutional development and capacity building appears to be that of higher-level hierarchies in some capacity development areas. Still, some of the capacity development practices were found to be poor in all levels of the system. Such lack of attention, specifically at schools, woredas, and zones could make schools feel no sense of ownership. Worse than this, it could make them lack skills and commitment to education data collection, analysis and utilization. The cumulative effect could be less quality EMIS output.

Institutional building and capacity development are closely associated with all stages of data collection, analysis and utilization and should be the concern of all levels of the education system. The deficiencies, therefore, assume designing comprehensive package of capacity building activities and organizational development practices at all levels of administration to enable and build an efficient EMIS system, and to create a strong demand for EMIS outputs.

#### **4.2.7. Factors Affecting EMIS Management**

A number of problems beset the EMIS management. To propose solutions and strive for interventions there is a need to identify the problems, because solutions are possible only after problems are identified. In doing so, respondents were provided with major assumed institutional, and resource factors that could affect EMIS management. The factors were presented in a likert type scale. The scales were defined as 5= very serious, 4= serious, 3 = moderate, 2 = less serious and 1 = not a problem. The total frequencies of each scale were changed to percentages and corresponding means scores. Finally, the mean scores were set in rank order. To put in rank, the mean scores of offices (WEO, ZED, and REB) were changed to grand mean.

**Table 18:** Rank Order of Factors Affecting EMIS Management as Perceived by Schools and Officials

factors	Mean scores and rank							D	D <sup>2</sup>
	School n=64	Ran k	DED n=32	ZED n=16	REB n=16	GM	Rank		
	$\bar{X}$		$\bar{X}$	$\bar{X}$	$\bar{X}$				
Low technical capacity of EMIS staff	3.65	1	3.62	3.56	3.5	3.56	2	-1	1
Difficulty to keep skilled technical staff	3.62	2	3.54	3.6	3.66	3.6	1	1	1
Problems related to data Preparation and analysis	2.21	3	3.5	3.56	3.5	3.52	3	0	0
Poor ICT infrastructure	3.53	4	3.5	3.56	3.44	3.5	5	-1	1
Poor information culture on the part of users	3.59	5	3.37	3.25	3.93	3.51	4	1	1
Absence of clear data/information policy	2.81	6	2.81	2.75	3.06	2.87	9	-3	9
Lack of data/information integration	2.84	7	2.68	2.31	2.18	2.39	10	-3	9
Poor design of data collection questionnaire	2.78	8	2.18	2.25	1.87	2.1	11	-3	9
Poor data quality	2.65	9	3.12	3.25	3.37	3.24	7	2	4
Delayed submission of reports	2.59	10	3.25	3.25	3.93	3.47	6	4	16
Problems related to software	2.31	11	2.87	3.25	3.43	3.18	8	3	9
Lack of incentives for those involved in EMIS activities	3.56	12	1.87	1.93	2.87	2.22	12	0	0

$$\text{Spearman rank correlation coefficient, } \Gamma_s = 1 - \frac{6\sum D^2}{n(n^2 - 1)}$$

$$\Gamma_s = 1 - \frac{6(60)}{12(144 - 1)}$$

$$\Gamma_s = 1 - \frac{360}{1716}$$

$$\Gamma_s = 1 - 0.2$$

$$\Gamma_s = 0.08$$

As can be seen from table 18, the two groups of respondents have felt all the listed hindrances to EMIS management as moderate, serious and very serious. It was also observed that the mean scores of school principals were higher than those of educational officials', indicating that the former than the later felt the problems more.

Close analysis of individual factors showed that difficulty to keep skilled technical staff, low technical capacity of EMIS staff, and Problems related to data preparation and analysis, poor ICT infrastructure and poor information culture on the part of users of information were ranked 1 to 5 by both groups of respondents. Each of the items has mean scores greater than 3.5, which means the challenges are felt as serious. However, there has been slight difference in the ranking of the groups.

Difficulty to keep skilled technical staff and low technical capacity of EMIS workers came first and second by educational officials and experts and vice versa by school principals. A study by Forojalla (1993) consistently has revealed that shortages of skilled statisticians are the case in most African countries. They are in short supply in education system that makes the demand for them very high in the sector as well as in others. In such condition, therefore, it is unlikely to think that skilled statisticians serve schools, woredas, zones, and even region where their demand in high paying organizations are high. The same happened to the EMIS of Oromia. This problem is exacerbated by lack of incentives that ranked 3 by both groups of respondents. Not only are the skilled statisticians but also there are no experienced EMIS staff -only 21.87 percent have greater than 6 years of service. (Look at table 3.)

In most cases, data processing and analysis requires greater talent, which again requires equivalent incentives. When these do not exist, skilled statisticians leave the position in search of better paying jobs. This in turn forces the organization to employ less skilled and less experienced personnel in the post.

Poor ICT infrastructure and low knowledge on the part of users of information were put in rank of 4 and 5 respectively by school principals and put in rank of 5 and 4 respectively by educational officials. The problem of ICT appears to emanate from the fact that computers are rarely accessible to schools especially in primary schools. They are also in short supply at woredas and zones. As for low knowledge; users, parents, teachers, and even experts themselves have not developed awareness to the level of data based management. Use of technology fastens the EMIS activities and minimizes the rate of error. Thus, the need to automate schools and to develop information culture on part of users requires immediate action.

The next factors ranked 6 to 9 were absence of clear policy, lack of data/information integration. Poor design of data collection questionnaire and poor data quality. Educational officials on the other hand ranked delayed submission of reports, poor data quality, problems related to software and absence of clear data/information policy 6 to 9. Problems related to delayed submission of reports, problems related to software and lack of incentives for those involved in EMIS activities were ranked 10 to 12 by school principals with mean scores less than 2.5 each. Educational officials and experts however, put lack of data integration, poor design of questionnaires and lack of incentives for those involved in EMIS activities were ranked in rank of 10 to 12.

The estimation of the amount of correlation between the two sets of ranks is 0.81. This value is also found to be significant beyond 0.05 levels, since the observed value 0.81 is far beyond the tabled value of 0.591. Meaning that, the seriousness of the factors is not at the same level in all educational levels.

When the problems were evaluated with their mean score, only poor design of questionnaires, and problems related to data integration have less than 2.5 mean score according to officials. Whereas, school principals put the problems of data preparation and analysis and software problems at less than 2.5 mean. Roughly, the lesser mean score indicated the low level of seriousness of the problems. Nevertheless, in real sense it might be due to the deep-rooted wrong assumption that data preparation and analysis, and the use of software are only the responsibilities EMIS at the region/. These assumptions are directly related to the low demand and low utilization rate of EMIS outputs at schools.

An interview and FGD held with interviewees and discussion members resulted in almost the same factor listed in table 4.10 above. PTA members particularly emphasized poor data quality as one of the major hindrances to EMIS data/information management. A participant from one school explained the cause for poor data quality as follows who was not willing to be quoted by name.

*There has been a prevailing culture of additions and subtractions of figures at not only schools but also higher level officials and authorities. For example, schools report enrollment figures to woredas after subtracting some numbers to balance the expected dropouts. Both homeroom teachers and school principals maintain keeping such figures. The figures are informally called 'scorta'. Such illegal and unethical practices are to gain personal benefit. Similar practices have been started about student achievement result since the introduction of school improvement program.*

Besides, OEB EMIS process owner particularly stated EMIS management problems like poor data quality, soft ware problems, lack of skilled work force delayed submission of reports and problems related to data encoding. He attributed the cause for delayed submission of reports to the effect of unorganized record keeping at schools, low commitment of school principals in filling the questionnaires due to lack of incentives for doing so, and sometimes due to lack of clarity of the items in the questionnaires. In addition, he ascribed problems of data entry to the fact that encoders are paid as per the number of pages they enter, hurriedness becomes evident. Unnecessary hurriedness cause many errors that make verification lengthy that could lead to delay.

## CHAPTER FIVE

### 5. SUMMARY, CONCLUSION AND RECOMMENDATIONS

#### 5.1. Summary

The main purpose of this study was to look into the practices of EMIS management in Oromia and point out the prevailing problems and to suggest alternative solutions. In order to achieve what the study aimed at the following basic questions were set.

1. To what extent do EMIS functions apply at all levels of education?
2. What are the major education data/information available to users?
3. To what extent are educational information used for management, planning, and monitoring and evaluation of the system.
4. What is the status of EMIS quality in the region in terms of content, form, and timeliness?
5. What are the major problems that impede the management of EIS in the region?

In light of the basic questions, the specific objectives targeted were:

- To scrutinize the extent of relevance, reliability, timeliness and comprehensiveness of educational information of the region.
- To spot the major EMIS functions performed at schools, WEO, ZED, and region.
- To review the EMIS outputs existing in schools, WEO, ZED, and region.
- To identify the format in which education information is made available to user
- To review the education information utilization of clients for decision-making activities.
- To spot major factors hindering the utilization of education data/information
- To pin point major factors affecting EMIS management.
- To propose solutions that could solve the identified problems.

The study was conducted in 6 Zones, 2 city administrations, 17 woredas and 72 schools. The study areas were selected based on stratified and simple random sampling, but the individual respondents were taken on purpose from each institution because all the statisticians at the

respective institutions were samples. The intended samples were 20 OEB EMIS staff and the bureau process owners, 16 ZED statisticians, 34 WEO statisticians, and 72 school principals. But, those who actually participated were 16 OEB EMIS staff, 16 ZED statisticians, 32 WEO statisticians, and 64 school principals. As a result, out of 142 intended sample respondents 128 were participated (90.14%). Three ZED heads, 3 WEO heads, three school deputy heads and 2 OEB process owners were involved in the study through interview. In addition, 20 PTA members from three schools were included in the Focus Group Discussion. To establish the theoretical roots of the study and to integrate the findings to the body of knowledge related literatures and some countries EMIS experiences were reviewed

Three sets of questionnaires covering all relevant areas were designed to collect the necessary information from school principals, WEO statisticians, ZED statisticians and OEB EMIS staff and other process owners. In addition, two different lists of semi-structured questions were designed for interview with OEB EMIS staff and process owners, WEO and ZED heads. FGD was also held with PTA and school board representatives. Moreover, document analysis was made to substantiate information obtained through other instruments.

The questionnaires were pre-tested in representative samples. Two colleagues made comments on these tools. Based on the feedbacks, the instruments were revised for the final study. Then 142 copies were distributed to the respondents, out of which 128 (91.13%) were properly filled and returned. This return rate, as the researcher believed, could be satisfactory to make conclusions. The data obtained were analyzed using various statistical techniques: mean, percentages, standard deviation, t-test, chi-square, ANOVA and rank order correlation coefficient. The following were the major findings drawn from the analysis.

### **5.1.1. Characteristics of respondents**

- a) Though the educational qualification of the respondents were satisfactory (75 percent BA/BSC holders), they were less experienced (Only 47 percent had greater than two years of service), and the majority had no relevant field of study (more than 63 percent).
- b) Most of the school principals (78.13 percent), 50 percent of DED statisticians, 31.25 percent of ZED statisticians and planners, and 18.75 percent of OEB respondents had not received training related to EMIS activities. Sixty-six percent of those who had taken the training disclosed that the training was not satisfactory in shouldering the bulk of EMIS activities.

### **5.1.2. Practices and problems of EMIS Management.**

#### **5.1.2.1. EMIS Functions at Respective Educational hierarchies**

- a) A Considerable number of school principals showed that the share of schools in EMIS had been collecting data (4.02), filling data collection questionnaire (4.00), and reporting to the woredas (3.87).
- b) Functions such as data preparation and analysis (2.25), development of school indicators (2.13) and disseminating data/information to users (2.37) were rarely performed at schools.
- c) As regards EMIS functions at WEO and ZED; except receiving data from schools (GM=3.58) and compiling reports (GM=3.72); functions like preparing questionnaires (GM=2.09), data preparation and analysis (GM=2.13), development of indicators (GM=2.37), provision of training (GM =2.28), and data/ information dissemination (Gm=2.09) were less performed ones.
- d) All EMIS components were functional at OEB (mean greater than 3.5) at higher level except identification and analysis of needs (mean=2.44) and providing feedback (mean=2.44).

#### **5.1.2.2. The Design of Data Collection Questionnaire**

The design of the questionnaire was found to be poor. It was not designed so that it retains data/information disaggregated at an appropriate level (GM=2.15), has clear physical lay out (2.41), matches with school record keeping (2.34), and permit subsequent statistical analysis (2.39).

### **5.1.2.3. The availability of educational data are/ information at educational Levels**

- a) The study revealed that, qualitative data, per-student cost data/information, curriculum related data/information, disabled students data/information, and resource utilization data/information were rarely existed in EMIS. An organized student accomplishment and achievement data (mean=2.8), school age population (mean=3.06), and school facilities were available partly in the system.
- b) The most commonly available data at all levels were found to be wastage ratios, enrollment rates, promotion rates, student teacher, student-section student- textbook ratios.

#### **5.1.2.3.1. Formats by which data/information is available at different Levels**

Mostly, educational data/information were available in hard copies and handwritten documents at schools and woredas. Electronic documents are rarely used at schools and woredas, and sometimes used at zones and usually at region. Statistical yearbook were never reached schools, but mostly used at woredas and above.

#### **5.1.2.3.2. EMIS integration**

- a) More than 54.68 percent of each groups of respondents showed that the flow of data was only vertically up ward
- b) Data information was not integrated at schools, WEO, and ZED as per the response 70 percent of respondents.
- c) With respect to organized database, there found to be no organized database in school, WEO, and ZED ( 60 percent of each group of respond
- d) According to the majority of OEB respondents, however, their existed an organized data base in their organization.

#### **5.1.2.3.3. Demand for EMIS outputs**

- a) The study showed that, Parents and community(x=1.8), other government sectors (X=2.18), political decision makers (X=2.37), and students (x=1.34) had low-level demand for school level EMIS outputs. Teachers demand for EMIS was little more than low-level dema
- b) At WEO and ZED, other government sectors and political decision makers demand for EMIS outputs was low (less than 2.5 average mean).
- c) The demand for the EMIS outputs of Administrators and experts within the organization (2.82) and political decision makers at WEO, ZED, and OEB is average.

- d) They were researchers, EMIS workers within the organization, and NGOs whose demand was higher at all levels.
- e) At region the EMIS outputs demand by clients was found to be higher

#### **5.1.2.4. Utilization of data/information**

- a) As regards the utilization of EMIS out puts, OEB mostly utilizes it in planning, developing programs and project, allocating resources, and evaluating performances.
- b) The study also revealed that schools, DED, ZED use EMIS outputs usually in management of operations and reporting purposes and sometimes in evaluating performances. The EMIS outputs were utilized rarely in facilitating planning, the development of programs and projects, allocating resources and monitoring by schools, DED and ZED.
- c) A number of reasons have been identified for the lack of utilizations of EMIS outputs. Majority of the respondents identified low level of analysis of the presented data, low technical capacity of staff and users as serious; Forty percent of each group of respondents identified organizational culture and leadership and Perceived effect of data use as moderate problems.
- d) On the other hand lack of access to extract data was found to be, a moderate problem by region, a serious one by the other three groups of respondents, where as, Poor data quality was reported to be a serious problem at DED, ZED and region, where as schools looked at it moderate.

#### **5.1.2.5. Quality of Data/information**

The overwhelming majority of respondents indicated that data information accuracy (GM=2.44), completeness (GM=2.48), clarity (GM=2.31), and timeliness (GM=1.79) and presentation (GM=2.46) were at poor quality level. Whereas, the relevance (GM=3.06), the frequency (2.86), detailed ness, and currency (GM=2.75) of data/information were at average level quality.

#### **5.1.2.6. Organizational development and capacity building**

- a) Concerning the capacity building activities, assignment of qualified personnel (GM= 2.48), availability of material and financial resources (GM= 1.87), availability of remuneration packages (2.31), and the non-existence of checks and balances (2.24) were the less performed areas at all levels.

- b) Clear working relationships (GM= 2.95), the existence of ICT infrastructure (GM =2.83) and the existence of training (Gm= 2.87) were also areas found to have average application.
- c) Institutional building and capacity building activities were performed at a very low level at school levels. The situation was in an increasing success up the hierarchy.

**5.1.2.7. Factors affecting EMIS management**

- a) Difficulty to keep skilled technical staff, low technical capacity of EMIS workers, Problems related to data Preparation and analysis, poor ICT infrastructure and Information illiteracy (low knowledge on the part of users) were ranked 1-5 and have 3.5 mean score and above. Overall lack of technical mechanics on the part of users and suppliers were the major constraints of EMIS management
- b) Absence of clear policy, lack of information integration, poor design of data collection questionnaires and poor data quality were also found to be factors hindering the management of EMIS in the region

## 5.2. Conclusion

The review of EMIS functions at various decision-making levels of Oromia made it apparent that EMIS functions were not fully applied at schools and zones. The EMIS functions were limited to gathering at schools and summarizing at woredas and zones. The region's EMIS came nowhere near dealing with all aspects of education. The study also revealed that information was mainly confined to input indicators. Data/information on processes and outputs were found to be rare in the system. Outcome indicators were never touched. Besides, information available were limited to counts, meaning quantitative paradigm dominate approaches to EMIS as an expense of qualitative ones.

In addition, the EMIS outputs of the region lack quality in terms of accuracy, presentation and timeliness; hence it had the problem of reliability. Utilization of data /information as well was limited to few areas of interest like management of operations, reporting and evaluation at schools woredas and zones. The EMIS management of the region suffered primarily from major capacity constraints. Moreover, the study revealed that in EMIS unit there were no human and material resources in sufficient number and quality.

Therefore, in light of these findings it could be concluded that the practices of EMIS management in Oromia are not running well to provide the functions it intends to serve for the Education system of the region. The region has experienced fundamental problems associated with lack of congruence between data/information availability, information demand and utilization. Paradoxically, the region's education system is growing to a gigantic level; larger number of schools, teachers and students, whose management require strong information base. What is more, there are regional, national, and international commitments that require effective policymaking and system monitoring through data and information. Generally, the needs for information in Oromia are varied and becoming increasingly complex on the one hand and its EMIS management practices to meet the data/information needs of users becomes poor on the other hand. This has been a threat to the Management of the education system of Oromia, in achieving its regional, national, and international promises.

### 5.3. Recommendations

Based on the findings, the researcher recommended the following.

#### 1. Redesigning the EMIS

- a) EMIS managers at OEB in collaboration with other levels should develop demand driven EMI supply network. These are possible through: First, sound understanding of the information needs of all users. To realize this EMIS managers at all levels should primarily identify and analyze the information needs of clients that accounts diversity of management tasks and administrative levels through participatory dialogue. Managers should not develop a shopping list of data they need.  
  
Second, EMIS managers at the region and other suppliers at all levels of the system must retool the information system to allow information to be conveyed in ways that are easy to access, understand and use. These are possible through adapting level of analysis to particular users and designing clear lines of communication that are user-friendly.
- b) EMIS managers of the region must redesign EMIS to the concept that data would be analyzed, summarized, and used at each successive level of administrative pyramid. In order for EMIS to function properly, the three main functions which are data collection, data analysis and management, and data utilization should be applied at any educational level. To facilitate this, the design of EMIS by OEB must therefore, incorporate decisions as to which information must remain at each level and which must pass to another level. This could encourage schools, woredas, and zones not to limit themselves to only gathering and reporting than analyzing and using.
- c) The region's EMIS was found to be deficient in encompassing all aspects of education. Therefore, OEB together with schools and woredas should design a Comprehensive EMIS that provide access to data on inputs, processes, outputs, and out comes and to quantitative and qualitative data. The region should institute periodic but regular data collection system in EMIS on indicators that are permanent in nature and rarely analyzed. The criteria for deciding the time intervals these data should be reasonably collected are the life of the data

and the cost of collecting and analyzing. Based on the pace of change, national experts can examine the life of the data/information.

- d) The emphasis of the regions EMIS has found to be on quantitative aspects of educational developments. Since, quantitative aspects of the system provide a snapshot of what is happening, but rarely answer the question of why. Thus, the EMIS of the region together with all its constituencies should use FGD and interviews with a sample of schools, community, parents, students and teachers to get opinions, comments and other qualitative issues on reasons for a decrease in enrollment, curriculum, methodology, policy and on all system performances that could not be obtained through questionnaire.
- e) Data collection requires the use of some medium for collecting data. The type of data collection instrument will determine the type of data preparation required before data analysis. Thus, the researcher recommends that the data collection instrument should be clear in terms of the information they seek, retain data disaggregated at an appropriate level, designed to permit subsequent statistical analysis of data for reliability. The physical lay out and the sort of paper used should not reflect the desire to reduce costs. More over periodic evaluation should be made according to priority changes of the education system in the design and evaluation representatives from all user groups must be included.
- f) The first verification of data quality should take place at woredas and cluster resource centers; because they are the structure nearest to the school which knows the school best and asks for correction the soonest. It must be indispensable because all the errors detected after wards will be difficult to correct since access to them would be difficult.
- g) It was found that in the region under study, an integration of data was not made practical. But data integration is intended to add value to data that are already collected and available in variously scattered places with in the same system as a result data cannot readily be integrated or used integrative unless data integration strategy is implemented .Then OEB EMIS staff together with other EMIS levels should first standardize data structures, types, formats, and coding schemes as well as creating institutional agreements to share and mine data. Hence, longitudinal and cross-sectional analysis and comparison, and the Sharing of information become the reality.

- h) OEB EMIS staff should set clear information policy to set up, operate and manage EMIS. Besides, a manual of operation has to be prepared that spell out essential information about data collection, and schedule of activities.

## **2. Raising the demand for and the utilization of data/ information**

A supply of data, no matter how good the data/information would be, is insufficient with out a clearly defined demand. Thus, OEB, and other subsequent EMIS levels (Schools, WEO, and ZED) must create demand on the part of users and the change the demand into utilization by:

- a) Making stakeholders aware of the utility of data and information to help them achieve their objectives and establishing opportunities for stakeholders to use information. The creation of such awareness is possible through conferences, workshops and media and through the promotion accountability procedures.
- b) Ensuring the quality of data/information by instituting verification centers at all levels.
- c) Linking EMIS to the articulated data needs of specific users and the work of specific units.
- d) There is little point in having a demand for information unless it is used in the decision process. Our assessment of data use clearly showed that data/information has not been used to their fullest potential at WEO, ZED, and schools. There is a need to change the demand into utilization through institutional development and capacity building activities. These are possible through: First, the use and presentation of data/information should be adapted to every decision making level. If not so, it will end with accumulation of information with out application. Second, design different and sufficient dissemination strategies that are friendly to users. For example: yearbooks, booklets, posters, bulletins, newsletters, and soft copies where necessary and possible at all levels of the system.

## **3. Building the capacity of EMIS staff and users.**

The task of collecting, processing and interpreting and communicating educational data information to users is a difficult one. Thus,

- a) The training and qualification of personnel in charge of EMIS have to be made on the same scale as the tasks to be accomplished and trained staff to relay on. Senior education

managers of OEB should be convinced of the qualification requirements for all the people working for EMIS at all levels. The business Process Re-engineering scheme for EMIS has to be fully implemented up to school levels with a modification of requirements concerning field of specialization. Field of specialization should not be 'any diploma' or 'any degree' but a field related to educational management, statistics, computer science, sociology, and IT. Schools, WEO, and ZED must pay great attention to the requirements while assigning the required personnel for the post.

- b) The personnel at EMIS section at all levels have to be trained and re-trained in such domains as data collection, verification, preparation and analysis, dissemination, and utilization; the right experts must be made to train them.
- c) Weak information architecture is another constraint that hampers the EIS management. The development of information system, therefore, requires new attention to paths and patterns of ICT. Thus, new capacities like computers need to be introduced for easy and direct access at least at woredas OEB, ZED, and WEO should find funding organizations that sponsor the provision of the hard copies. Soft copies as well need to be developed to greatly facilitate operators in schools, woredas, and zones; to process, report, and disseminate the data/information. The overall responsibility of facilitating EMIS should lie on the respective organization heads.
- d) Incentive packages for those involved in EMIS activities should be instituted from schools up the region. OEB in this regard should search for donor agencies that are willing to subsidize the EMIS system. .

**4. OEB EMIS staff in collaboration with WEO and ZED statisticians should develop "EMIS development project proposal" that could help them to seek budget from donor agencies for the implementation of the three major recommendations forwarded above.**

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**Appendix-A**  
**Addis Ababa University**  
**College of Education**  
**Department of educational Planning and**  
**Management**

**Questionnaire to be filled by school principals.**

**General direction**

I would like to express my heart-felt appreciation and regard for your time, in advance, to fill this questionnaire. This questionnaire is designed to collect data for a research thesis entitled, “practices and problems of managing EMIS in Oromia.”

The purpose is to gather information on the practices and the management of EMIS and major challenges encountered. The information obtained may help to recommend plausible intervention measures that may contribute to improve the effectiveness of EMIS functions in the region.

The success of the study will depend on the quality and timely responses. Your response will be kept confidential and used only for academic purposes.

- No need of writing your name;
- Please put ‘x’ or ‘□’ mark in the box provided where alternatives are given
- If you have additional or different opinion from the given alternatives please write it on the space provided for the option “if other, please specify”,
- You are kindly requested to give short answers in the space provided.;
- Your urgent responses will contribute to the value of the research.

**NB.** The Acronyms and terms used in the questionnaire stand for

AEC- Annual Education census

EMIS-education

management

information

system

## Part I- General Information

1. Zone \_\_\_\_\_ Woreda \_\_\_\_\_ School \_\_\_\_\_

2. Sex

a. Male  b. Female

3. Age a. 25 and less

b. 26-35

c. 36-45

d. Above 45

4. School level

a. Grades 1-4

e. Grades 9-12

b. Grades 5-8

f. Grade 1-12

c. Grades 1-8  if other, please specify \_\_\_\_\_

d. Grades 9-10

5. Work responsibility

a. Record officer

b. School principal

If other, please specify \_\_\_\_\_

6. Educational qualification

a. Secondary school Graduate

b. .TTI certificate

C.TVET/college Diploma

d. BA/BSC

e. MA/MSC

If other, please specify \_\_\_\_\_

7. Subject of specialization:

Major \_\_\_\_\_

Minor \_\_\_\_\_

8. Job experience:

In current position \_\_\_\_\_

Years of service in other position \_\_\_\_\_

Total years of service \_\_\_\_\_

9. Have you taken any training related to your current position?

a. Yes  b. No

10. If your answer to question number '9' is yes, the training is:

a. satisfactory  b. unsatisfactory

11. Would you list down areas in which you have taken trainings?

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## Part II- EMIS Management

### The design of Data collection questionnaire

1. The following are requirements related to data collection questionnaire. Indicate the degree of your agreement or disagreement by the numbers:

**5= strongly agree, 4=agree, 3= medium, 2= disagree, 1= strongly disagree.**

No	requirements	5	4	3	2	1
1.1	Retain data disaggregated at an appropriate level					
1.2	Common definitions and terminologies are used					
1.3	Provided choices are mutually exclusive					
1.4	The form has clear physical lay out					
1.5	The design matches with school record keeping					
1.6	Permit subsequent statistical analysis of data for reliability and validity					

2. If you have any comment on the data collection questionnaire, please specify

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**EMIS functions at various education levels.**

3. The following are functions in the production of education information. Which ones are performed in your school? Please rate them to indicate:

**5=very high, 4=high, 3= average 2= low, 1=very low**

No.	Preparing school specific data collection format	4	3	2	1	0
3.1	Collecting data					
3.2	Storing data/ information					
3.3	Filling annual data collection questionnaire					
3.4	Reporting to districts					
3.5	Developing school level indicators					
3.6	Preparing and analyzing data					
3.7	Verifying data					
3.8	Disseminating to users					
3.9	Preparing school specific data collection format					
3.10	Collecting data					
3.11	Storing data/ information					
3.12	Filling annual data collection questionnaire					
3.13	Reporting to woredas					
3.14	Developing school level indicators					
3.15	If others please specify					

?

### Availability of educational data/information

4. Listed below are data and information. Which ones are available in your school? Please rate the extent by using the numbers to indicate:

**5=Fully available, 4=Mostly available, 3=partially available, 2=rarely available, 1=not available**

No.	Data /information	5	4	3	2	1
4.1	School age population					
4.2	Enrollment rates by grade, age, sex					
4.3	student teacher/student section/student text book ratios					
4.4	Curriculum related data/information					
4.5	Disabled students					
4.6	Organized students achievement and accomplishment					
4.7	Promotion/graduation/Transition rates					
4.8	Wastage ratios					
4.9	Per-students cost					
4.10	School facilities					
4.11	Resource utilization					
4.12	Qualitative data					

### Formats in which education data/information are available.

5. Listed below are formats in which education information are available. Show the extent of in which the data/information exist in a given format in your organization

**5= Always, 4= usually, 3= sometimes, 2= rarely, 1= never**

No	formats	5	4	3	2	1
5.1	Statistical year book					
5.2	Electronic document					
5.3	Printed document					
5.4	Hand written documents					

## Quality of EMIS data/information

6. To what extent do data/information in your school satisfy the following quality criteria? Please rate them using the numbers indicated:

5= Very high, 4= high, 3= average, 2= low, 1=very low

Indicators of Quality		5	4	3	2	1
major	minor					
Content	Accuracy					
	Relevance					
	Completeness					
Form	Clarity					
	Detailed ness					
	Presentation					
timeliness	Timeliness					
	Currency					
	frequency					

## Demand for EMIS outputs

7. What is the extent of demand for EMIS outputs in your school? Indicate the degree of your clients demand by the numbers:

5= Very high, 4= high, 3= average 2= low, 1= very low

No.	clients	5	4	3	2	1
7.1	School administrators					
7.2	Teachers					
7.3	students					
7.4	Parents and the community					
7.5	Other government sectors					
7.6	Researchers					
7.7	Political decision makers					
7.8	NGOs					

if you have any comments on the demand for information, please,specify\_\_\_\_\_

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### Utilization of EMIS outputs

8. To what extent do the EMIS out puts are used for the following functions?

Indicate the extent by the numbers:

**5= very high, 4= high, 3= medium, , 2= low, 1= very low.**

<b>No</b>	<b>Functions</b>	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
9.1	Facilitates educational planning					
9.2	Management of education operations					
9.3	Monitor progress towards objectives					
9.4	Evaluate performance					
9.5	Reporting to authorities and other concerned bodies					
9.6	Developing programs and projects					
9.7	Allocating resources					
	If others, please specify					

if you have any comments on the utilization of information, please specify\_\_\_\_\_

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### Barriers to the use of EMIS data/information

9. Listed below are assumed barriers to the use for information for decision-making? Please rate them using the numbers; 5=very serious, 4=serious,3=moderate ,2=less serious, and 1=not a problem.

No	Proposed Reasons	5	4	3	2	1
11.1	Low level of data analysis					
11.2	Poor quality of data					
11.3	Lack of motivation to use					
11.4	Lack of capacity to extract data					
11.5	Perceived effect of data use					
11.6	Organizational culture and leadership					
11.7	Low technical capacity of users and EMIS staff					
	If others please specify					

10. if you have any comments on the barriers to the utilization of information, please specify \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

### Data/information integration

13. Is there an organized data base which indicates all the yearly activities of each unit in your school?

a. Yes  b. No

14. Do you think that integration of EMIS in one single system is made Practical in your school?

a. Yes  b. No

15. In which direction data/information flows in your school?

1. Vertically       4. 1 and 2   
 2. Horizontally       5. 1, 2 and 3   
 3. Diagonally

### Part III - Organization Development and Capacity Building

1. Listed below are activities related to organizational development and capacity building.

Show your agreement or disagreement by the numbers to indicate:

**5= strongly agree, 4= agree, 3=undecided, 2= disagree, 1= strongly disagree**

No	Activities	5	4	3	2	1
1.1	Systems, procedures and structures are in place					
1.2	Institutional reforms are made					
1.3	Qualified personnel are assigned in EMIS positions					
1.4	Job descriptions are made clear					
1.5	Clear working relationship exists					
1.6	Relevant trainings are provided					
1.7	Check and balance points exist					
1.8	Material and financial resources are available					
1.9	ICT infrastructures are in place					
1.10	Remuneration packages are available					

2. If you have any comment on information system unit /section, please specify

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#### Part IV - Factors Affecting EMIS Management

1. Listed below are factors affecting EMIS management .Indicate the extent of seriousness as they occur in your school by the numbers: **5=very serious, 4=serious, 3=moderate, 2=less serious, 1=not a problem**

No	problems	5	4	3	2	1
1.1	Absence of clear data/information policy					
1.2	Poor design of data collection questionnaire					
1.3	Low technical capacity of EMIS staff					
1.4	Difficulty to keep skilled technical staff					
1.5	Poor ICT infrastructure					
1.6	Lack of incentives for those involved in EMIS activities					
1.7	problems related to data Preparation and analysis					
1.8	Problems related to software					
1.9	Lack of data/information integration					
1.10	Poor data quality					
1.11	Poor information culture on the part of users					
1.12	Delayed submission of reports					
1.13	If others please specify					
1.14						

#### Part V General Comments

If you have any general comment, on EMIS management in your school please specify.

- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_
- d. \_\_\_\_\_



## Part I- General Information

1. Zone \_\_\_\_\_ Woreda \_\_\_\_\_
2. Sex
  - a. Male
  - b. Female
3. Age
  - a. 25 and less
  - b. 26-35
  - c. 36-45
  - d. Above 45
4. Work responsibility
  - a. statistician
  - b. plannerIf other, please specify \_\_\_\_\_
5. Educational qualification
  - a. Secondary school Graduate
  - b. .TTI certificate
  - C.TVET/college Diploma
  - d. BA/BSC
  - e. MA/MSCIf other, please specify \_\_\_\_\_
6. Subject of specialization:  
Major \_\_\_\_\_  
Minor \_\_\_\_\_
7. Job experience:  
In current position \_\_\_\_\_  
Years of service in other position \_\_\_\_\_  
Total years of service \_\_\_\_\_
8. Have you taken any training related to your current position?
  - a. Yes
  - b. No
9. If your answer to question number '8' is yes, the training is:
  - a. satisfactory
  - b. unsatisfactory

10. Would you List down the training areas. \_\_\_\_\_

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## Part II- EMIS Management

### The design of Data collection questionnaire

2. The following are requirements related to data collection questionnaire. Indicate the degree of your agreement or disagreement by the numbers:

**5= strongly agree, 4=agree, 3= medium, 2= disagree, 1= strongly disagree.**

No	requirements	5	4	3	2	1
1.1	Retain data disaggregated at an appropriate level					
1.2	Common definitions and terminologies are used					
1.3	Provided choices are mutually exclusive					
1.4	The form has clear physical lay out					
1.5	The design matches with school record keeping					
1.6	Permit subsequent statistical analysis of data for reliability and validity					

2. If you have any comment on the data collection questionnaire, please specify

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3. The following are functions in the production of education information. Which ones are performed in your organization? Please rate them to indicate:

**5=very high, 4=high, 3= average 2= low, 1=very low**

		5	4	3	2	1
3.1	Identification and analysis of information needs					
3.2	Preparing data collection formats					
3.3	Receiving data from immediate lower level					
3.4	Verification of data					
3.5	Compiling reports					
3.6	Preparing and analyzing					
3.7	Developing indicators					
3.8	Preparation of abstracts					
3.9	Providing EMIS related trainings					

#### **Availability of educational data/information**

4. Listed below are data and information. Which ones are available in your organization?

Please rate the extent by using the numbers to indicate:

**5=Fully available, 4=Mostly available, 3=partially available, 2=rarely available, 1=not available**

No.	Data /information	5	4	3	2	1
4.1	School age population					
4.2	Enrollment rates by grade, age, sex					
4.3	student teacher/student section/student text book ratios					
4.4	Curriculum related data/information					
4.5	Disabled students					
4.6	Organized students achievement and accomplishment					
4.7	Promotion/graduation/Transition rates					
4.8	Wastage ratios					
4.9	Per-students cost					
4.10	School facilities					
4.11	Resource utilization					
4.12	Qualitative data					

If you have any comment on the availability of data/information, please specify

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### Formats in which education data/information are available

5. Listed below are formats in which education information are available. Show the extent of in which the data/information exist in a given format in your organization.

5= Always, 4= usually, 3= sometimes, 2= rarely, 1= never

No	formats	5	4	3	2	1
5.1	Statistical year book					
5.2	Electronic document					
5.3	Printed document					
5.4	Hand written documents					

### Quality of EMIS data/information

6. To what extent do data/information in your organization satisfy the following quality criteria?

Please rate them using the numbers indicated:

5= Very high, 4= high, 3= average, 2= low, 1=very low

Indicators of Quality		5	4	3	2	1
<b>major</b>	<b>minor</b>					
Content	Accuracy					
	Relevance					
	Completeness					
Form	Clarity					
	Detailed ness					
	Presentation					
timeliness	Timeliness					
	Currency					
	frequency					

## Demand for EMIS outputs

7. What is the extent of demand for EMIS outputs in your organization? Indicate the degree of your clients demand by the numbers:

**5= Very high, 4= high, 3= average 2= low, 1= very low**

No.	clients	5	4	3	2	1
7.1	EMIS workers with in the organization					
7.2	Administrators and experts within the organization					
7.3	Other government sectors					
7.4	Political decision makers					
7.5	Researchers					
7.6	NGOs					

8. If you have any comments on the demand for information, please,specify\_\_\_\_\_

## Utilization of EMIS outputs

9. To what extent do the EMIS out puts are used for the following functions?

Indicate the extent by the numbers:

**5= very high, 4= high, 3= medium, ,2= low, 1= very low.**

N <sub>o</sub>	Functions	5	4	3	2	1
9.1	Facilitates educational planning					
9.2	Management of education operations					
9.3	Monitor progress towards objectives					
9.4	Evaluating performance					
9.5	Report to authorities and other stakeholders					
9.6	Developing programs and projects					
9.7	Allocating resources					
	If others, please specify					

10. If you have any comments on the utilization of information, please specify \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Barriers to the use of EMIS data/information**

11. Listed below are assumed barriers to the use for information for decision-making? Please rate them as they occur in your organization using the numbers; 5=very serious, 4=serious,3= moderate ,2=less serious, and 1=not a problem.

No	Proposed Reasons	5	4	3	2	1
11.1	Low level of data analysis					
11.2	Poor quality of data					
11.3	Lack of motivation to use					
11.4	Lack of capacity to extract data					
11.5	Perceived effect of data use					
11.6	Organizational culture and leadership					
11.7	Low technical capacity of users and EMIS staff					
	If otheras please specify					

11. if you have any comments on the barriers to the utilization of information,pleasespecify\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Data/information integration**

13. Is there an organized database in yor organization?

a. Yes  b. No

14. Do you think that integration of EMIS in one single system is made Practical in your organization?

a. Yes

b. No

15. In which direction data/information flows in your organization?

1. Vertically

4. 1 and 2

2. Horizontally

5. 1, 2 and 3

3. Diagonally

### Part III - Organization Development And Capacity Building

2. Listed below are activities related to organizational development and capacity building.

Show your agreement or disagreement by the numbers to indicate:

**5= strongly agree, 4= agree, 3=undecided, 2= disagree, 1= strongly disagree**

No	Activities	5	4	3	2	1
1.1	Systems, procedures and structures are in place					
1.2	Institutional reforms are made					
1.3	Qualified personnel are assigned in EMIS positions					
1.4	Job descriptions are made clear					
1.5	Clear working relationship exists					
1.6	Relevant trainings are provided					
1.7	Check and balance points exist					
1.8	Material and financial resources are available					
1.9	ICT infrastructures are in place					
1.10	Remuneration packages are available					

2. If you have any comment on information system unit /section, please specify

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#### Part IV - Factors Affecting EMIS Management

1. Listed below are factors affecting EMIS management .Indicate the extent of seriousness as they occur in your organization by the numbers: **5=very serious, 4=serious, 3=moderate, 2=less serious, 1=not a problem**

No	problems	5	4	3	2	1
1.1	Absence of clear data/information policy					
1.2	Poor design of data collection questionnaire					
1.3	Low technical capacity of EMIS staff					
1.4	Difficulty to keep skilled technical staff					
1.5	Poor ICT infrastructure					
1.6	Lack of incentives for those involved in EMIS activities					
1.7	problems related to data Preparation and analysis					
1.8	Problems related to software					
1.9	Lack of data/information integration					
1.10	Poor data quality					
1.11	Poor information culture on the part of users					
1.12	Delayed submission of reports					
1.13	If others please specify					
1.14						

#### Part V General Comments

If you have any general comment, on EMIS management in your school please specify.

- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_
- d. \_\_\_\_\_

**Appendix -C**  
**Addis Ababa University**  
**College of Education**  
**Department of educational Planning and**  
**Management**

**Questionnaire to be filled by OEB**

**General direction**

I would like to express my heart-felt appreciation and regard for your time, in advance, to fill this questionnaire. This questionnaire is designed to collect data for a research thesis entitled, “practices and problems of managing EMIS in Oromia.”

The purpose is to gather information on the practices and the management of EMIS and major challenges encountered. The information obtained may help to recommend plausible intervention measures that may contribute to improve the effectiveness of EMIS functions in the region.

The success of the study will depend on the quality and timely responses. Your response will be kept confidential and used only for academic purposes.

- No need of writing your name;
- Please put ‘x’ or ‘□’ mark in the box provided where alternatives are given
- If you have additional or different opinion from the given alternatives please write it on the space provided for the option “if other, please specify”,
- You are kindly requested to give short answers in the space provided.;
- Your urgent responses will contribute to the value of the research.

**NB.** The Acronyms and terms used in the questionnaire stand for

AEC- Annual Education census

EMIS-education

management

information

system

## Part I- General Information

1. Sex a. male  b. female

2. Age a. 25 and less

b. 26-35

c. 36-45

d. Above 45

3. Work responsibility

a. EMIS case worker

b. EMIS process owner

If other, please specify \_\_\_\_\_

4. Educational qualification

a. Secondary school Graduate

b. TTI certificate

c. TVET/college Diploma

d. BA/BSC

e. MA/MSc

If other, please specify \_\_\_\_\_

5. Subject of specialization:

Major \_\_\_\_\_

Minor \_\_\_\_\_

6. Job experience:

In current position \_\_\_\_\_

Years of service in other position \_\_\_\_\_

Total years of service \_\_\_\_\_

7. Have you taken any training related to your current position?

a. Yes

b. No

8. If your answer to question number '7' is yes, the training is:

c. satisfactory

b. unsatisfactory

9. Would you list down the training areas?

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## PART II-EMIS Management

### The design of Data collection questionnaire

1. The following are requirements related to data collection questionnaire.

Indicate the degree of your agreement or disagreement by the numbers:

**5= strongly agree, 4=agree, 3= medium, 2= disagree, 1= strongly disagree.**

No	requirements	5	4	3	2	1
1.1	Retain data disaggregated at an appropriate level					
1.2	Common definitions and terminologies are used					
1.3	Provided choices are mutually exclusive					
1.4	The form has clear physical lay out					
1.5	The design matches with school record keeping					
1.6	Permit subsequent statistical analysis of data for reliability and validity					

2. If you have any comment on the data collection questionnaire, please specify

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### **EMIS functions at various education levels.**

3. The following are functions in the production of education information. Which ones are performed in your organization? Please rate them to indicate:

**5=very high, 4=high, 3= average 2= low, 1=very low**

no	Functions	5	4	3	2	1
3.1	Needs analysis Identification and analysis of information needs					
3.2	Preparing and distributing data collection questionnaire and format					
3.3	Receiving reported data from zones					
3.4	Encoding and clearing data					
3.5	Processing and analyzing data					
3.6	Interpreting data					
3.7	Storing data /information					
3.8	Developing indicators					
3.9	Publishing abstract					
3.10	Disseminating EMIS outputs					
3.11	Providing EMIS related training					

### Availability of educational data/information

4. Listed below are data and information. Which ones are available in your organizational?

Please rate the extent by using the numbers to indicate:

**5=Fully available, 4=Mostly available, 3=partially available, 2=rarely available, 1=not available**

No.	Data /information	5	4	3	2	1
4.1	School age population					
4.2	Enrollment rates by grade, age, sex					
4.3	student teacher/student section/student text book ratios					
4.4	Curriculum related data/information					
4.5	Disabled students					
4.6	Organized students achievement and accomplishment					
4.7	Promotion/graduation/Transition rates					
4.8	Wastage ratios					
4.9	Per-students cost					
4.10	School facilities					
4.11	Resource utilization					
4.12	Qualitative data					

### Formats in which education data/information are available.

5. Listed below are formats in which education information are available. Show the extent of in which the data/information exist in a given format in your organization

**5= Always, 4= usually, 3= sometimes, 2= rarely, 1= never**

No	formats	5	4	3	2	1
5.1	Statistical year book					
5.2	Electronic document					
5.3	Printed document					
5.4	Hand written documents					

## Quality of EMIS data/information

6. To what extent do data/information in your organization satisfy the following quality criteria?

Please rate them using the numbers indicated:

**5= Very high, 4= high, 3= average, 2= low, 1=very low**

Indicators of Quality		5	4	3	2	1
<b>major</b>	<b>minor</b>					
Content	Accuracy					
	Relevance					
	Completeness					
Form	Clarity					
	Detailed ness					
	Presentation					
timeliness	Timeliness					
	Currency					
	frequency					

## Demand for EMIS outputs

7. What is the extent of demand for EMIS outputs in your organization? Indicate the degree of your clients demand by the numbers:

**5= Very high, 4= high, 3= average 2= low, 1= very low**

No.	clients	5	4	3	2	1
7.1	EMIS workers with in the organization					
7.2	Administrators and experts within the organization					
7.3	Other government sectors					
7.4	Political decision makers					
7.5	Researchers					
7.6	NGOs					

8. if you have any comments on the demand for information, please,specify\_\_\_\_\_

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### Utilization of EMIS outputs

3. To what extent do the EMIS out puts are used for the following functions? Indicate the extent by the numbers:

**5= very high, 4= high, 3= medium, , 2= low, 1= very low.**

No	Functions	5	4	3	2	1
9.1	Facilitates educational planning					
9.2	Management of education operations					
9.3	Monitor progress towards objectives					
9.4	Evaluate performance					
9.5	Report to authorities					
9.6	Developing programs and projects					
9.7	Allocating resources					
	If others, please specify					

4. if you have any comments on the utilization of information, please specify\_\_\_\_\_

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## Barriers to the use of EMIS data/information

5. Listed below are assumed barriers to the use of information for decision-making? Please rate them using the numbers; 5=very serious, 4=serious,3= moderate ,2=less serious, and 1=not a problem.

No	Proposed Reasons	5	4	3	2	1
11.1	Low level of data analysis					
11.2	Poor quality of data					
11.3	Lack of motivation to use					
11.4	Lack of capacity to extract data					
11.5	Perceived effect of data use					
11.6	Organizational culture and leadership					
11.7	Low technical capacity of users and EMIS staff					
	If others please specify					

6. if you have any comments on the barriers to the utilization of information, please specify \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

## Data/information integration

13. Is there an organized data base in your organization?

a. Yes  b. No

14. Do you think that integration of EMIS in one single system is made practical in your organization?

a. Yes  b. No

15. In which direction data/information flows in your school?

1. Vertically  4. 1 and 2   
 2. Horizontally  5. 1, 2 and 3   
 3. Diagonally

### Part III - Organization Development and Capacity Building

1. Listed below are activities related to organizational development and capacity building. Show your agreement or disagreement by the numbers to indicate:

**5= strongly agree, 4= agree, 3=undecided, 2= disagree, 1= strongly disagree**

No	Activities	5	4	3	2	1
1.1	Systems, procedures and structures are in place					
1.2	Institutional reforms are made					
1.3	Qualified personnel are assigned in EMIS positions					
1.4	Job descriptions are made clear					
1.5	Clear working relationship exists					
1.6	Relevant trainings are provided					
1.7	Check and balance points exist					
1.8	Material and financial resources are available					
1.9	ICT infrastructures are in place					
1.10	Remuneration packages are available					

2. If you have any comment on information system unit /section, please specify

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#### Part IV - Factors Affecting EMIS Management

1. Listed below are factors affecting EMIS management .Indicate the extent of seriousness as they occur in your organization by the numbers: **5=very serious, 4=serious, 3=moderate, 2=less serious, 1=not a problem**

No	problems	5	4	3	2	1
1.1	Absence of clear data/information policy					
1.2	Poor design of data collection questionnaire					
1.3	Low technical capacity of EMIS staff					
1.4	Difficulty to keep skilled technical staff					
1.5	Poor ICT infrastructure					
1.6	Lack of incentives for those involved in EMIS activities					
1.7	problems related to data Preparation and analysis					
1.8	Problems related to software					
1.9	Lack of data/information integration					
1.10	Poor data quality					
1.11	Poor information culture on the part of users					
1.12	Delayed submission of reports					
1.13	If others please specify					
1.14						

#### Part V General Comments

If you have any general comment, on EMIS management in your school please specify.

- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_
- d. \_\_\_\_\_

## Appendix-D

### Interview Items for OEB EMIS Process Owner, Zone EMIS Statistician, and WEO Statistician

1. Is the EMIS out puts of your region demand or supply driven?
2. If it is demand driven, how do you identity the information needs of users?
3. Is it believed that the information collected suffices the need of all information seekers in the region?
4. How helpful is the EMIS organizational structure and personnel assignment to accomplish EMIS activities effectively? Specifically regarding:
  - ❖ EMIS structure
  - ❖ Personnel assignment
  - ❖ Job description
5. What capacity building mechanisms are in place to assist EMIS personnel?
6. What kinds of concrete activities have been implemented in order to improve the situation of information dissemination and utilization? Specifically, Formats of dissemination
7. What ICT infrastructures are used to facilitate EMIS activities?
8. How reliable is the EMIS out puts, in terms of accuracy, relevance, completeness, and timeliness?
9. What are the major problems encountered in the management of EIS, specifically with regards to:
  - ❖ Data collection and analysis
  - ❖ Dissemination and Utilization
10. How do you attempt to resolve the problems in order to improve the situation?

## Appendix- E

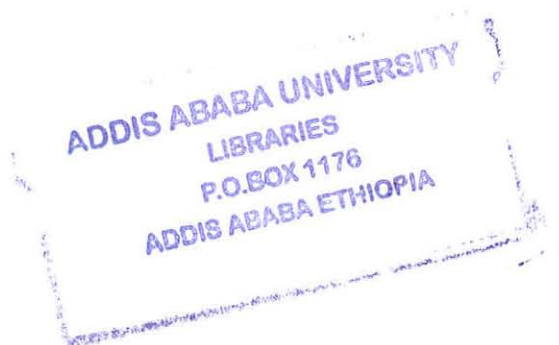
### Interview Items for School Principals/ Record Officers

1. How concerned is the school in filling the educational statistics format? Do you think that the data is reliable?
2. Are the questionnaires reach your school at an appropriate time and returned in the very time the educational office wants it?
3. What are the efforts the school is making in handling and use of data/ information?
4. Is it believed that the EMIS out puts of your school satisfies the needs of users?
5. What do you think are the roles to be played by REB, ZED, and WEO, in relation to EMIS management?
6. How helpful is the organization of EMIS in helping educational decision makings?
7. What are the major problems encountered in the management of EIS, specifically with regards to:
  - a. Data collection and analysis
  - b. Dissemination
  - c. Utilization
8. How do you attempt to resolve the problems in order to improve the situation?

## Appendix-F

### Focus Group Discussion Guide

1. How concerned is the school in filling the educational statistics format?
2. What EMIS functions are performed in your school?
3. What data/information are available in your school? Do you think that it satisfies the needs of users?
4. Do you think that the data is reliable in terms of accuracy, relevance, completeness, and timeliness?
5. What are the major problems encountered in the management of EIS, specifically with regards to:
  - a. Data collection and analysis
  - b. Dissemination
  - c. Utilization



## Appendix G

### Geographic stratification of Oromia National Regional state

	Category/ strata	List of Zones in the Category	Sampled Zone
1	South East Oromia	Borena, Guji, Bale, Arsi, East Arsi	Guji, Arsi
2	East Oromia	East Hararghe, West Hararghe	West Hararghe
3	West Oromia	East Wollega, Horo Guduru Wollega, Gimbi, Dembidolo, Jimma, ilubabor	East Wollega, Jimma
4	Central Oromia	North showa, East showa, West showa, south west showa	North showa
5	City administration	Assella, Burayou, Bishoftu, Shashemenne, Jima, Nekemte	Assella, Nekemte

## Appendix H

### Sample zones, Districts, and schools

Sampled zones	No. of Districts in the sampled zones	Sampled districts	No. of schools in the sampled district	Sampled schools	Level	Total No. of students		
Arsi( East)	25	Robe	49	Robe primary No 2	1-8	2655		
				Sibe	1-8	1001		
				Sadika	1-4	125		
				Hulul	1-8	251		
		Bale	20			Bale Primary	1-8	1851
						Bale Secondary	9-10	2099
						Ingoye Goya	1-8	312
						Mazaza	1-8	615
		Seru	29			Seru primary	1-8	1993
						Badi Medersho	1-8	356
						Dharo	1-4	186
						Wabe	1-4	267
Guji	13	Adola	35	Adama Dibe	1-8	1158		
				Sodu Dande	1-8	139		
				Adola Secondary	9-12	2544		
				Michicha	1-8	739		
		Liban	52			Balambal	1-8	1285
						Boba	1-8	617
						Ganale	1-8	1033
						Karsa Male	1-8	293
Nekemte city	-	-	25	Bikiltu Laka	1-8	2138		
				Fayinera	1-4	284		
				Kiba Wacha	1-8	898		
				Dire Jeto	1-8	1031		
				Kidanemiheret	1-8	862		
				Bake Jama	1-8	1678		
Assella City	-	-	22	Assella Andinet	1-8	2109		
				Assella Primary	1-8	989		
				Chilalo	9-12	4295		
				Mana sirressa	1-8	294		
				Degef	1-8	298		
				Engida	1-8	506		
Jima	18	Shabe sombo	27	Bake Kobo	1-8	1543		
				Dubo	1-4	762		
				Shabe	1-8	2777		
				Wala Kola	1-4	550		
						Bilu Harasu	1-8	837

		Dedo	71	Dedo Primary	1-8	2649
				Sapo Primary	1-4	625
				Dedp secondary	9-10	150
		Geera	35	Bara Gogo	1-4	665
				Gera	1-8	2019
				Kola Bada	1-4	515
				Yukiro	1-8	1375
North Shoa	18	Sululta	65	Sululta	1-8	1569
				Dirre	1-8	852
				Gulalle	1-4	317
				Mugar	1-8	747
		Fiche	11	Abiyot Fire	1-8	2238
				Bowwa	1-4	338
				Abdissa Aga	1-8	2068
		Mantara	1-4	367		
West Hararghe	15	Ancher	28	Badeyi	1-8	1478
				Dindin	1-8	1331
				Ancher Secondary	9-10	921
				Wadessa	1-8	466
		Doba	44	Doba	1-8	3216
				Hadas	1-8	1680
				laga lencha	1-4	647
				Tibro	1-8	740
		Hawwi Gudina	26	Daro Abona	1-8	517
				Daro Guddo	1-4	976
				Rimeti	1-4	373
				Wachu	1-4	308
East Wollega	16	Jima Arjo	36	Wayu Worke	1-8	1180
				Lugama	1-4	156
				Chafe Arjo	1-8	733
				Andinet	1-8	1126
		Bonaya Boshe	21	Boshe	1-8	1337
				Hidi Gurre	1-8	1069
				Jawwis	1-8	630
				Sodu Micha'el	1-8	426

Source: for the number of students and schools ( OEB, 2009).

## Appendix I

### List of Interview and FGD Samples

Interview			FGD
Zone	District	School	School
Arsi	Robe	Robe No 2	Sibe
North showa	Fiche	Mantara	Abiyot Fire
East Wollega	Bonaya Boshe	Sodu michael	Hiddi Gure

## DECLARATION

I, the undersigned, declare that this thesis is my work and that all sources of material used for the thesis have been fully acknowledged.

Name MEKONNEN KEJELA

Signature 

Place and date of submission AAU, 2/7/2010