

**PROBLEMS AND PROSPECTS OF EMI  
SUPPLY AND DEMAND IN TIGRAY  
REGION**

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## Acronyms and Abbreviations

<b>AEC</b>	Annual Education Census
<b>DEO</b>	District Education Office
<b>EFA</b>	Education for All
<b>EMI</b>	Education Management Information
<b>EMIS</b>	Education Management Information System
<b>ESDP</b>	Education Sector Development Program
<b>MDG</b>	Millennium Development Goal
<b>MoE</b>	Ministry of Education
<b>NGO</b>	Non Governmental Organization
<b>PTA</b>	Parent-Teacher Association
<b>REST</b>	Relief and Rehabilitation Society of Tigray
<b>TEB</b>	Tigray Education Bureau
<b>TFEDB</b>	Tigray Finance and Economic Development Bureau
<b>THB</b>	Tigray Health Bureau
<b>TGE</b>	Transitional Government of Ethiopia
<b>UNESCO</b>	United Education, Social and Cultural Organization
<b>UPE</b>	Universal Primary Education
<b>WEO</b>	Woreda Education Office
<b>WFEDO</b>	Woreda Finance and Economic Development Office
<b>ZED</b>	Zone Education Department

# CHAPTER ONE

## 1. Introduction

### 1.1 Background

The education management information system (EMIS) is a sub-system of an education system whose aim is to collect, process, analyzes and disseminates information. In addition to this EMIS is an institutional service unit producing, managing, and disseminating educational data/information, usually within a national Ministry or Department of Education (Carrizo and others 2003).

EMIS is an institutional service unit that aimed to collect data from schools, process the collected data by using computer software, and analyze the data based on the information need of different users. It also distributes the EMIS outputs by using different dissemination mechanisms including paper or electronically based services to satisfy the information need of different users.

Educational information gives a concrete picture of the educational condition at a given time, shows the relationship between aspects of the educational situation, and brings to light any anomalous condition requiring special attention, traces the line of educational development with changes that have taken place, suggest probable directions and enrollment rates in the future and enables the measurement of plan and policy realization in precise terms (Psacharopulos, 1980).

The primary purpose of data and information collected from the EMIS unit is to manage and keep the education system in check, define priorities, plan and formulate policies and follow-up and evaluate the latter.

Wilson (1993) explained that decisions are impossible without information and managers are constantly in quest of more and better information to support their decision- making. In line with this Carrizo and others (2003) noted that without data, no system can function rationally and consequently no operational decision can be taken.

For this reason, educational information obtained from EMIS unit is vital for sound decision-making, planning and budgeting, monitoring and evaluation purposes. Without relevant, reliable and timely data, therefore, decisions are difficult. Thus, educational administrators need quality data to make sound decisions.

The education system is composed of a multitude of interacting actors at different levels who need to be informed on the status of the system, its achievements and performance, its needs and short comings. Although interacting with one another, these actors have different and varied information needs which the information system should take into account and respond to appropriately (Carrizo and others, 2003).

Policy-makers, planners, policy analysts and other high stakeholders are the users of the data and information. The demand for using data and information should stimulate and cultivate the healthy development of an information- based decision- making culture and the EMIS system. In addition, Tegegn (2003) noted that the users of information are central to EMIS functions and management.

Additionally, MoE (1999) indicated that the information needs of different stakeholders in the programs would vary according to their roles and responsibilities in management and implementation. This implies that information is required in different forms of presentations and in different levels of aggregation to meet the needs of the users. Moreover, diverse presentations are required to ensure the utilization of information.

Responding to the challenges of the education system of the late 1980s and early 1990s and based on the declarations of the constitution, the government of Ethiopia Federal Democratic Republic designed the Education and Training policy of 1994. Within the framework stated in the Education and Training policy and strategy (ETPS), the government designed the Education sector Development program (ESDP) that includes the national priority areas and MDGs and strategies. The main trust of ESDP is to improve educational quality, equity, efficiency and relevance with special emphasis on achieving UPE by 2015. The strategies and the programs are being put into operation both of national and regional 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 storing EMIS data and information (MoE, 2002).

Hence, to realize the government policy and strategies, ESDPs, MDGs and EFA goals, the responsibility for implementation of the plans has been given to regional and sub-regional levels. Moreover, the programs success or failure, further planning and decision making all are supported by EMIS data and information. It was expected to implement with these grounds that

the need for EMIS functions has long been recognized in the ESDPs program action plan for monitoring, review and evaluation at regional and sub-regional levels.

In light of this, Tigray is one of among the regions in Ethiopia. It lies in the Northern part of the country extending from 12° 5' to 39°39' E. Its capital is Mekelle. And it bordered by Eritrea to the North, Sudan to the West, Amhara region to the South and Afar region to the East. The Region is estimated to cover a total area of 50,078.64 square kilometer with population of about 4,646,197 millions of which 51% are female (2010GC). More than 83 % of the Region population estimated to reside in the rural areas highly depends on agriculture for their subsistence, employment, and income source. Currently, the Region classified under 7 zones: Central, Eastern, Southern, Southern-east, Western, Northern-west and Mekelle City. Moreover, the region further divided into 46 Woredas (THB, 2010).

The management and administration responsibility of the region education system is given to the Region Education Bureau. And in 2008/09 academic year, there were 1906 primary (1-8) and 96 secondary (9-12) schools. Within these schools there were 22,069 primary (1-8) and 3191 secondary (9-12) teachers. In these educational levels there were 1,000, 626 primary (1-8) and 125,419 secondary (9-12) students. The GER of the region was 107.1, 50.2 and 11.4 for primary (1-8) general secondary (9-10) and secondary (11-12) respectively. And the NER of the region was 97, 23 and 5 for primary (1-8), general secondary (9-10) and secondary (11-12) respectively. Additionally, the education expenditure in government budget (in million birr) was 468.46 and 47.03 for recurrent and capital respectively (MoE, 2010).

Therefore, the main intention of this study is to examine the problems and prospects of EMI supply and demand in Tigray Region.

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

Many years of research have provided clear evidence 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 requires 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 (Hua and Heristein, 2003)

Demand for data to support decision making continues to be limited and capacity for data use is weak.

The Ethiopia education statistical data quality to some extent was poor, and suffers from the organizational defects, and procedural weaknesses (Attifield and others, 2002).

In Tigray there was no comprehensive study made so far regarding the supply and demand of Education management information. However, concerning EMIS different studies have been made by different researchers at different time. To mention some, Jeilu (2001) in his study titled "Decentralization of educational management a case study in Oromia" has identified lack of good capacities in terms of organizational structures and managerial capacity of education management information systems were observed. Moreover, Kassaw's (2001) study entitled "Preparation and Utilization of Education Management System in Ethiopia Problems and Prospects" obtained the following results: inaccurate data production, the data is not timely; and the EMIS functioning towards the satisfaction of information users was inadequate.

And Ayana (2002) in his study title "Determinants of Educational Information system in Amhara Regional Education Bureau" forwarded the results of less reliability, poor organization and integration of information, the EMIS is inefficient and ineffective. In addition Tiye (2006) in the study of "Education Management Information system under Decentralization its practices and problems in Oromia region" forwarded that EMIS functions in its decentralization form was insufficient, the data and information were irrelevant and inadequate, and the schools' data and information were inaccurate.

In addition Ayalew (2009) studied on the "planning and management of EMIS in Addis Ababa City Administration". The result of the study indicates that information was highly utilized for reporting purposes, but it was found that utilization of information for planning, monitoring and evaluation and resource allocation was low. There was also no information communication at all levels. In addition, Mengistu (2010) also made a research on "An assessment of the Development of EMIS and its Challenges in Addis Ababa City Administration" and obtained the following results: in its current status, EMIS was providing different kinds of education information to the users. However, the relevance, quality, and timely of EMIS was not adequate to satisfy the users.

### **1.3. Objective of the Study**

#### **1.3.1 General Objective**

The general objective of the study is to assess the practice of Education management information supply and demand in Tigray Region.

#### **1.3.2 Specific Objectives**

- To assess the efficiency of EMIS in producing of timely, relevant and reliable data and information.
- To point out the major education data / information demand by and supply to users.
- To examine the extent of information utilization for different managerial functions.
- To explore major factors that hinders EMI supply and demand.
- To propose solutions that could solve the identified problems.
- To give recommendations on ways by which the region's EMIS is improved.

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

This research is significant for the following reasons:

1. The study may help to aware timely and relevant information for planners and decision makers.
2. The study may point out directions for proper collection, recording and of reporting educational information.
3. It may open room for discussion and as a result policies, strategies and performance of EMIS may be improved.
4. As no detailed research has been done on this topic so far, the result of this study will be used as a springboard for those who want to engage in further study on the same issue.

### **1.5 Delimitations of the Study**

Mainly, the major intention of this study delimited to Tigray region, this is because, in the region there are serious problems regarding education management information supply and demand that needs systematic investigation as indicated in the statement of the problem.

It will be again delimited to the EMI supply and demand aspects like the EMIS functions, major information demanded and supplied, utilization of EMIS outputs and major problems that hinder the EMI supply and demand.

Besides, the study was delimited to 3 zones, 12 woredas, 36 complete primary and 12 general secondary government schools. The rationale behind this is that there was no detailed and systematic study conducted in the area of problems and prospects of EMI supply and demand in the Tigray region. And the size was delimited just to keep the study manageable to the available human and material resources. Regarding the delimitation of the level of schools (complete primary and general secondary) complete primary schools are the concern areas of national and international priorities-ESDPs, EFA, MDG goals. Thus, to ensure and achieve these goals, collecting relevant, reliable and timely information is mandatory. Moreover, general secondary schools are the base for technical and vocational and higher educations. Furthermore, respondents were only TEB and WEO EMIS personnel, school principals and record officers. Because, there are no other individuals who have direct roles and responsibilities on EMI supply and demand than the indicated ones. In addition, TEB, TFEDB, WEO, WFEDO and NGO heads/ officials were included to obtain in-depth information.

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

The first limitation of this study is that due to the implementation of Business Processing Re-engineering (BPR), the respondents were mostly new assignees who have less knowledge on EMI supply and demand aspects of the region. However, to reduce the impact of weaknesses in this respect, previous principals and EMIS personnel were used as available as they were in responding to the questionnaires.

Besides, all users of educational information should have been included in the sample. Due to the large scope of the study it became difficult to incorporate teachers, students, parents, other governmental and non-governmental organizations. However, efforts were made to include some governmental and non-governmental organizations.

## 1.7 Definition of Operational Terms

**Data-** Consists of facts and figures that are relatively meaningless to the

**EMIS-** is a system for the collection, integration, processing, maintenance and dissemination of data and information (Cassidy, 2005).

**Information demand-** is the value on having good statistical information (Jeilu, 2009).

**Information-** is processed data that is important (Ibid).

**Information supply-** is the collection, analysis and production of data (Ibid).  
user (Mengistu, 2010).

**Woreda-** a division or area marked off, developed for administrative purposes, with defined authority and responsibility with the estimated population of about 100,000 people (TGE, 1992).

## 1.8 Organization of the Study

The study will have five major parts. The first part of the study is introduction: containing the background, statement of the problem, objectives of the study, significance of the study, delimitation, limitation, operational terms and organization of the study. The second chapter deals with the related literature. In the third chapter the over all methodology employed and statistical tools described. The collection of data presented, analyzed and interpreted in the fourth part of the paper. Finally, the findings have been summarized, conclusions have been drawn and recommendations have been forwarded at the fifth part.

## CHAPTER TWO

### 2. Review of Related Literature

This chapter deals with the review of related literature which comprises over view of information, information system and EMIS, EMIS functions, life cycle of information management system, Utilization of EMIS outputs, EMI supply and demand practices and challenges and EMI supply and demand in Ethiopia.

#### 2.1 An Overview of Information, Information System and EMIS

##### 2.1.1 Information and Information System

To be an effective manager in any area of business, you need to understand that information is one of an organization's most valuable resources. The term 'information', however, is often confused with 'data'. The two words are used in a confused way. The terms are often used interchangeably. Some time simply being substituted for each other without distinction. However, they are not synonymous, but inter related. Different scholars in the area justified the same. For this study, both terms are used interchangeably.

According to O'Brien (1993) the terms data and information are often used interchangeably. However, it is better to view data as raw material resources that are processed into finished information products. Information can be then defined as data that has been converted into a meaningful and useful context for specific end users.

Additionally, Doyle (2001) and Stair and Reynolds (2008) defined data as raw facts, and information is a collection of facts organized so that they have additional value beyond the value of the facts themselves.

Information, which in essence is the analysis and synthesis of data, will unquestionably be one of the most vital corporate resources (Koory and Medley, 1987; and Laudon and Laudon, 1988). Therefore, information now a day is considered as a resource on the level of money, material, facilities and people (Kanter, 1992; and Senn, 1987). Hence, data are facts and figures that are relatively meaning less to the user, but information is processed data, or meaningful data.

Hence, an information system is considered as an integral part of an organization and exists to serve information needs of the organization and others. To survive, therefore, every organization including education must have an information system.

Generally, within educational context, the information system should have a vision of the education system and integrate, in this manner and in a coherent way, the data and information coming from different sources.

### **2.1.2 Education Management Information System (EMIS)**

EMIS is a system designed systematically to collect, process, analyze, publication and distribute of educational data/ information related to the management of educational development (Tegegn, 2003).

In addition, Cassidy (2005) explained as EMIS is a system for the collection, integration, processing, maintenance and dissemination of data and information to up hold decision making, policy-analysis and formulation, planning, monitoring and management at all levels of an education system. And it is also a system of people, technology, models, methods, processes, procedures, rules and regulations that function together to provide education leaders, decision makers, managers at all levels and other stakeholders with a comprehensive, integrated set of relevant, reliable, accurate, and timely data and information to support them in performing of their duties and responsibilities.

Moreover, an EMIS is also a set of formalized and integrated operational processes, procedures, and cooperative agreements by which data and information about schools and schooling, such as facilities, teachers, students, learning activities, and evaluate outputs, are regularly shared, integrated, analyzed, and disseminated for educational decision use at each level of the educational hierarchy (Hua & Herstein, 2003).

According to the definitions given above, EMIS is a system unit that function educational planners and managers with information services that help them in decision-making, planning and control.

Generally, it is indisputable fact that, EMIS is a tool for planners, decision-makers, internal and external stakeholders in addressing accurate, relevant, reliable and timely data and information to the education system and to the external environment. And it plays pivotal role in collecting,

analyzing and distributing data/ information on education system to improve quality education, resource allocation, planning, controlling and decision making. Hence, due attention should be given to strengthen EMIS; basically higher level decision-makers should understand the importance of EMIS at all levels of the education system and allocating the required budget and training of personnel for the successful achievement of it.

## **2.2 Information Management Life Cycle**

An information system serves its users, requiring these users to be identified as the initial step in the information management life cycle. And to meet the data and information need of different groups, the process of data collection, data entry, data processing, data analysis, and data reporting should be short, efficient, and productive (Hua and Heristein, 2003).

According to Carrizo and others (2003) to build up EMIS, considering of its functional components is very essential. Components of data collection, data processing and analysis, construction of indicators to help decision-making, and dissemination and distribution of information produced by EMIS to different concerned structures and to the general public.

Therefore, to satisfy the information needs of users and to improve the efficiency of the education system, the production of information should effectively pass through each step in the information management cycle.

### **2.2.1 Data Collection and Processing**

Statistical information concerned to education can be collected to identify ways. One can basically list four ways of data collection methods. These can be applied in a well-organized data collection program (a) annual census of all the education and administration establishments; (b) systematic transmission of gathered and assembled data of administrative needs; (c) periodic or selective surveys based on a representative sample of schools and aimed to collect information on particular questions, and (d) general population census or household surveys on questions other than those pertaining to education (Carrizo and others, 2003). This implies in education system. Carrizo with others pointed four different methods used to collect data/information. But this is not to mean all the methods used in the same manner. They differ in scope, content and form.

Beside, Aziz and others (1990) highlighted there is a great deal of variety within and between education systems with respect to the ways in which information is requested, collected and used. But the corner stone of yearly data collection is, the 'school censuses'. Therefore, among the

methods used to collect data/information from schools, 'school census' is the main and the most common method.

The development of countries capacities in area of education planning, management and administration must be employed firstly through a development in data collection regarding the activities of the sector. Hence, Carrizo and others (2003) data collection should include all the fields covered in EMIS. Data like demographic and financial data, generated by groups are also very essential to quality of EMIS information.

The overall design of data collection process, data collecting tools development, and design and development of computer database application must be seriously made by using of specialized personnel to increase the reliability of data (Hua and Herstein, 2003). Therefore, the design of such an instrument, however, must be developed extremely carefully. The items, the layout, and the syntax must be well developed (Carrizo and others, 2003 and Tegegn, 2003).

To sum up, collection of data /information from schools is very important to made sound decision. Therefore, the instruments used for this purpose should be designed and prepared carefully. And the clarity of the 'school census' increases the reliability of the data/information.

Beside UNESCO (2002) summarized that systematic data collection is mandatory, particularly for developing countries where the infrastructure and the school condition affect enrollment, gender equity and quality. Therefore, Turcano (2006) pointed in response to the various data collection problems in Nigeria prior 2004 efforts were employed to redesign the census forms by considering of the needs of stakeholders. Beside efforts were also employed to ensure that the data was designed in order to monitor the indicators related with the MDG/EFA and UBE.

However, once you have collected the school data, you need to plan how to organize so as to usable for planning purposes. But, when data is not well organized, it can not be properly utilized for planning, managing, researching, monitoring and evaluation of the education system. Therefore, the data processing is one of the main activities on information management cycle (Tegegn, 2003).

According to Carrizo and others (2003) the late information processing and their availability at the different levels of EMIS unit will depend on the quality and the rationality of computerization. The first phase of the processing consist a new verification of data and their internal coherences. The second phase is constitution of a new database or, if this has already

been employed, the formation of new data into the database. And the third phase concerns the statistical processing of data.

Ross and others (1990) the data preparation phase is concerned with transformation of a raw data in to a form that is suitable for later analysis. And involves two steps: data coding and data entry. Besides, Casley and Lury (1987) verified the preliminary phase of data processing includes reception on the data, editing and coding, initial examination and data entry.

To sum up, the data collection phase is fundamental step in the process of EMIS. Therefore, during data collection high attention on the quality of the instrument, the scope of the data to be collected, the need of stakeholders and the value of the data on the system are very important. Beside, preparing the data by applying appropriate steps and techniques are crucial to produce good data and information.

### **2.2.2 Data Analysis and Reporting**

After data collection and processing is made, the next procedure of the cycle is data analysis. And it involves looking more attentively at the data, and in various ways, in order to extract information useful for planning and decision making (Tegegn, 2003). Hence, data analysis is a stage which needs care to address the information need of different stakeholders found in different levels of the administrative hierarchy.

The data analysis stage is mainly concerned with the preparation of usable summaries of the data that have been collected and prepared for analysis (Aziz and others 1990). Hence, summarizing of data for different purposes held under this stage. Therefore, effectively summarizing and preparation of information improves the reliability of data/information.

Moreover, Carrizo and others (2003) noted analysis enables a primary verification through comparison with outputs of the last year. And the next verification continues by using several elements which will enable to decide the presence of undetected errors in next phases of the cycle. This data analysis has to be done rapidly to produce brief report results taken from the newly processed data.

Nobody does data analysis just for the sake of it self. It should be done with users in mind. It is employed to give information to planners, decision-makers, researchers, policy-makers, and other users so that they can judge whether their actions are appropriate or the actions need to be

on the level of users and their needs. At the first level, a short and synthesized information report distributed to leader and managers of the education system so as to provide them with the most recent information and at the second level, the information is distributed for much larger circle of users in the system. Therefore, the distribution of information includes the use of both web-sites and printed media to address need of users.

Dissemination refers to the action of distributing information using a variety of media. And according Tegegn (2003) it takes a number of forms: regular distribution of statistical abstract, quick references, indicators' reports, pamphlets and posters. Moreover, it can be internal and external. Internally, information is disseminated at all levels with in the MoE. However externally, it will have to be disseminated to users outside the MoE.

Once data and information produced and distributed, the products will be consumed to various purposes. Then feedback can be collected. Feedback create conducive environment for learning. Through the obtained feedback we will know and understand of our achievements and clearly show where problems need correction (Ibid). Hence there is a need that mechanisms for collection of feedback be encompassed in the annual information plan of the information system's life cycle.

Generally, to produce relevant, reliable and timely data and information, and as a result to satisfy the need of internal and external users, establishing and effectively applying procedures of the information system's cycle is vital.

### **2.3 Utilization of EMIS Outputs**

EMIS primarily serve the functions of planning, controlling, and decision making at the management level (Laudon and Laudon, 1988). This implies EMIS provides support for management at all levels: operational control, and strategic planning. Each of these classes of management activities uses information for planning, control, and decision-making.

Fundamentally, effective management for resources invested in education is driving the development of education management information system (EMIS). Monitoring and evaluation programs and outputs using on EMIS provides information, which can be used to improve efficiency, optimize resource allocation, and reinforce performance. At the local level, learners and parents, as well as education and training boards and PTAs require information about educational performance and outcomes in order to make sound decisions and promote those

decision vis-à-vis local governments. In the often highly politicized context of planning and resource allocation, an effective EMIS can play a pivotal role (Loxley, 2004).

Hence, EMIS provides managers, parents, learners, Boards and PTAs with feedback they need about a system and its operations. Thus, information enables to allocate resources, redesign plans, or reorganize procedures to accomplish objectives successfully.

Beside, Chapman and Mahlck (1993) argued that information can be used to improve educational quality in four principal way by (i) providing data that are used directly to secure or allocate resources (ii) constraining 'bad' decisions (iii) detecting inefficient resources use, and (iv) supporting mechanisms that offset the impact of resource.

Moreover, Carrizo and others (2003) pointed EMIS should generate information for users in the following essential fields: Management and administration of the education system, Research on and planning of the education system (Macro and Micro); and Monitoring and evaluation of the education system.

In summary, EMIS should play a significant role in collecting, processing, storing and distributing information to assist decision-making, policy formulation, managing modern organizations as well as providing accurate, relevant, reliable and timely information to the users for the purpose of planning, management, and control and evaluation of the education system.

### **2.3.1 Planning and Management of the Education System**

Planning is one of the key responsibilities of top-level managers. And the planning function provides a basis for decision-makers at all levels of the organization to formulate and achieve objectives and goals. Through planning management determines a course of action for the future. The planning function also determines the activities, personnel, and controls that are needed to implement a particular course of action. Planning is the basis of sound management at all levels (Koory and Medley, 1987). With out planning, therefore, there are no criterions by which to measure individual, departmental, or organizational performance.

Planning at each level of the hierarchy requires various types of information to be existed at different levels of aggregation. Somerset and Ekholm (1990) noted information to be used in educational planning; therefore, the format and delivery of the information had to be analyzed to specific interest of different decision- makers.

### **2.3.3 Monitoring and Evaluation of the Education System**

Monitoring is a tool to investigate into, observe and learn not only what has been done but also what deficits were encountered on the path. More specifically, monitoring help us to see how these deficits were tackled and pave the way for future enhancement of the implementation program strategies and policies (Tegegn, 2003).

Successful management of today's education system needs effective policy-making and system monitoring through data and information (Hua and Herstein, 2003). Therefore, information-based decision making in the management of the education system fosters its efficiency and effectiveness through well designed monitoring technique.

According to Carrizo and others (2003) informed decision-making is important in the management and planning of education, and have key role within the context of monitoring of education policies. Hence, information is an essential element in the effective monitoring of objectives of education policies.

Beside, monitoring system progress against the broadened set of goals and formulating and adjusting education policies to assure successful attainment of goals and objectives require access to much more and more detailed data and information than in the previous time. And it requires integrated data and information on inputs, outputs and processes (Carrizo and others, 2003). Since, detailed and effectively processed data and information help to control the progress of the education system against the set goals and objectives. And it helps to compare the resources consumed with the products/outputs obtained through educational processes from lower levels to upper levels.

EMIS provides efforts used to monitor the performance of an education system. It also closely monitors the fair distribution of resources, and plays a key role in providing information to higher decision makers about deployment of teachers, students performance assessment, internal efficiency of the education system (Tegegn 2003). Therefore, the information generated by EMIS makes it possible above all to control the internal and external efficiency of the education system.

However, evaluation is an internal or external management function to assess the design of the program and the implementation of methods in achieving the objectives. Thus, Tegegn (2003) verified evaluation involves looking back to what we have done and realizing the strengths or

weakness, learning what to modify, and extracting 'good practices' for further implementation to ensure better performance.

The value of evaluation lies in the actual use of the given information through evaluation work for making or changing strategic decision(s) that added benefits and values for systems, institutions, and individuals who are in them (Hua and Herstein, 2003). Hence, system evaluation must be put in place for requiring routine data collection and analysis. For this reason, EMIS is a prerequisite for evaluating activities.

According to Carrizo and others (2003) the objectives formulated in 1990 during the Jomtien conference aimed universalize primary education and decrease by half the illiteracy rate of adults from 15 years and above by 2000. The data and information produced by EMIS should make it possible to judge. Thus, an effective and efficient EMIS is fundamental in evaluating the progress and impact of these objectives. Therefore, evaluation, a managerial function, highly depends on data and information produced by EMIS to judge appropriately the attainment of goals and objectives of the education system effectively and efficiently.

However, data and information presented in the form of time series is not sufficient, analytical information's are fundamental. These analyses provide the room for evaluating the exact situation and it promotes to identify disparities, and to study the limitations, the obstacles and problems and as a result to determine the necessary programs, strategies and policies in the attempt to overcome them.

Generally, monitoring and evaluation (M&E) in education system depend heavily on EMIS data and information. It is thus indispensable to ensure that the physical and financial resources invested in the system are not wasted.

## **2.4 The Practices of EMI Supply and Demand in Developing Countries**

In both developed and developing nations over the last 40 years there has been a steady growth of interest in establishing and expansion of educational information systems constructed to provide data and information that will allow with decisions regarding planning the quality of education (Levin and others 1990). However, the development of an effective EMIS is a complex and expensive undertaking under the best conditions. In designing EMIS, therefore, it is important to consider the needs of all the groups that utilize EMIS outputs.

Efforts to enhance more comprehensive, and integrated EMIS to support the monitoring and evaluation of education system performance and crafting of effective education policies began in some countries as early as in the late 1980s and continued throughout the 1990s and into the new millennium. More recently, efforts have begun in many countries to computerize routine administrative and management functions in regional, district, municipal offices and schools (Cassidy, 2005).

However, the experience of establishing and properly functioning of EMIS unit to improve the quality of education and to provide adequate, relevant, reliable and timely data and information to users is different from country to country.

Therefore, these are some very promising examples of good practices, in terms of data collection, analysis, dissemination and utilization, and functions of EMIS which are considered as lesson learned to our EMIS systems.

#### **2.4.1 Lesson Learned in EMI Supply and Demand**

As good practice, Namibia (Voigts, 2000), and Ghana, Mozambique and Nigeria (Trucano, 2006) could be a lesson for EMI supply and demand in Ethiopia.

The collection and processing of educational data reform was made in Namibia. And data collection, analysis and dissemination were included in the reform. As a result demand responsive and user-friendly a data and information could be obtained and disseminated. The level of aggregation of users at different levels is not similar. So that, according to experience of 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. Moreover, by considering accessibility of the sources, reliability of data, and its costs, the best sources of data are determined. Lastly, the database is designed before the design of the schools census questionnaire. This step helped to designing a good database not constrained by the existing questionnaires, while the questionnaire designs to success from being based on an efficient data structure (Voigts, 2000).

Additionally, in case of data collection, experiences of Ghana and Nigeria concerned that in response to the various data collection problems attempt was made to redesign the census forms taking into account an active involvement of stakeholders and district offices in the development and distribution of information. Therefore, this has enabled stakeholders to develop a sense of

ownership. And this motivates to fill the data and information accurately and timely on the questionnaire. Moreover, it has initiated schools and district office to use the data for their planning, managing, controlling and evaluation purposes (Trucano, 2006).

The evidences from the above countries revealed that the processes of collection and analysis of data bounded by a number of problems and difficulties, including lack of commitment from those involved in each activity and those associated with designing of census forms/ questionnaires. But, there are good experiences to be learned from these countries. Involving stakeholders and users in developing of questionnaire, collection and analysis of data, allow ensuring accurate, reliable and timely collection, analysis and dissemination of data and information. Beside, it develops the sense of ownership up on stakeholders and as a result promotes effective utilization of data and information.

In terms of planning and design, EMIS in Ghana can be taken as a model of best practice. In the reform process, initially giving attempt at data collection helped to support the development of the country's national education policy. Data collection, therefore, is one of the main objectives of the EMIS. And it is considered as the system's backbone. More recently, attempts have been made to align the policy of decentralization with the collection and analysis of education data at the district level. In addition, EMIS plays an important role in formulation of strategic policies, development of operational plans and monitoring of subsequent progress towards predefined targets. It should also include the national and international goals MDGs /EFA and UPE. And all the information's contained in the preliminary education sector performance report (PESPR) is obtained from EMIS (Trucano, 2006).

Lesson learned is that the decentralization policy of collection and analysis to ward district levels allow preparing well-informed operational plan and budgeting. The planners and administrators can obtain adequate and timely information from EMIS unit with in short period of time because there couldn't distance constraint among data provider, data processor and information users. And these conditions promote the planning process to be effective through using appropriate information. Moreover, the planning process includes monitoring of the plan implementation, regular updating of sector analysis information, assessing the results and the impact, and feeding implementation.

The practices in the use of ICT also vary with countries. In Namibia, there is a capacity to respond to ad-hoc requests for statistical information based on rational database. Mozambique practiced a donor-supported minimalist approach to the development of EMIS outputs. The advantage of this approach is that its transparency and operationally easy to use (Trucano, 2006 and Voigts, 2000).

The development of IT networks and infrastructures around EMIS in Nigeria can be taken as an example of best practice for other developing countries who are seeking technical reforms to their EMIS. The reform was adopted in different strategies. First, before the reform applied to the whole country. A small scale pilot study was undertaken to one state to identify the challenges and opportunities. The second strategy attempted to skill of operators, need of stakeholders and operating environment. And in response to perceived problems a new EMIS infrastructure, with web-based networks and appropriate software, is developed for adoption in states to improve the information quality to users (Trucano, 2006).

Therefore the experience of Nigeria lessons us that establishing strategies and the efforts to identify the needs of stakeholders ensures the sustainability of EMIS. Giving attempt to take pilot in small area enables it to magnify the difficulties and opportunities and this condition facilitates the development of EMIS infrastructure toward the whole country with appropriate and suitable environmental operating condition. The designing of software and accordingly the development of web-based networks locally ensures cost-effectiveness. Therefore, EMIS is significantly improved and expanded by embracing ICT. To be this true, designing clear plan and developing strategies of EMIS infrastructure are essential components of effective management.

An equally important part of managing EMIS concerns how the information is disseminated? Evidences about dissemination of EMIS output existed at different degrees in countries. For example, Ghana for disseminating EMIS outputs and the mediums using for such data and information are annual digest of statistics, electronic copy and performance report. In Mozambique, based on the statistical EMIS the planning department in Ministry of Education and culture (MEC), produces annually two main statistical outputs: annual school survey and annual school results. In Namibia, reports were printed to disseminate them to different stakeholders and users. And the EMIS outputs were released in the form of booklets, posters, slideshow, holding policy dialogue, and in the form of reports (Trucano, 2006; and Voigts, 2000).

On top of this effective dissemination-communication is vital to respond the data and information needs. All users are not the same. They differ in seeking various kinds of data and information, and the technique of distribution. It is difficult to address the statistics in the form of printed copies to all users. It is costly and also wastage due to needs difference among users. Therefore, disseminate by using of different techniques: printed copies, internet website, display materials, oral presentation and public dialogue will be vital to effective communication.

In Namibia, the utilization of information has often been reported as a major obstacle in the development of information system. A number of efforts have been made to solve the problems. And the development of EMIS in the country produced several results which can facilitate and develop the information utilization by different groups. Hence, the following can be taken as results of the development of EMIS: consistent collection of education statistics in two annual surveys together with the production of two annual reports, capacity to respond to ad-hoc requests for statistical information, the existence of educational statistical data set that satisfy needs of the users, linkage of GIS information to the EMIS database, and the development of capacity to conduct research and special surveys (Voigts, 2000).

From these countries, the experience under decentralization management system enhances utilization of education statistical information. This can be developed through designing the questionnaire of the school census by involving different stakeholders, establishing ICT infrastructure, developing software and database, appointing skilled EMIS personnel at each level. This in turn develops the sense of ownership as a result increases the production of relevant, reliable and timely educational data/information at each level the education system. Therefore, the service of EMIS should strengthen the relationship between of information supply and information demand.

#### **2.4.2 Challenges of EMI Supply and Demand in Developing Countries**

With the growing global demand for information and the expansion of education system, the demand for EMIS has increased tremendously. However, building EMIS in developing countries has not been an easy task. There are still challenges which impede the EMI supply and demand.

There is no universally accepted definition of EMIS throughout Latin America and Caribbean regions. There is not common understanding to the meaning, vision and functions of EMIS. For example, for some people EMIS is any effort to improve quality data and information, for some it is simple and updated, computerized statistical information system. Others refer to any administrative function specific database system, and for others it is all about computers and computerization (Cassidy, 2005). Therefore, lack of standard definition and lack of common understanding/shared vision impede the development of EMI supply and demand.

Besides, Hua and Herstein (2003) described lack of a culture of communication and information exchange which is arising due to poor management and poor coordination within Ministry of Education. In addition, lack of shared vision of EMIS can be existed whenever there is lack of common sense for the future success of the education system. Moreover, lack of organizational readiness can be resulted from unclear line of accountability, redundant or non-existent responsibility and poor coordination. Furthermore, common institutional issues like low salary, high turn-over rate, low motivation, lack of skills to integrate and analyze data and lack of system and program monitoring and evaluation are the challenges that impede EMI supply and demand processes.

Generally, the EMI supply and demand processes are affected by different conditions which are related with the organizational management structure, management skills and personal and material constraints. Therefore, to produce quality data and as a result to satisfy the information need of users, developing the organizational structure, designing incentive structures, developing coordination and shared vision, equipping the EMIS unit with skilled personnel and materials are the mechanisms to be used to improve the effectiveness and efficiency of EMIS unit.

And according to Trucano (2006) Mozambique has been faced challenges as poor communication, lack of analysis, technical shortcomings, bureaucratic process, lack of budgetary information, inadequate data and information, and lack of dissemination. In Ghana, the following problems has been observed lack of support or commitment, lack of capacity, incomplete census coverage and lack of resources for IT maintenance. Nigeria has been faced difficulties like lack of reliable baseline data, coordination difficulties, limited in quality and quantity data on population and finance, lack of accountability and excess of waste.

Moreover, Tegegn (2003) pointed that building EMIS in some countries of sub-Saharan Africa has been encountered challenges as lack of awareness with in the MoE, problems related to budget allotment, lack of self-initiated learning, personnel shortage, over rating the capacity of EMIS, and lack of continuous training.

Furthermore, Voigts (2000) described that the greatest deficiencies experienced in Namibian EMIS were the following areas of information: adult education, finance, school resources, process and achievement, external efficiency and access of the education system.

Based on aforementioned problems and difficulties it can be possible to summarize under categories of EMI supply and EMI demand factors. Therefore, the EMI supply factors are related to the collection, analysis and production of data and information. It is basically concern to information system cycle. Thus, lack of data collection methods, lack of analysis, technical short comings, lack of adequate data and information, problems in dissemination, shortage of resources for ICT maintenance and the like can be considered under this category.

On the other hand, the EMI demand factors are the values on having good statistical data and information. Therefore, lack of believes on evidence based policy- making, decision-making, planning, and monitoring and evaluation, lack of commitment or willingness to have shared vision to enhance the development of EMIS and lack of attitude to use accurate, comprehensive and timely data and information can be considered as EMI demand factors.

Generally, information supply and information demand are the two fundamental components of EMIS. Information is only having value when there is a use for it. This means, the value of information relies on the demand for it. They can be considered as "two faces of a coin". Both are inseparable. Therefore, the development of healthy information based decision- making culture is highly depending on the decision-makers demand for information. Additionally, supplying accurate, relevant, reliable and timely data and information is also important to users. However, currently, it is usually very difficult to obtain healthy data and information to make sound decisions and to satisfy the information need of users.

## **2.5 EMI Supply and Demand in Ethiopia**

In 1957, the need for systematic statistical information was considered as basic resource for economic management. After this, compiling statistical information becomes a regular government task (Mengistu, 2010).

The rapid economic, socio-cultural and political change of the country brought the emergence of the overall national planning in different sectors. And the need for the establishment of educational statistics was related with this development (Kassaw, 2001).

Beside, Mengistu (2010) described the organizational structure of MoE developed in 1957, and consequently, research and statistical bureau established as one sub-system. A decade later it was renamed as plan and statistics division under the department of program, plan and Research. And Kassaw (2001) pointed due to the expansion of the system between 1960 and 1974, the collected and organized data from woredas, Awrajas and Administrative Regions was only published manually.

However, due to the growth of the education system, the development of ICT and the emergence of strong demand for data and information, MoE have been enforced to collect and organize adequate and reliable data and information. Therefore, Mengistu (2010) noted MoE has taken measures to improve technical skills of personnel and the processes of data collection, analysis and distribution. In addition to this the ministry emphasized on a project for computerized data processing which was initiated with 1982/83 data. This implies centrally processing and dissemination of data/information reflect the interest of the top level administrators. However, lower level personnel and other users couldn't have got the chance of participating in preparation and dissemination.

According to Tiye (2006) till the downfall of the Dergue regime in 1991, data and information was centrally processed and disseminated. But Tegegn (2003) argued decentralize the data processing to the lower levels of the system have a greater chance of increasing the accuracy data and obtaining timely reports. Therefore, decentralizing responsibilities to the lower level of the education system enables to get accurate, reliable and timely data and information, and facilitates the planning managing, controlling and evaluation processes.

Literatures implied that EMIS in Ethiopia was developed in 1990s with the donation from NESIS and SIDA. But it was ineffective and inefficient. It was bounded by different problems like lack of skilled manpower, inadequate materials, quality of data are some of the deficiencies.

The use of ICTs in education system is fundamental as the World Education Forum concluded at its Dakar conference in 2000, while some progress and been made since the Jomtien conference a

decade earlier, large number of people were still without a basic education and that more effort was required to meet the Education For All (EFA) goals (Carrizo and others, 2003). Therefore, the development of EMIS determined by: Changing goals and objectives, Education for all, Decentralization management and decision-making, civil society initiatives and scarce resources (Cassidy, 2005).

To sum up, the development of EMIS is determined by the above factors. These factors motivate the expansion of education system. As a result much more data/information is collected for national/international purposes. Thus, this situation leads to use IT and to develop EMIS unit.

Responding to the problems of the education systems of the late 1980s and early 1990s, the government of Ethiopia Federal Democratic Republic designed the Education and Training policy (ETP) in 1994. And the policy articulated the decentralization of education management and decision-making to regions. Although, The REBs have diverse policy responsibilities to establish efficient EMIS to ensure effective operation of the national and federal polices (MoE, 2006). Hence, at region level, EMIS unit is established to collect, analyze, and disseminate data/information. The progress of educational activities of the regions evaluated based on the obtained data/information.

Attifield and others (2002) pointed that Ethiopia-school level educational data are collected via an annual school questionnaire. Data aggregation is carried out manually at woreda, zonal and regional levels as a way of providing regional and sub-regional information needed for planning. In most of the regions, extensive regional and sub-regional reports have been prepared using computers. After completion of data collection, computerized regions send their data through diskettes while other regions send the questionnaires to be entered, edited and prepared for proper utilization. Finally, national descriptive statistical reports are produced annually and disseminated.

However, to develop the efficiency and effectiveness of the EMIS unit at each level issues of training skilled personnel, allocating sufficient budget, materials and facilities and supporting each level of the system while collecting data, processing, analyzing and disseminating phases are crucial.

Currently, the EMIS unit of the MoE of the Federal Democratic Republic of Ethiopia, with considerable assistance of the regions, collects data on basic variables from all levels of the education system based on standard questionnaire designed for the pre-primary (KG), Non-

formal Adult Education, Alternative Basic Education (ABE), General primary and secondary Education College of Teachers Education (CTE), Technical and Vocational Education and Training (TVET) and Higher Education. The collected data are compiled and published annually in the Education statistical annual abstract (MoE, 2010).

Regarding information demand at school level, for example, Mengistu (2010) in his finding summarized that educational information like learning achievement of students, students number and performance, repeaters, personnel and teachers, school space, finance and materials were highly needed. Beside, at kebele level and sub city level of Addis Ababa City Administration, educational information related to teachers and personnel, students, finance and materials, school space and environment identified as highly needed. Besides, the data / information collected were available at all levels mainly in the form of printed copy. In addition, the data/ information were disseminated to users mainly through hard copy and meetings. Moreover, educational information was highly used for planning and budgeting, monitoring and evaluation, enrolment projection and project implementation. However, information rarely disseminated to users through soft copy and web pages.

On the other hand, the Tigray Education Management Information System Service (TEMISS) prepare Education statistics Annual Abstract based on access, quality, efficiency, equity, and plan and achievement of the budget year (TEB, 2010).

This implies education system of regions established EMIS unit to collect data/information from schools and disseminate through educational statistics annual abstract to ward users.

Generally, in the decentralized system as the responsibilities are fall down to the grass root levels, the chance of obtaining accurate and timely data and information will increases. And, it encourages the utilization of EMIS outputs for planning and decision-making purpose.

Moreover, to tackle aforementioned problems and to develop the proper functioning of EMIS to address the information needs of different users at lower levels of the education system, giving emphasis to issues like training of personnel, fulfilling of materials and facilities, and allocating adequate budget are mandatory. Furthermore, assessing the needs of stakeholders, preparing plan for the system, creating culture of effective communication and shared vision among the educational levels is very important. Over all, developing the capacity of EMIS unit is very essential for effectiveness and efficiency of the education system.

## CHAPTER THREE

### 3. Research Design and Methodology

#### 3.1 Research Method

To undertake the study, descriptive survey was employed. This method enables to study broad size area and to get an exact description of the current status of a topic under study (Seyoum and Ayalew, 1989). Therefore, this method allows gathering data from a relatively large number of cases at a particular time and it enables to describe the current status of the issue.

Beside, according to Cohen and Manion (1994) and Kumar (2007) descriptive survey is concerned with conditions that are existed, processes that are going on, effects that are evident, or trends that are developing. Hence, to study EMI supply and demand and to have a clear picture on the existed problems and as a result to attain aforementioned objectives of the study, the descriptive survey method becomes essential. In light of the basic questions and objective of the study, therefore, descriptive survey was employed to assess, describe and interpret the current status of EMI supply and demand in Tigray Region.

#### 3.2 Sources of Data

The combination of primary and secondary data sources were used to make the study reliable and informative. School principals, record officers, WEO and TEB EMIS staff, WEO, WFEDO, REB, RFEDB and NGOs heads/officials were the primary sources. Since, these bodies were considered as the main practitioners and users of educational data and information.

Moreover, Annual Statistical Abstract, annual data collection questionnaires, periodic statistical reports and employee profile documents were used as secondary sources to acquire additional data /information and to triangulate the study.

#### 3.3 Samples and Sampling Techniques

The study area is Tigray Regional State, which comprises 7 zones, 46 Woredas consisting of 1876 primary and 96 secondary government schools. Thus, the study population was 4 TEB EMIS staff, 92 WEO EMIS staff, 1972 school principals and 1972 record officers. From this study population the study included 3 zones, 12 Woredas, 36 complete primary and 12 general secondary government schools. They were selected by stratified random sampling technique.

Cohen and Manion (1994) and Creswell (2009) have noted that stratification ensures representation. Therefore, the sample populations were selected according to the following procedures.

Based on the geographical location/distance from TEB (Mekelle), the 7 zones were stratified into 3 sub-Regions/strata. Distance considered as determinant factor for EMI supply and demand activities and it has impact on the availability of infrastructure used to implement the EMIS activities effectively. As distance increases the availability of IT, electrical power service and continuous technical support from TEB will be decreased. Thus, the existence of these conditions influences the EMI supply and demand activities. Therefore, the first stratum was far distance sub-Region, which included Central, Northern-west and Western zones. The second stratum was average far distance sub-Region and represented by Eastern and Southern zones. The near distance stratum was incorporated Southern-east and Mekelle zones. A zone was simple randomly sampled from each sub-Region. Since, this technique employed to give opportunity of being selected as a sample. Therefore, Central zone from far distance sub-Region, Southern zone from average far distance sub-Region and Southern-east from near distance sub-region were randomly selected.

Beside, Woredas of each sampled zone stratified into two strata based on the number of schools. Since, number of schools was considered as determinant factor for EMI supply and demand activities and as the number of schools increases the collection, organization and analysis of data will be increased. Thus, these situations increase the burden and complexity of EMIS activities to be become difficult to manage congruence with the existing human and material resources. Therefore, the strata were Woredas relatively having large number of schools and Woredas relatively having small number of schools. Accordingly, from each stratum two Woredas were randomly selected.

Moreover, schools of each sampled woredas were stratified into two strata based on the number of students. Since, number of students was assumed as determinant factor for the issue under study and as the number of students increases the work load of collection, organization and analysis of data increases. Thus, these conditions in turn have a negative impact on EMI supply and demand activities. Hence, the two strata were schools with relatively large number of

students and schools with relatively small number of students. Based on this, four schools were randomly selected from each sampled Woreda.

Furthermore, 4 TEB EMIS personnel, 24 WOE EMIS personnel, 48 school principals and 48 record officers were purposely selected from Region, sampled Woredas and schools respectively. The total number of the sample population was presented in the table below.

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

Sample area			Individual respondents							
			For questionnaires				For interview			
Zone	Wor.	Sch.	Reg.	Wor.	Sch.	Total	Reg.	Wor.	NGO	Total
Southern	4	16	-	8	32	40	-	5	-	5
Southern-east	4	16	-	8	32	40	-	5	-	5
Central	4	16	-	8	32	40	-	6	-	6
<b>Total</b>	<b>12</b>	<b>48</b>	<b>4</b>	<b>24</b>	<b>96</b>	<b>124</b>	<b>2</b>	<b>16</b>	<b>2</b>	<b>20</b>

(Reg. = region, Wor. = woreda, Sch. = school)

### 3.4 Data Collection Tools

To obtain relevant data for the study, questionnaires, semi-structured interview and document analysis were employed.

**Questionnaires:** Questionnaires were used to collect data/information on characteristics of respondents, EMIS functions performed at each level, EMI supply and demand, utilization of information and problems that hinder EMI supply and demand. This tool was selected as a means of data collection instrument because it enables to collect wider information from widely dispersed sample population; and make possible an economy of time (Seyoum and Ayalew, 1989). Moreover, it helps to obtain unbiased factual data, opinions and attitudes in structural frame work from respondents. The questionnaires were both close-ended and open-ended prepared for two groups of respondents (TEB and WEO and school respondents). The open-ended items were prepared because they allow the respondents to generate relevant information.

**Interview:** Semi-structured interview was employed for TEB, TFEDB, WEO, WFEDO and NGOs (Action AID Ethiopia and REST) heads and officials. This instrument was selected

because it is a means of getting information directly from the respondents, to collect in-depth information and enables to ask various questions (Cohen and Manion, 1994; and Creswell, 2009).

**Document Analysis:** Document analysis was conducted to investigate its contents and presentation on 2008/2009 and 2009/2010 TEB Educational Statistics Abstracts, annual data collection questionnaire, periodic statistical reports and employee profile documents.

### 3.5 Data Collection Procedures

The data gathering instruments were prepared on the basis of the reviewed literature and the intended data to be collected. Before administering the instruments of data collection, it is very essential to standardize the tools as it gives the first chance to comment on and check its clarity. Accordingly, the thesis advisor was commented first then three master student colleagues were consulted to validate the questionnaires. Some revision was made based on their comments. Redundant item concerning barriers for information utilization was removed.

Beside, pilot test was carried out to assess the reliability of the designed instruments to collect data for the main study. In other words the try out was done with the objectives of checking whether or not the items included in the instruments enable the researcher to gather relevant information. It was conducted in Alamata Woreda which was out of the sampled study areas. During the try out 2 WEO EMIS personnel and 10 school principals were participated. The reliability of the questionnaires was finally checked by split-half technique of internal consistency procedures. Spearman Brown formula was applied to the product moment correlation between scores. Thus, the result was 0.81 for TEB and WEO and 0.78 for principals. Despite minor differences between the two groups, the test was reliable in both cases as statistical literatures usually recommended a test result of 0.5 and above as reliable.

Moreover, to collect the necessary data with the tools made ready, contact was made with TEB and WEO officials to get permission and necessary support for the research work. Assistant researchers were hired to administer the questionnaires. They were well oriented on the objectives of the study and the instruments employed.

Therefore, the questionnaires were administered to the respondents and the necessary data were collected by the help of assistants. Respondents were given adequate time (5 to 7days) to fill in

the questionnaires. The student researcher made a close follow up of the administration of questionnaires. Finally, concerning the interview, the student researcher carried out interview with TEB, TFEDB, WEO, WFEDO and NGOs (Action Aids Ethiopia and REST) heads and officials. Other additional information were collected through document analysis from 2008/2009 and 2009/2010 TEB Educational Annual Abstracts, AEC questionnaires, periodic statistical reports and employee profile documents by the investigator.

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

Questionnaires, interview and document analysis were used as tools for data collection from the study sample areas. The questionnaires were contained 108 and 110 items for the school and for TEB and WEO respondents respectively. Most of the items were likert like which measured attitudes based on five rating scales: strongly disagree (1) to strongly agree (5), very low (1) to very high (5), never (1) to always (5), and not a problem (1) to very serious problem (5). For ease of interpretation the five rating scales categorized under three levels: low ( $\leq 2.49$ ), average (2.5-3.49) and high ( $\geq 3.5$ ).

Beside, the data obtained from the field was tailed and tabulated in tables. Beside, depending on the nature of questions and the data collected both quantitative and qualitative analysis methods were used. Quantitative analysis method was used to analyze the numerical data and qualitative method used to analyze the respondents view obtained from open-ended items and interview. And as a result to validate the information obtained from the questionnaires.

For data analysis, respondents were grouped in to two. School principals and record officers were taken as school respondents and TEB and WEO EMIS personnel were taken as TEB and WEO respondents. The rational behind this is that the respondents were considered as having almost similar work experience and responsibilities on EMIS activities. Besides, there were only 4 EMIS personnel at region level (2 analysts and 2 data encoders). Moreover, the items of the questionnaires were similar to TEB and WEO EMIS personnel respondents. These conditions influenced the student researcher to combine TEB and WEO respondents in the same group for data analysis.

On top of this, descriptive statistical tools like frequency distribution, percentage, mean, average mean and standard deviation were used to show the aggregated opinion of respondents on issues raised. Moreover, to check if there were differences among respondents opinion independent t-test and Spearman rank order correlation coefficient were used at 0.05 significance levels. Frequency distribution and percentage used to analyze characteristics of respondents: sex, age, educational level, work experience and EMIS trainings. Besides, in order to rank information users mean, weighted mean and Spearman correlation coefficient were employed. Moreover, frequency distribution, mean, grand mean, standard deviation and independent t-test used to analyze EMIS functions performed at different educational levels, EMI supply and demand, utilization of educational information and problems that hinder EMI supply and demand.

As presented in Table 2, from the total respondents (116), 76.41 % were males and 23.59 % were females. In each group of respondents, majority of the respondents were males. Of the total respondents, the number of females was three times less than that of males. The figures clearly indicated that females' empowerment direction of the Ethiopia government with respect to EMIS decision- making positions in the region was ineffective. Therefore, considerable attention should be given in bringing up females in leadership positions of the educational levels.

Regarding the age structure, 53.52 % of the respondents were in the age range of 26 to 35 years. About 25.46 % of the respondents aged from 36 to 45 years age range. Of the total respondents, combined together about 78% were in the age range of 26 to 45 years. Therefore, this clearly indicates that majority those who were involved in EMIS activities were at the active working age group.

EMIS is not established for the sake of its own. There must be somebody that uses the data / information generated. For the purposes of building institutional capacity, analyzing the data collected, monitoring the system, and recommending policies, it is desirable that EMIS personnel have advanced formal training and education to work on the positions (MC Mahon, 1993). With this ground, EMIS personnel educational level and work experience need to be considered in assigning for the positions.

**Table 3: Educational Level and Work Experience of Respondents**

Item			Frequency & Percentage				Total	
			School (n=90)		TEB&WEO (n=26)			
			f	%	f	%	f	%
Educational level	Secondary school graduate		14	15.60	-	-	14	7.80
	TTI		08	8.90	-	-	08	4.45
	Diploma		28	31.10	08	30.77	36	30.94
	BA/BSC		40	44.40	17	65.38	57	54.89
	MA/MSC		-	-	1	3.85	01	1.93
	Others		-	-	-	-	-	-
	<b>Total</b>		<b>90</b>	<b>100</b>	<b>26</b>	<b>100</b>	<b>116</b>	<b>100</b>
Work experience	In current position	< 2 years	6	6.67	2	7.69	8	7.18
		2-5 years	37	41.11	21	80.77	58	60.94
		≥ 6 years	47	52.22	3	11.54	50	31.88
		<b>Total</b>	<b>90</b>	<b>100</b>	<b>26</b>	<b>100</b>	<b>116</b>	<b>100</b>
	Total Service	Less than 5	1	1.11	6	23.08	7	12.09
		5-14 years	52	57.78	10	38.46	62	48.12
		15- 25 years	28	31.11	8	30.77	36	30.94
		Above 25	9	10	2	7.69	11	17.69
		<b>Total</b>	<b>90</b>	<b>100</b>	<b>26</b>	<b>100</b>	<b>116</b>	<b>100</b>

As illustrated in Table 3, at school level, by combing about 24.5 % of the respondents of record officers involved in EMIS were below diploma. They were 12<sup>th</sup> grade completers and TTI certificate holders. Personnel with higher educational level assumed to have better capacity of managing and preparing quality data/ information. However, the study implies that record officers assigned from lower educational background. This in turn may affect the processes of information management activity and information production. Hence, the record officers should trained through short and long term trainings to build effective and efficient EMIS unit.

On the other hand, 31.10 % and 44.40 % of school principal respondents were diploma (primary school principals) and degree graduated respectively. Theoretically, they are the main and the higher decision makers at the school levels. Thus, the educational level of principals needs attention because the least requirement for the positions is first degree for complete primary and secondary schools. Training and up-grading to principals promotes the collection of data to be

valuable. The quality of data/ information collected from the schools depends on their accountability and responsibility towards the educational activities performed at the school levels. Therefore, to have accurate, relevant, reliable and timely data/ information at the grass root levels, giving high consideration for the educational level of principals is mandatory.

Additionally, 65.38 % of the WEO and TEB EMIS staff was graduated BA degree. This implies the educational level of TEB and WEO EMIS personnel was to some extent appreciable. However, 30.77 % of the respondents were diploma holders. Therefore, to collect, organize, analyze, store and disseminate information obtained from a number of schools, require high and updated knowledge and technical skills. Hence, providing training is very important for those employees existed below degree level.

Documents concerning work responsibility were analyzed. Thus most of the respondents were not existed at their respective work responsibility positions. Record officers were assigned without considering skills and capacities. Most principals were assigned directly from teachers. At woreda and region levels, most of the EMIS staff personnel were not directly assigned according to the position requirement. Planners and statisticians were assigned from geography and other subjects which are not directly related with EMIS. Therefore, to produce quality data / information placing employers in their appropriate position with respect to the knowledge and the skill needed to the EMIS tasks is critical issue at each level of TEB.

With respect to work experience, the finding reveals that, 41.11 % of school respondents had 2 to 5 years work experience in their current position. It is obvious that EMIS personnel that have worked for several years on the position know what data / information users need. Therefore, from the finding, we can conclude that most of the school respondents were not well experienced. Job related and total years of service has its own positive contribution to any task performance. Hence, matching work experience of principals and record officers with the task requirement should be the priority consideration in selection and recruitment of personnel.

In addition, the finding indicates that 80.77 % of WEO and TEB EMIS personnel had work experience of 5 years and below in their current position. This indicates that at WEO and TEB levels, most of the EMIS personnel were not well experienced in the area. Thus, one can conclude that the experience of WEO and TEB EMIS personnel were not satisfactory. It is clear

that the experiences of EMIS personnel existed in WEO and TEB will determine the quality of data / information collected and distributed to users. Therefore, TEB and WEO should assign well experienced personnel at each level in order to improve the service provided for users and to facilitate the EMIS supply and demand of the Tigray region.

The quality of data determines the demand for users. And it is determined by the outputs provided to users. So, the supplier should be well organized in skilled manpower and technological equipments and materials to provide appreciable service for users. Knowledge and skill of the EMIS personnel to collect, organize, analyze, store and document, and disseminate information will contribute to the improvement of EMIS supply and demand processes. This in turn needs skills to use computers. Therefore, training plays significant role to use computers for data processing and analyzing purposes. Hence, training must be viewed as continuous activity and one that management need to pay high attention to it (Tegegn, 2003).

**Table 4: Responses of Respondents on EMIS related Trainings**

Respondents	Training				The given training was			
	Received		Not received		Satisfactory		Unsatisfactory	
	f	%	f	%	f	%	f	%
School	23	25.56	67	74.44	6	26.09	17	73.91
WEO and TEB	22	84.61	4	15.39	8	36.36	14	63.64
<b>Total</b>	<b>45</b>	<b>38.79</b>	<b>71</b>	<b>61.21</b>	<b>14</b>	<b>36.47</b>	<b>31</b>	<b>63.52</b>

As depicted from Table 4, combined together more than 60 % of the respondents worked on the system have not taken EMIS related trainings. Basically, the problem of lack of training has been observed down to the region educational administrative levels. At school level, 74.44 % respondents were not received EMIS related training and 15.39 % of WEO and TEB respondents were not received too. This implies majority of EMIS personnel found at school level didn't obtain adequate knowledge and skill that assist them to participate actively in production of quality educational information. This situation directly affects the over all activities and products of the education system in general and EMIS unit in specific. Therefore, to address the information need of users and to produce quality data, providing training will be vital.

Regarding the question that request whether the training given was satisfactory or not, combined together, most respondents (63.52 %) were perceived that the training received was inadequate to perform the tasks of EMIS. And the degree of satisfaction with the training was decreased down the educational administration levels. Therefore, designing and providing job related training continuously is very essential to up date the capacities of EMIS personnel found at each level of TEB.

## **4.2 Analysis of Data on Problems and Prospects of EMI Supply and Demand**

The main purpose of EMIS is to provide relevant, reliable, and timely data/ information to various stakeholders for making rational decisions, enhancing planning and programming, monitoring and supporting, policy and strategies reviews within the education system. It is not focus only on collecting processing and distribution data /information. In stead, it should play significant role on providing quality and relevant data for users.

This is the theoretical aspect of EMI supply and demand. Its practice, however, is doubtful. Therefore, the proceeding sections of this analysis part could have responses particularly about EMIS functions performed at different educational levels, information supply and demand, utilization of educational information and problems that hinder functioning of EMI supply and demand.

### **4.2.1 EMIS Functions Performed at Different Educational Levels**

The new education and training policy (ETP) provides due emphasis to decentralized management of the education system (MoE, 2006). And this in turn enables each region to establish their EMIS unit, under this circumstance to collect, analyze and disseminate data/information through various medias including annual education abstracts. However, the existing practical situation does not exist to be in line with such policy. Thus, this section was presented to examine the current practice of EMIS functions performed at the educational levels of Tigray region education system.

#### **4.2.1.1 EMIS Functions Performed at Schools**

At the lower level of educational administration, schools are the main source of educational data/information. They have the responsibility to collect, analyze, document and report educational data/information. Data exist at school level is demanded by various stakeholders for the sake of their interests.

Therefore, the common functions performed at school levels are presented to be rated as: Very low=1, Low=2, Average=3, High=4 and Very high=5. For ease of analysis, the mean values were classified as:  $\leq 2.49$ = Poorly done, 2.5-3.49= Partly done and  $\geq 3.5$  =Mostly done.

**Table 5: Responses of Respondents view on EMIS Functions Performed at School Level (n=90)**

NO	EMIS Functions	Mean	SD
1	Filling AEC Questionnaire	3.50	1.13
2	Collecting data	3.64	1.04
3	Developing school level indicators	2.45	1.19
4	Documenting and storing data	3.07	1.18
5	Dissemination of data/ information	2.37	1.14
6	Reporting timely	3.67	1.04

(SD=Standard Deviation)

As can be seen from the Table 5 above, the most performed EMIS functions, as responded by the school respondents, were filling AEC questionnaires, collecting data and reporting timely to the immediate upper level, which had mean values that range from 3.50 to 3.67. From this, therefore, the status of the schools with respect to the aforementioned EMIS functions could be considered as high. The study, however, shows that developing school level indicators and dissemination of data/ information for users were perceived by the respondents as poorly done and their mean values were 2.45 and 2.37 respectively. This implies the preparation of school level indicators was not performed comprehensively. As well as the dissemination process was not efficiently functioning at school levels.

The computed standard deviation results showed that a rating of the individual respondents was not deviated much when the deviation result was compared among the whole item; again the difference was not significant. Thus, school respondents have the same view on EMIS functions.

Every administrative level needs to have a set of indicators. The list of indicators may differ according to the level concerned (Carrizo and others, 2003). Hence, schools can develop their educational indicators. Developing a good indicator at school level, therefore, makes possible to measure how far objectives achieved relative to predetermined standard and consequently enables to identify challenging situations that existed in the schools. However, from the study, developing school level indicators and dissemination of the information performed poorly. This implies

organizing data (mean=3.42), analyzing data (3.15) and developing indicators (2.92) were reported by the respondents of TEB and WEO as partly done.

However, need identification and analysis, preparation of data collection formats, dissemination of data/ information and providing feedback have mean values ranging from 2.26 to 2.42. They were perceived by the sample respondents as poorly done. Data collected without considering needs of users; preparation of data collection format was not local based; and users have not got information through various dissemination medias. This clearly indicates that the EMIS functions performed at TEB and WEO levels was inefficient to produce relevant, reliable and timely information.

The standard deviation results proved that a rating of the individual respondents was not deviated much when the deviation result was compared among the whole items again the different was not significant. Thus, TEB and WEO respondents have the same opinion on EMIS functions.

In interview, TFEDB, WFEDO and NGO heads and officials respondents replied as no suitable condition was arranged to them to use information. Their need was not considered, the collected data didn't match with their interest and the dissemination mechanism was unsatisfactory. So, they enforced to prepare and collect data by using their formats.

Therefore, to collect and produce quality data, as a result to satisfy the information need of users, making need identification and analysis is vital. Tegegn (2003) verified that knowledge of the needs of planners, decision makers, researchers, and other users is required to develop instrument of data collection. In addition Carrizo and others (2003) and Hua and Herstein (2003) verified the development of data collecting tools must be seriously made by using of specialized personnel. The items, the layout and syntax must be well developed.

Moreover, the dissemination communication takes different forms according to the people they addressed to and their needs. These could be short and synthesized information report, statistical year book on 'paper' and /or electronic support including CD-Rom or internet web-site (Carrizo and others, 2003).

Generally, EMIS functions performed at TEB and WEO were inefficient to produce relevant, reliable and timely information. This clearly indicates that the collection of data was not demand driven and users were not obtained access of information through various information

communication medias. Therefore, Attention should be given for EMIS functions- need identification and analysis, developing data collecting tools, disseminating information through hard copy, soft copy and internet websites. Finally, providing feedback to all contributors found at each level continuously is critical to improve EMIS supply and demand processes of Tigray region.

#### 4.2.1.3 Design of Data Collection Questionnaire

The corner stone of annual data collection is, the 'school census' (Aziz and others, 1990). Commonly, the school data is collected through data collection questionnaire. The instructions of questionnaire should be precise and understandable (Carrizo and others, 2003). Therefore, the design, the instructions, and the terminologies of the AEC questionnaires should be clear to the stakeholders.

This section, therefore, examines the design of data collection questionnaire at TEB and WEO and school levels. Hence to assess the existing practices of the region, the items were rated as: 1= Strongly disagree, 2= Disagree, 3= Undecided, 4=Agree and 5= Strongly agree. For simplicity of analysis, mean values were interpreted as 0.05-1.49= Strongly disagree, 1.5-2.49=Disagree, 2.5-3.49=Undecided, 3.5-4.49=Agree and  $\geq 4.5$ = Strongly agree. To give conclusions, values  $\leq 2.5$  was considered as unfulfilled requirement, average mean values from 2.5 to 3.49 was considered as average level fulfillment and  $\geq 3.5$  considered as fulfilled at high level.

**Table 7: Responses of Respondents View on the Design of Data Collection Questionnaire**

No	Items	TEB&WEO (n=26)	School (n=90)	AvM	SD	t-value
		Mean	Mean			
1	Retain data disaggregated at appropriate level	2.5	2.3	2.43	1.15	0.883
2	Common definition & terminologies	2.4	2.3	2.41	1.21	0.371
3	Mutually exclusive choices	2.4	2.4	2.45	1.05	0.086
4	Clear physical layout	2.3	2.3	2.33	1.21	0.038
5	Matches with school record keeping	2.4	2.3	2.36	1.14	0.480
6	Permit subsequent statistical analysis	2.6	2.2	2.46	1.11	1.583

(AvM= Average Mean, SD=Standard Deviation)

\* Statistical significance at  $\alpha = 0.05$ , two-tailed and  $df = 114$ .

As can be seen from the Table 7 above, all the requirements for design data collection questionnaire were rated the mean values ranging from 2.27 to 2.44 by the school respondents.

Therefore, the school respondents have shown their disagreement on the requirements for design data collection questionnaire.

On the other hand, the WEO and TEB respondents were disagreed on requirements like common definitions and terminologies, provided choices are mutually exclusive, the form has clear physical layout and the design matches with school record keeping. The mean values were rated ranging from 2.34 to 2.46. However, retain data disaggregated at an appropriate level and permit subsequent statistical analysis of data for reliability and validity were the mean values rated by WEO and TEB 2.54 and 2.65 respectively. This implies, the respondents were not decided their degree of agreement. The degrees of respondents' agreement by using the grand mean values were ranging from 2.33 to 2.46. Hence, this implies that the design of AEC questionnaires were not fulfilled all aforementioned requirements.

The computed independent sample t-test at 95% confidence level showed that significance difference in opinion was not observed on responses of the two group respondents at all requirement for the design of data collection questionnaires items. The study indicated that the existed AEC questionnaire did not fulfill almost all the requirements. Hence, the educational data annually collected from schools and woredas was questionable in quality and reliability.

In the open ended question the respondents were asked to provide comment on the design of data collection questionnaire. And they replied the existence of ambiguous concepts, provision of narrow spaces and some contents of the questionnaire are not local based raised as problems.

Document analysis on AEC questionnaire was made. And ambiguous concepts on marital status and students' transfer and provision of inadequate spaces for explaining and putting of figures were analyzed as problems.

Generally, the design of the data collection questionnaire didn't fulfill all the requirements. The implication here is that the design of AEC questionnaire was questionable to collect and produce relevant, reliable and timely data so as to use for effective decision-making purposes. Hence, to have well structured and designed AEC questionnaire, continuous discussion, participation and collaboration with stakeholders and continuous revision on AEC questionnaire is very essential.

## **4.2.2 EMI Demand and Supply**

Information is only having value when there is a use for it. In other words, the value of information depends on the demand for it (Tegegn, 2003). This implies the demand for information is central to the EMIS functions. And the value of the information determined by the demand for it.

Under this topic, different sub-topics like types of educational information demanded at different levels and degree of educational information supply were discussed.

### **4.2.2.1 Types of Educational Information Demanded by TEB, WEO, Schools and Other Organs**

The degree of demand for educational data/ information varies according to the interest of users. Therefore, this section deals with the types of educational information demanded by TEB, WEO, schools and other organs. The items were presented to the sample respondents to rate them as: Very low=1, Low=2, Average=3, High =4 and Very high=5. For ease of analysis, the average mean values were grouped as:  $\leq 2.49$  = Poorly demanded, 2.5-3.49=Partly demanded and  $\geq 3.5$  = Highly demanded.

**Table 8a: Responses of Respondents on Types of Educational Information Demanded by Users Related to Students, Personnel and Teachers**

No	Items	TEB&W EO (n=26)	School (n=90)	AvM	SD	t-value
		Mean	Mean			
	<b><u>Students related information</u></b>					
1	Achievement of students by subject	4.0	4.3	3.97	0.96	-1.435
2	Achievement of students by grade	4.1	4.2	4.15	1.00	-0.462
3	Achievement of students by sex	4.2	3.7	3.95	1.34	1.766
4	Students number by grade	4.5	4.3	4.40	0.77	1.190
5	Students number by sex	4.4	4.4	4.40	0.84	0.000
6	Students number by age	4.2	3.7	3.95	1.14	1.639
7	Repeaters by grade	4.1	4.0	4.05	1.13	0.427
8	Repeaters by sex	4.1	4.1	4.1	1.03	0.000
9	Repeaters by subject	3.9	3.6	3.75	1.30	1.048
10	Drop-out by grade	4.1	3.8	3.70	1.30	1.013
11	Drop-out by sex	4.1	3.8	3.95	1.27	1.079
	<b><u>Personnel and teachers</u></b>	4.1	4.4	4.25	0.88	-1.685
12	Teachers number by subject					
13	Teacher number by qualification	4.1	3.7	3.90	1.19	1.587
14	Teachers number by experience	3.0	3.3	3.15	1.10	-1.327
15	Teachers number by sex	4.1	4.2	4.15	0.98	-0.478
16	Supporting staff by qualification	2.4	2.4	2.4	1.27	0.000
17	Supporting staff by experience	2.7	2.9	2.80	1.08	-0.884
18	Supporting staff by sex	3.0	2.9	2.95	1.05	0.442
19	Teachers performance rating	2.7	3.1	2.90	1.01	-2.010*

( AvM= Average Mean, SD=Standard Deviation)

\* Statistical significance at  $\alpha = 0.05$ , two-tailed and  $df = 114$ .

The Table above depicts that all of the students related information on learning achievement of children by subject, grade and sex, student number by grade, age and sex, repeaters by grade, sex and subject, and drop-out rate by sex and grade was rated the mean values ranging from 3.6 to 4.5 by the respondents. This implies the information highly demanded by the two groups of respondents. This might be demanded for sound decision, planning, controlling, and evaluation of educational activities.

Related to personnel and teachers' information, teachers' number by subjects, qualification and sex, respondents rated the mean values ranging from 3.7 to 4.4. Therefore, this information highly demanded at all levels. This might be demanded for recruiting and upgrading of teachers. On the other hand, teacher number by experience; number of supporting staff by experience and sex, and teacher's performance rating were rated the mean values ranging from 2.7 to 3.3 by the respondents. This implies, the information partly demanded. However, information related to number of supporting staff qualification (mean=2.4) was rated by the two group respondents as poorly demanded. This indicates that due emphasis was not given to knowledge and skills of record officers and other employees who have high contribution to EMIS activities.

**Table 8b: Responses of Respondents on Types of Educational Information Demanded by Users Related to School Space and Environment and Finance and Materials**

No	Items	TEB&WEO	School	AvM	SD	t-value
		(n=26)	(n=90)			
		Mean	Mean			
1	<b>School space &amp; environment</b>					
	Class-size	4.1	4.1	4.10	1.08	0.000
2	School sections	4.0	4.1	4.05	1.01	-0.465
3	<b>Finance and materials</b>					
	Financial resources	3.8	4.1	3.97	1.06	-1.339
4	Utilization of teacher materials	2.7	3.2	2.95	1.23	-2.016*
5	Student text-book	3.8	3.9	3.85	1.15	-0.411

(AvM= Average Mean, SD=Standard Deviation)

\* Statistical significance at  $\alpha = 0.05$ , two-tailed and  $df = 114$ .

Regarding school space and environment related information, both class-size and school sections the mean values were rated ranging from 4.0 to 4.1 by the respondents. This implies the information was highly demanded. Thus, they might be highly demanded for the purposes of fulfilling the standard of teacher-student ratio and as a result to improve the class room management and quality of education.

Concerning finance and materials related information, financial resources and student's text-book mean values were rated 3.8 and above by the two group of respondents. So, they were highly demanded by the two groups. They might be demanded to manage the schools financial resources and to improve students-textbook ratio. However, information on utilization of teaching

materials mean value was rated 2.7 and 3.2 by TEB and WEO and school respondents respectively. This indicates, the information was partly demanded. And it might be relatively highly demanded at school levels for management, planning and monitoring and evaluation functions.

In addition to this, independent t-test was used to see the mean differences at 95% confidence level between TEB and WEO and school respondents. As the computed t-test indicated, there was no significant difference on opinion between the two groups of respondents on most types of educational information demanded by users. However, there was significant difference on demand for teacher's performance rating ( $t=-2.010$ ) and utilization of teaching materials ( $t=-2.016$ ). Thus, the above type of information was significantly needed by schools than TEB and WEO respondents.

In the open ended question, the respondents were asked to specify other information demanded by the schools. Thus, information on good experiences, school garden and number of children who have not got the chance of schooling was demanded by the respondents.

In the interview section, the TEB, TFEDB, WEO, WFEDO and NGO heads and officials were asked to list types of educational information demanded by their organizations, and they replied that information on number of students, teachers, sections, class-size, text-books, references books, completion rate, drop-out rate, repeating rate, educational wastage and co-curricula activities were highly demanded.

Information demanded by different stakeholders in the educational programs would vary according to their roles and responsibilities (MoE, 1999).

Generally, from the study we can conclude that there is high demand for information related to students, teachers, and, school space and environment in the region. However, there was low demand for information on number of supporting staff by qualification. This implies demand for information was incomplete. Thus, undermining the qualification of supporting staff including record officers may be negatively affect the collection and production of quality data for users. Therefore, intensive collecting and using information on qualification of supporting staff needed in Tigray region to develop healthy information production.

#### 4.2.2.2 Educational Information Supply

The main objective of an information system is to supply timely information for managerial decision-making and control. An EMIS, therefore, should generate information for users such as management and administration, research and planning, monitoring and evaluation at all levels of the education system. Hence, all the levels of Tigray region education system are expected to collect and supply the data/ information on the main educational indicators: access, equity, quality, and efficiency.

In order to assess the extent of educational data/ information supply at the levels of the region education system, the items are presented to be rated by the respondents as: Very low=1, Low=2, Average=3, High=4 and Very high=5. For ease of analysis the average mean values are categorized as:  $\leq 2.49$ =poorly supplied,  $2.5-3.49$ =partly supplied,  $\geq 3.5$ =Highly supplied.

**Table 9a: Responses of Respondents on Educational Information Supply Related to Personnel, Teachers and Students**

No	Items	TEB&WEO(n=26)	School(n=90)	AvM	SD	t-value
		Mean	Mean			
	<b><u>Personnel and teacher related</u></b>					
1	Teacher employment transfer	3.19	3.34	3.26	1.08	-0.652
2	Teacher employment turnover	2.15	2.28	2.21	1.17	-0.520
3	Administrative workers transfer	2.38	2.28	2.33	1.16	0.400
4	Administrative workers turnover	2.00	2.31	2.15	1.12	-1.291
5	Teachers' number of subjects	3.73	3.54	3.63	1.03	0.863
6	Teachers' number by qualification	3.46	3.28	3.37	1.07	0.845
7	Teachers' number by experience	3.53	3.64	3.58	1.08	-0.478
8	Teachers' number by sex	3.88	3.63	3.75	1.16	0.972
9	<b><u>Students related</u></b>	3.92	3.72	3.82	0.99	0.921
	Net enrollment rate by grade					
10	Net enrollment rate by gender	4.15	3.64	3.89	1.02	2.318*
11	Gross enrollment rate by grade	4.23	3.69	3.96	0.97	2.596*
12	Gross enrollment rate by gender	4.15	3.61	3.88	0.97	2.621*
13	Students drop-out rate	3.30	3.26	3.28	1.08	0.173
14	Student repetition rate	3.42	3.28	3.35	1.05	0.608
15	Student-teacher ratio by grade	3.57	3.58	3.57	0.99	-0.045
16	Student- text book ratio by grade	3.53	3.59	3.56	1.09	-0.250

(AvM= Average Mean, SD=Standard Deviation)

\* Statistical significance at  $\alpha = 0.05$ , two-tailed and  $df = 114$ .

As shown in the above table, teachers related information like teachers' number by subject (AvM=3.63), experience (AvM=3.58) and sex (AvM=3.75) were rated by the respondents as highly supplied data/ information. In other hand, teachers' employment transfer (AvM=3.26), and teachers' number by qualification (AvM=3.37) perceived by the respondents as partly supplied.

However, information related teachers' employment turn over (AvM=2.21), administrative workers employment transfer (AvM=2.33) and administrative workers employment turnover (AvM=2.15) were rated by the respondents as poorly supplied. The study indicates the supply of information concerning teachers and administrative workers transfer, teachers' number by subject, qualification, experiences and sex was high in the region, but supply of information on teachers' employment turnover and administrative workers employment transfer and turnover was insufficient.

Regarding students related information, information on net enrollment rate by grade (AvM=3.82) and gender (AvM=3.89), gross enrollment rate by grade (AvM=3.96), gender (AvM=3.88), student-teacher ratio by grade (AvM=3.57) and student-textbook ratio by grade (AvM=3.56) perceived by the respondents as highly supplied. This implies the above students' related information supplied sufficiently to users for their management functions.

However, information on students' drop-out rate and students' repetition rate average means were rated as 3.28 and 3.35 respectively by the respondents. They were partly supplied. This clearly indicates the basic students' related information; drop-out and repetition rates were not sufficiently supplied. So, it makes difficult to describe the exact picture of the Tigray region education system related to students' performance.

In the open ended question respondents were asked to describe problems related to data/ information supply, and they replied that information related to students' repetition rate and drop-out rate were inaccurately and incompletely collected and supplied for users. Some schools were inaccurately collected and reported data/information.

**Table 9b: Responses of Respondents on Educational Information Supply Related to Finance and Educational facilities and Materials**

No	Items	TEB&WEO(n=26)	School(n=90)	AvM	SD	t-value
		Mean	Mean			
1	<b>Finance related</b> School annual expenditure budget by type	3.30	3.83	3.56	1.00	-2.488*
2	Annual revenue budget by source	3.26	3.49	3.37	1.00	-1.045
3	Unit cost per student	1.69	1.88	1.78	0.93	-0.926
4	<b>Education facilities &amp; materials</b> Teacher's guide by grade	3.34	3.47	3.40	1.13	-0.520
5	Teacher's guide by subjects	3.34	3.30	3.32	1.15	-0.160
6	Teaching aids by grade	2.42	2.50	2.46	1.05	-0.347
7	Teaching-aids by subjects	2.46	2.28	2.37	1.11	0.818
8	Students' text-books by grade	3.61	3.41	3.51	1.18	0.769
9	Student's text-books by subjects	3.69	3.65	3.67	1.11	0.166
10	Students' desks	3.00	3.66	3.33	1.10	-2.832*

(AvM= Average Mean, SD=Standard Deviation)

\* Statistical significance at  $\alpha = 0.05$ , two-tailed and  $df = 114$ .

Concerning finance related information, information on school annual expenditure budget by type (AvM=3.56) was highly supplied. In other hand, information on annual revenue budget by sources of income (AvM=3.37) was partly supplied. However, information on unit-cost per students (AvM=1.78) was perceived by the respondents as poorly supplied. Therefore, the study reveals that the information on unit-cost per students was insufficiently supplied. Hence, lack of cost data at the education system might be hindering the planning and budgeting, and the equitable distribution of resources in the education system.

On the other hand, with respect to information on educational materials and facilities, supplying of data/ information on student's text-books by grade (AvM=3.51) and subjects (AvM=3.67) rated as high. And information supply on teacher's guide by grade (AvM=3.40), subjects (AvM=3.32) and student's desks (AvM=3.33) rated as partly supplied.

However, information related to teaching-aids by grade (AvM=2.46) and subjects (AvM=2.37) were perceived by the respondents as poorly supplied. Therefore, most of the information related to educational facilities and materials were supplied highly. But, teaching-aids related

information was not supplied adequately. This shows us information related to educational processes was inadequately supplied to users.

Moreover, at 95% confidence level, independent sample t-test was employed to see the mean differences between TEB & WEO and school respondents on degree of educational information supply. The t-test values indicated that there was no significant difference observed on opinions of the two groups of respondents. However, information supply on net enrollment rate by gender ( $t=2.318$ ), gross enrollment rate by grade ( $t=2.596$ ) and by gender ( $t=2.621$ ). Thus, the information was highly supplied by TEB and WEO. This implies there was better preparation of indicators at TEB and WEO than schools. On the other hand, information supply on school annual expenditure budget by type ( $t=-2.488$ ) and student desks ( $t=-2.832$ ) supplied highly by schools than TEB and WEO. This clearly indicates detailed and specific financial and material information was highly supplied at schools. However, it existed rarely and aggregately at TEB and WEO.

Document analysis was made on two consequent TEB produced education statistics abstract of years 2008/9 and 2009/10. Thus, in the 2009/10 abstract, information on Alternative Basic Education (ABE), enrollment on secondary school students by age and re-admission by region were not included. Beside, both of the abstracts were published in the same year (Jan. 2002 and Aug. 2002 respectively). Additionally, inaccurate data was reported on 2009/10 abstract. These were in Adwa woreda, Mai-Tsadik primary school the data reported as number of students (41), number of teachers (39) and number of class (25). Further, on Soloda primary school number of students (76), teachers (32) and class (14). Therefore, one can easily conclude the information produced and disseminated for users was not timely and accurate.

Generally, educational information related to teachers' number by subjects, experience and sex, net enrollment rate by grade and gender, gross enrollment rate by grade, student teacher ratio by grade student-textbook ratio by grade, school annual expenditure budget by type, students' textbooks by grade and subjects were highly supplied. However, information's concerning employee turnover, unit cost and teaching-aids were not sufficiently supplied. In addition to this students' repetition and drop-out rates were inadequately and inaccurately supplied. Thus, the study indicates that important information on employee turnover, unit cost, teaching aids, repetition rate and drop-out rate were insufficiently and imprecisely supplied. That means supply of information

was inadequate and inaccurate in the region. It was very difficult to describe the progress of the region education system with respect to students related outcome indicators. Therefore, attention should be given for supplying of this kind of information adequately and accurately to users to promote information driven sound decision making and to control and evaluate the education system efficiently and effectively consequently to improve quality of the region education.

#### 4.2.3 Utilization of Educational Information

EMIS plays an important role in assisting MoE to formulate strategic policies, develop operational plans and monitor subsequent progress towards predetermined targets (Trucano, 2006). Therefore, information is collected in order to manage and keep the education system in check, for the definition of priorities, planning and formulation of policies, and for monitoring and evaluation purposes.

##### 4.2.3.1 Utilization of Educational Information for Different Purposes

To see the existing practice against this fact, respondents were requested to rate the utilization of educational information at their responsibility levels as: Never =1, Rarely = 2, Sometimes = 3, Usually = 4 and Always = 5. For simplicity of analysis, the average mean values were categorized as:  $\leq 2.49$  = Low utilization, 2.5-3.49 = Average utilization and  $\geq 3.5$  = High utilization.

**Table 10: Responses of Respondents on Utilization of Educational Information**

No	Items	TEB&WEO(n=26)	School(n=90)	AvM	SD	t-value
		Mean	Mean			
1	Sound decision making	3.8	3.8	3.86	0.92	0.000
2	Planning and budgeting	3.8	3.8	3.81	0.95	0.000
3	Evaluating	3.7	3.8	3.81	0.86	-0.555
4	Monitoring	3.8	3.7	3.78	1.04	0.454
5	Enrollment projection	3.8	3.6	3.77	1.09	0.800
6	Policy-making	3.2	2.7	3.01	1.07	2.173*
7	Conducting studies	2.2	2.3	2.32	1.24	-0.370
8	Project development & implementation	2.2	2.3	2.28	1.14	-0.400

(AvM= Average Mean, SD=Standard Deviation,)

\* Statistical significance at  $\alpha = 0.05$ , two-tailed and  $df = 114$ .

As can be seen the table above, educational information for sound decision, planning and budgeting, evaluating, monitoring the on going processes and enrollment projection average mean values were rated above 3.5 by the two group of respondents. Therefore, this implies that there was high utilization of information for aforementioned purposes.

Regarding information utilization for policy making ( $AvM=3.01$ ) was rated as averagely utilized by the two group of respondents. Relatively, at school levels the utilization was low. This implies schools were not utilizing data/information for formulating school level policies so as to improve their teaching-learning activities. Therefore, necessary effort should need to improve it. On the other hand, information utilization for conducting studies ( $AvM=2.32$ ) and project development and implementation ( $AvM=2.28$ ) were rated by TEB and WEO and school respondents. This implies low utilization of information observed in the region for conducting various educational researches and to design and implement educational projects.

The independent t-test at 95% confidence level indicated that the t-calculated values of the items are less than the t-table value (1.990). Thus, this implies there was no significant difference on opinion between the two group groups of respondents. However, there was significant mean difference on policy-making ( $t=2.173$ ) opinion between TEB and WEO and school respondents. This information was relatively highly used at TEB and WEO than at schools. This might be due to lack of skill and awareness to set policies at school level based on the regional and national policies.

In the interview section, the TEB, TFEDB, WEO, WFEDO and NGO respondents were asked for what purposes they have been used educational information; and they described information utilization for controlling the on going processes, to allocate resources such as text-books, desks, teaching-aids, blackboard, chalk, reference books, etc. In addition, the respondents confirmed that utilization of information for planning, to share block-grant for schools, to build schools, additional classrooms and toilet.

In the open ended question, the respondents were asked whether the utilization of information was satisfactory or not and if their answer is not satisfactory to explain the major obstacles. Therefore, most respondents were replied, the utilization was unsatisfactory. They raised problems like lack of technical skills, lack of awareness, lack of commitment, lack accurate data

and fluctuation of data related to students' enrollment, completion, repetition and drop-out rates and shortage of sufficient time.

Generally, utilization of information for conducting studies and, developing and implementing of projects were not satisfactory. Low utilization was observed. This was due to problems on the users themselves and the other problems created due the quality of the collected and the produced information. Therefore, TEB should be support woredas. And woredas in turn should provide technical and materials support to schools. Beside, assigning committed personnel and changing awareness of stakeholders to develop information use culture, providing training regarding development and implementation of projects and conducting studies are the areas to be considered by the region.

#### **4.2.3.2 Data / Information Users**

Parents and teachers, school principals, regional and national officials are the four broad groups of decision makers in education. Each of the group need to monitor the educational activities in order to obtain information that will guide decisions (on a daily, weekly, monthly, or yearly basis) and influence the educational experiences of those in their charge. The types of decisions at each decision-making level will generally be quite different and therefore, the type of information required at each level will also often be quite different (Somerset and Ekholm, 1990).

Therefore, this section was designed to assess data/ information users at different levels of Tigray region education system. The items were presented in the table below to be ranked by sample respondents. For ease of analysis and interpretation, the ranks categorized as: ranks 1-3= high users, ranks 4-6= average users and ranks 7-10= low users.

**Table 11: Rank of the Respondents on Data/ Information Users at Different Levels of EMIS**

Users	Mean scores and ranks				D	D <sup>2</sup>	Weighd mean	Rank
	School (N=90)		WEO &TEB (N=26)					
	Mean	Rank	Mean	Rank				
Woreda education office	4.25	1	4.65	1	0	0	4.34	1
Tigray education Bureau	3.82	2	4.00	2	0	0	3.86	2
Parent-teacher Association	3.62	3	2.38	6	-3	9	3.34	3
Teachers	2.93	4	3.54	3	1	1	3.07	4
Political decision-makers	2.77	5	3.19	4	1	1	2.86	5
Policy –makers	2.70	6	3.19	4	2	4	2.81	6
Parents and communities	2.70	6	1.38	10	-4	16	2.40	7
Other gov. organizations	1.95	8	1.65	9	-1	1	1.88	8
Researchers	1.58	9	1.77	7	2	4	1.62	9
NGOs	1.18	10	1.73	8	2	4	1.30	10

(D=Mean Difference)

Spearman rank order correlation coefficient,  $\Gamma_s$

$$\Gamma_s = 1 - \frac{6 \sum D^2}{n(n^2 - 1)}$$

$$\begin{aligned}
 &= 1 - \frac{6(40)}{10(100-1)} \\
 &= 1 - \frac{240}{990} \\
 &= 1 - 0.24 \\
 &= \underline{0.76}
 \end{aligned}$$

According to the table above, WEO, TEB and PTA were ranked first, second and third respectively by the sample respondents. This implies the data/ information collected from the schools and other levels was highly used by WEO, TEB and PTAS for planning and budgeting, students enrollment projection, monitoring and evaluation, and as a result for sound decision making purposes. On the other hand, teachers, political decision makers and policy-makers were ranked from 4<sup>th</sup> and 5<sup>th</sup> respectively. This indicates that these groups of users partially used the information.

However, parents and communities, other governmental organizations, researchers and NGOs were ranked from 7<sup>th</sup> -10<sup>th</sup>. This implies this group of users considered by the respondents as low information users relative to WEO, TEB and PTAS.

As can be seen from the calculated spearman rank order correlation coefficient, the estimation of the correlation between the two set of ranks is 0.76. It was positive and substantial. This implies there was positive agreement on opinions between the two groups of respondents as well as their agreement on utilization of educational information was considerable. Thus, the utilization of educational information by parents and communities, other governmental organizations, researchers and NGOs to make sound decision, planning, monitoring and evaluation and enrollment projection was poor relative to WEO, TEB and PTAs.

Policy makers, planners, policy-analysts and other clients are the users of data/ information (Hua and Herstein, 2003). Thus, decision makers, policy-makers, researchers, parents and communities, NGOs, and other users that exist at different levels of within and outside the education system should utilize educational data/ information efficiently and effectively to develop the information use culture for sound decisions planning, monitoring and evaluation and as a result to improve EMI supply and demand of Tigray Region.

#### **4.2.3.3 Forms and Dissemination of Educational Information at Different Levels**

One of the most important parts of EMIS is documenting the results of the education system. Effective documentation, therefore, enables to keep all records in a safe place and is easily retrievable when needed. Hand written files, computers files, abstracts, removable disks, indicator reports, type written files, and the like are various data/ information documenting forms. Collecting and documenting of data/ information is meaningless without dissemination. It should be distributed through different mechanisms to address the information need of users. To communicate effectively with users, therefore, using various dissemination medias such as hardcopy, meeting and discussion, soft copy and internet website is very essential.

This section is therefore, developed to assess forms and dissemination medias of educational data/ information at different educational levels of respondents in Tigray. The respondents were asked to rate the items as: Very low=1, Low=2, Average=3, High=4 and Very high=5. For the

simplicity of analysis the average mean values categorized as:  $\leq 2.49$  = Poorly done;  $2.5-3.49$  = Partly done; and  $\geq 3.5$  = Mostly done.

**Table 12: Responses of Respondents on Forms and Dissemination Media for Educational Data/ Information**

No	Items	TEB&WEO(n=26)	School(n=90)	AvM	SD	t-value
		Mean	Mean			
	<b>Forms</b>					
1	Computer files	3.9	2.3	3.14	1.38	6.190*
2	Removable disks (floppy, flash, CD-Rom)	3.7	2.4	3.10	1.30	5.322*
3	Type written paper files	3.2	2.8	3.05	1.17	1.406
4	Hand written paper files	2.5	3.7	3.15	1.23	-5.434*
	<b>Dissemination</b>					
5	Internet web-sites	1.6	1.3	1.47	0.83	1.741
6	Electronically (Soft copy)	2.3	1.8	2.07	1.07	2.304*
7	Hard copy and meetings	4.0	3.8	3.95	0.99	1.095

(AvM= Average Mean, SD=Standard Deviation)

\* Statistical significance at  $\alpha = 0.05$ , two-tailed and  $df = 114$ .

The findings in the above Table show that at different levels of the Tigray education system all the forms used for educational information documentation perceived by the respondents as partly done (average means ranges from 3.05 to 3.15). This indicates that the data / information documentation process of the sample population area was not well developed. It indicates the existence of problems around the area. Specially, at school level except hand written files as can be seen from the mean values relatively the scores were low. The region education bureau should provide pay attention to school level data/ information documentation process.

In the open ended question, respondents were asked to write their opinion on mechanisms to be applied as forms of educational information. So, they pointed out that, especially at school level there was lack of computers, lack of skill and budget constraint.

In other hand, concerning data/ information dissemination media, using hardcopy and conducting meetings (AvM=3.95) were perceived by the respondents as highly done. This indicates that most of the education data/ information of the sample areas were disseminated through hard copies and by conducting meetings with stakeholders. However, internet web-sites (AvM=1.47) and

electronically/soft copy ( $A_{VM}=2.07$ ) were rated as poorly done. This implies at all levels, internet web-sites and soft copy services were inefficiently used. This clearly shows that information users can not get educational information easily through internet websites and soft copy.

The computed independent samples t-test of significance at 95% confidence level showed that significant difference on opinions of the two groups of respondents observed at documenting of information on computer files ( $t=6.190$ ), removable disks ( $t=5.322$ ) and hand written paper files ( $t=-5.434$ ). This indicates computer files and removable floppy disks were better used at TEB and WEO than at schools. Where as schools were highly depended on paper-based documentation system. On the other hand, dissemination of information through soft copy ( $t=2.304$ ) indicates the existence of significant difference between the responses of the two group respondents. This implies electronically media (soft copy) relatively highly used at TEB and WEO. However, schools were highly depended on hard copies and meetings.

In the interview question, the TFEDB, WFEDO and NGOs respondents were asked to list in what forms educational data/information was obtained and most of the respondents replied that it was mainly disseminated in the form of hard copy (monthly, quarterly, mid or annually reports).

Tegegn (2003) pointed publicize product promote the user's chance of receiving the outputs they require. And Carrizo et al (2003) indicated component of dissemination and distribution of information produced by EMIS to user and to general public. The dissemination can be takes place in the form of paper documents (hardcopy), electronic documents (Internet website, CD-ROM).

Generally, the study implies that most of the data/ information documentation formats and the dissemination media in Tigary were highly dominated by the traditional method (i.e. paper based). Dissemination through softcopy and internet web-site was poor. Most schools found in the rural woredas didn't obtain electrical power service. So, there was no ICT access there. Even those schools which have access of computer didn't use it for data processing and disseminating purposes. They were not purposely used it for EMIS purposes. Using various formats for data/ information documentation and establishing highly developed and well equipped ICT infrastructure at all levels of the region education system promote the EMI supply and demand processes to be fruitful. Hence, educational information should be disseminated to the users in appropriate ways and with an appropriate level of aggregation through using of different kinds of

disseminating devices and materials such as paper made (annual abstracts, quick references, short reports, etc) and electronic services (CD-ROM, flash disk, internet website).

#### 4.2.4 Problems that Hinder the EMI Supply and Demand

The existence of human and material resources, in sufficient numbers, and quality are important components to the efficient and effective functioning of EMIS (Carrizo and others, 2003). However, the level of data reliability can be affected by almost all elements of data/ information production procedures. To improve the reliability of data, therefore, the over all design of the data collection questionnaire, data collection process, and design and development of software and database application must be carefully crafted (Hua and Herstein, 2003).

This section is, therefore, designed to examine problems that hinder the proper functioning of EMI supply and demand. Amongst the various that might impede the EMI supply and demand, the major ones were presented to the respondents to be rated as: Not a problem=1, Low problems=2, Medium problem=3, Serious problem=4 and Very serious problem =5. For ease of analysis, the average mean values are classified as:  $\leq 2.49$  = not a problem, 2.5-3.49= Moderately serious problem and  $\geq 3.5$  = Highly serious problems.

**Table 13: Responses of Respondents on Problems that Hinder EMI Supply and Demand**

No	Items	TEB&WEO(n=26)	School(N=90)	AvM	SD	t-value
		Mean	Mean			
<b><u>Problems related to EMI supply</u></b>						
1	Poor design of questionnaire	2.6	4.5	3.57	1.33	-9.500*
2	Poor data collection procedures	2.8	3.5	3.23	1.10	-3.004*
3	Poor data preparation & analysis	3.1	3.3	3.27	0.97	0.952
4	Poor information dissemination	3.0	3.4	3.26	1.12	-1.632
5	Inadequate ICT infrastructure	3.7	3.8	3.82	1.25	-0.362
6	Low technical capacity of personnel	3.5	3.7	3.68	1.24	-0.475
<b><u>Problems related EMI demand</u></b>						
7	Lack of awareness	3.3	3.6	3.51	1.07	-1.234
8	Poor information culture	3.1	3.5	3.32	1.10	-1.666
9	Low initiation	3.2	3.6	3.44	1.08	-1.694
10	Lack of skills	3.3	3.7	3.55	1.13	-1.612
11	Absence of conducive environment	3.6	3.6	3.6	1.17	0.000

(AvM=Average Mean, SD=Standard Deviation)

\* Statistical significance at  $\alpha= 0.05$ , two-tailed and  $df= 114$ .

In the interview section respondents of TEB, TFEDB, WEO, WFEDO and NGOs heads and representatives were asked to give their opinion on major problems related to EMI supply and demand. They replied as lack of ICT infrastructure, poor software design, lack of technical skill, poor information culture, lack of commitment and lack of awareness highly observed in Tigray region.

On the other hand, interviewees were asked to mention strategies that help to improve EMI supply and demand, and they explained that training and skill up-grading of EMIS personnel, adequate budget allocation, good governance, effective and maximum use of ICT, strong record keeping, developing well-organized EMIS unit, shared vision, strong coordination and leadership, and developing culture of information use are identified as main strategies to improve EMI supply and demand. Thus, the TEB and other concerning governmental and non-governmental organizations and institutions including MoE should provide their substantial support to improve and develop EMI supply and demand in Tigray region.

Training seminars for EMIS personnel should be organized in parallel with the setting up and the development of EMIS. And the training should be periodically renewed (Carrizo and others 2003). Therefore, to enhance the effectiveness and efficiency of EMI supply and demand, organizational development and capacity building activities play a pivotal role.

Moreover, development of ICT infrastructure, database and software permit larger volumes of more divers data to be collected from a growing number of sources (both with in and outside of the education sector) and managed more easily (Hua and Herstein, 2003).

Generally, the study reveals that the EMI supply and demand of the region was highly problematic. The problems were mainly related with the capacities of EMIS personnel and institutional capacity to collect, analyze and disseminate educational information to internal and external users for making sound decision. The problems increased as we go down to the region education system. Lack of skilled EMIS personnel and deficiency of technological materials and equipments, lack of initiation, lack of awareness to use information and lack of a culture of information use highly observed at the lower levels of the education system. So, TEB in collaboration with MoE and other educational levels as well as NGOs should provide trainings (short and long term), equip with ICT materials, allocate sufficient budget, create awareness and improve all activities of EMIS in order to tackle the problems that hinder EMI supply and demand of the region.

## CHAPTER FIVE

### 5. Summary, Conclusion, and Recommendation

This chapter deals with summary of the findings, conclusion drawn from the findings, and recommendations forwarded.

#### 5.1 Summary

The main objective of the study was to assess the practice of education management information supply and demand in Tigray region. Based on the objective, literature was reviewed from various references. To achieve the stated objective and examine the problems encountered in EMI supply and demand, the following basic questions were raised:

1. To what extent do the EMIS functions performed efficient in producing of timely, relevant and reliable data and information?
2. What are the major education data and information demanded by users and supplied to users?
3. To what extent do educational data and information used for management, planning and, monitoring and evaluation of the system of education?
4. What are the major problems that hinder the proper functioning of EMIS to address the demand for users?

Descriptive survey method was employed to carry out the research. The data were collected using questionnaire, interview and document analysis. School principals, record officers, WEO and TEB EMIS personnel, TEB, TFEDB, NGO (Action Aid Ethiopia and REST), WEO and WFEDO heads and officials were the primary sources of the data. Annual Education Statistics Abstract, the ACE questionnaire, periodic statistical reports and employee profile documents were the secondary sources.

The study was conducted in 3 zones, 12 woredas, 36 complete primary and 12 general secondary government schools. The study areas were selected based on stratified random sampling techniques. The sample respondents were selected by using of purposive sampling technique. The intended samples for the questionnaire were 4 TEB EMIS personnel, 24 WEO EMIS personnel, 48 school principals and 48 record officers. 124 copies of questionnaires were distributed based on the predetermined proportion. Of these questionnaires, therefore, 116 (93.55%) of the

questionnaires were returned after being filled. However, 8 (6.45%) questionnaires were not returned.

On the other hand, semi-structured interview was conducted with one TEB, one TFEDB, two NGOs (Action Aid Ethiopia and REST), ten WEO and six WFEDO heads and officials.

Analysis of the data was made using descriptive statistical techniques. The specific statistical techniques used for analysis include: frequency distribution, percentage, mean, average mean, and weighted mean and standard deviation. And to check the significant mean differences of opinions of respondents, independent samples t-test and Spearman rank order correlation coefficient were used. Based on the analysis, the following major findings were obtained.

### **5.1.1 Characteristics of Respondents**

- a) Most of the respondents were males (76.41%). Only 23.59% of the respondents were females.
- b) Regarding the age structure, above 75 % of the respondents were in the age range of 26 to 45 years
- c) The educational level of 44.4 % school respondents and 65.38 % WEO and TEB respondent were BA degree. However, 24.5 % of the school respondents (record officers) were below diploma level.
- d) In current position, 55.22 % of the school respondents were above 5 years work experience. However, 80.77% of TEB&WEO respondents were below 6 years work experience.
- e) With respect to EMIS related training 84.61 % of TEB&WEO respondents were received the training. However 63.64% of the respondents (those received the training) were not satisfied by the given training. On the other hand, 25.56 % of school respondent were received the training. However, of these respondents 73.91% were not satisfied. Beside, 74.44% of the school respondents were not received training related to EMIS.

## 5.1.2 Problems and Prospects of EMI Supply and Demand

### 5.1.2.1 EMIS Functions Performed to Produce Relevant, Reliable and Timely Data/Information

- a) The school respondents rated the most common EMIS functions like filling AEC questionnaire, collecting data and reporting timely because the mean values were above 3.5. Documenting and storing (mean=3.07) rated as partly done. However, developing school level indicators (mean=2.45) and dissemination (mean=2.37) rated as poorly done.
- b) Regarding TEB&WEO respondents EMIS functions such as collecting educational data from immediate lower levels, documenting and storing, and reporting timely perceived as mostly done because the mean values were above 3.5. On the other hand, organizing data (mean = 3.42) analyzing (mean=3.15) data and developing indicators (mean=2.92) reported as partly done. However, EMIS functions like need identification and analysis (mean=2.42), preparation of data collection format (mean=2.42), dissemination (mean=2.42) and providing feedback (mean=2.26) rated as poorly done.
- c) All of the design of data collection questionnaire, retain data disaggregated at an appropriate level, common definitions and terminologies, provided choices are mutually exclusive, clear physical layout form, the design matches with school record keeping and permit subsequent statistical analysis requirements were not accepted by the respondents because the average mean values were below 2.5. Hence, the design of data collection questionnaire was not fulfilled all the requirements.

### 5.1.2.2 Major Educational Information Demanded and Supplied

- a) Student related information on learning achievement of children (by subject, grade and sex), students' number (by grade, sex and age), repeaters (by grade, sex and subject) and drop-out (by grade and sex) were rated the average mean values above 3.5. Thus, this information was highly demanded by all levels of respondents.
- b) Personnel and teacher related information on teachers' number (by subject, qualification and sex) were highly demanded ( $AvM \geq 3.5$ ). On the other hand, information on teachers' number by experience, number of supporting staff (by experience and sex), and teachers' performance rating information were partly demanded by all levels of respondents ( $AvM$

- scores ranging between 2.5 and 3.49). However, number of supporting staff by qualification (AvM=2.42) was poorly demanded.
- c) School space and environment related information on class-size and school section were highly demanded by all of the respondents because the average mean values were above 3.5.
  - d) Finance and material related information on financial resources and student's text-book were highly demanded because the average mean values were above 3.5. However, information on utilization of teaching materials (AvM=2.95) rated as partly demanded by respondents.
  - e) Personnel and teacher related information on teachers' number by subjects (AvM=3.63), by experience (AvM=3.58) and by sex (AvM=3.75) were reported as highly supplied to users at all levels. On the other hand, information on teachers transfer (AvM=3.26) and teachers' number by qualification (AvM=3.37) were perceived as partly supplied to users. However, information on administrative workers transfer (AvM=2.33) and teachers and administrative workers turnover (AvM=2.21 and 2.15 respectively) were rated as poorly supplied to users at all levels.
  - f) Student related information on net enrollment rate by grade (AvM=3.82) and by gender (AvM=3.89), gross enrollment rate by grade (AvM=3.96) and by gender (AvM=3.88), students-teacher ratio by grade (AvM=3.57) and students-textbook ratio by grade (AvM=3.56) were reported as highly supplied to users. On the other hand, information on students' drop out rate (AvM=3.28) student repetition rate (AvM=3.35) was partly supplied to users.
  - g) Finance related information on school annual expenditure budget by type (AvM=3.56) was highly supplied to users. Information on annual revenue budget by sources of income was partly supplied to users. However, information on unit cost per student (AvM=1.78) poorly supplied to users.
  - h) Educational facilities and materials related information on students' text-book by grade (AvM=3.51) and by subject (AvM=3.67) were highly supplied to users. Information on teachers' guide by grade (AvM=3.40) and by subjects (AvM=3.32) and students' desk (AvM=3.33) were partly supplied to users. However, teaching-aids by grades

environment to use information ( $AvM=3.6$ ) were rated as highly serious problems. On the other hand, poor information culture on part of users ( $AvM=3.32$ ) and low initiation to use information ( $AvM=3.44$ ) were identified by the respondents as moderately serious problems.

- c) By considering the mean values of EMI supply and demand, the problems were more serious at school levels than at WEO and TEB.

To sum up, the following are the key problems identified in the study that hindered the EMI supply and demand of Tigray region. Among these are: EMIS functions of need identification and analysis, preparation of data collection format, developing school level indicators, dissemination and providing feedback were poorly performed in the region. Besides, information on administrative workers qualification was poorly demanded by users. Moreover, information on administrative workers transfer and turn-over, teachers' turn-over, unit-cost and teaching aids were poorly supplied to users. Furthermore, low utilization of information was observed on conducting studies and project development and implementation. Parents, communities, other governmental organizations, researchers and NGOs were low information users. In addition, internet web-sites and soft copies were poorly utilized to disseminate information. Overall, the Region EMI supply and demand functions experienced highly serious problems of inadequate ICT infrastructure, low technical capacity, lack of awareness on importance of information and lack of skills to use information.

However, the region had some good opportunities to develop EMI supply and demand. Among these were under the decentralized educational administration, the establishment of EMIS unit in the region promotes the collection of adequate, reliable and timely data/information from woredas and schools. In the ESDP action plan monitoring, evaluation and reviewing responsibilities were given to the region. Therefore, these conditions enable to establish and implement EMIS effectively and efficiently. Besides, the Tigray Region Education Bureau administrates a number of educational experts, EMIS personnel, school principals, administrative workers, teachers and students. Thus, effectively organizing and participating these manpower help to develop EMIS of Tigray region to collect and provide quality educational information to users. Moreover, the expansion of ICT infrastructure and woreda net and the existence of

universities, NGOs and other donor agencies also play a pivotal role in the development of EMI supply and demand in Tigray region.

## **5.2 Conclusion**

The main purpose of EMIS is to provide relevant, reliable and timely data/information to various stakeholders for making rational decisions, planning, and monitoring and evaluation purposes. However, the EMIS functions performed in Tigray region can be described as poor in terms of information need identification and analysis, designing and preparation of data collection format, dissemination and providing feedback. In addition the supply of and demand for information was inadequate and unsatisfactory.

The utilization of information was highly limited to internal users (WEOs, TEB and PTAs) Conducive environment was not created for external users (other governmental organizations, NGOs and researchers). Information utilization for conducting studies and project development was poor. At schools, information was mainly documented through paper files. Documentation on computer files and removable disks was hardly used or totally not used. Dissemination through internet web-sites ignored in the region. Moreover, the system has experienced highly serious problems associated with inadequate ICT infrastructure, low technical capacities of EMIS personnel, lack of awareness and skills to use information.

Therefore, in light of these findings, it could be concluded that the EMI supply and demand functions were inefficient to provide EMIS outputs it tends to serve for the education system of Tigray region. In contrary, the education system of the region increased in terms of number of students, teachers, administrative workers, and number of schools. This in turn makes the EMI supply and demand of the region to be expanded and complicated. In addition, the region has designed and implemented educational strategies to achieve the regional, national and international goals. Consequently, this needs accurate, relevant, reliable and timely data for effective management, planning, monitoring and evaluation purposes. However, the deficiencies of EMI supply and demand activities affect the region efforts to achieve the expected regional, national and international priority areas.

## 5.3 Recommendations

Based on the findings, the researcher recommended the following:

### 1. Improving Efficiency of EMIS Functions

- a) Decisions about the content of educational data/information need to be made only after a comprehensive analysis of the information requirements of users. However, the finding indicates as it was poorly performed at the region education system. The needs of pertinent decision-makers and other potential users were not identified. To solve the problem, therefore, TEB, WEOs and schools should conduct studies on needs identification and analysis and making continuous discussion with stakeholders as the primarily task of EMIS is very critical.
- b) The annual school census is conducted through AEC questionnaires because it is the corner stone to collect quality data/information from schools. Thus, the design should precise and clear for stakeholders. However, the design of AEC Questionnaire was poor in terms of clear definition and terminologies, mutually exclusive choices, physical layout, retain data disaggregated at an appropriate level, matches with school recordkeeping and permit subsequent statistical analysis. To produce relevant, reliable and timely data as well as to improve the performance of EMIS, TEB should develop the data collection instruments by considering aforementioned requirements. Beside, there should be an active involvement of stakeholders and development partners in construction of data collection instruments.
- c) Indicators allow monitoring and evaluating educational plans or policies. Developing relevant and reliable indicators determine the quality of EMIS. However, construction of indicators was not performed efficiently at schools. Therefore, to have effective and efficient EMIS unit and to see clearly the overall activities of schools, developing quality indicators is very essential. Training and support to schools from WEO and TEB experts is highly needed. So, TEB and WEO should develop indicators preparation and utilization capacities of school principals through short and/or long term trainings, preparing and distribution of guide manuals and creating experience sharing mechanisms can the methods to be used to improve it.
- d) Documentation of data/ information should not only to be paper based files. Since, they can be lost, faded or damaged easily. To have effective and efficient documentation,

therefore, using various documentation methods like computer files, flash disks, floppy disks, and CD- Rom are indispensable in education systems. However, documentation through computers and removable disks at schools was very poor. It was mainly documented on paper files. Therefore, TEB and WEO should provide technical, financial and material support to schools to develop their data /information documentation system.

- e) Dissemination data/ information through paper based materials (Annual education statistics abstract and other reports) are not adequate to address the information needs of users. Therefore, EMIS should use multiple data/ information disseminating medias such as internet Web-sites, removable disks (floppy and flash) and CD-ROM at each level. However, dissemination in Tigray education system was poor. Information mainly disseminated through hard copies (papers). Internet web-sites were not functional in the region. To make the information accessible to users therefore, TEB, WEO and schools should use various mechanisms-internet web-sites, removable disks (floppy and flash) and CD-ROM to disseminate information to users. This can be achieved through collaborating TEB with stakeholders, NGOs and development partners which are working in the area of education.
- f) Provision of feedback was poor in the region EMIS. TEB should effectively and efficiently provide feedback to woredas and woredas in turn to schools to ensure continuous learning and enhancement. This can be achieved by conducting discussion with stakeholders, distributing circulars, develop motivating mechanisms and working together with MoE. NGOs and development partners.

## **2. Developing EMI Supply and Demand**

- a) The information supply on teacher's turnover, administrative workers turnover and transfer, unit cost of students and teaching aids was poor. In addition, information on drop-out rate and repetition rate was not completely supplied. Thus, the types of information provided for users were inadequate. Therefore, TEB, WEO and schools should create mechanisms to provide different kinds of information by considering the interest of users. To realize this EMIS of the region together with WEO and schools should identify information needs of users by conducting studies, discussions, etc.

- b) Demand-driven supply of information is very important for EMIS success. However, demand for information on number of supporting staff by qualification was poor. Hence, it was incomplete. Therefore, TEB, WEO and schools should create opportunities to develop the demand of users for educational information. These are possible through developing awareness of stakeholders through conducting conferences, workshops and medias for effective demand for educational information.

### **3. Improving utilization of information**

- a) A supply of data is not adequate to ensure meaningful data use. Local utilization for better data is critical to successful development. However, utilization of information on part of users was not appreciable. The information utilization of parents and communities, other governmental organizations, NGOs and researchers was poor. To create effective utilization of information on the part of users, therefore, TEB, WEO and schools should motivate stakeholders to aware of the utility of information and establishing of opportunities for stakeholders to use information. Developing of skills of stakeholders through conferences, workshops and various kinds of medias is essential for developing EMIS outputs utilization.
- b) Utilization of information was limited to decision-making, planning and budgeting, monitoring and evaluation, and enrollment projection. However, information utilization for conducting studies and project development and implementation was poor. Therefore, TEB, WEO and schools should develop capacities of information users existed at different educational levels of Tigray region for conducting studies and project development and implementation. To realize this, developing skills of information users for conducting studies and project development and implementation through workshops, conferences, trainings (short and/or long term), preparation and distribution of manuals are very essential. And collaboration with Moe, NGOs and development partners can facilitate its practicality.

#### **4. Building the Capacity of EMIS Personnel**

- a) Considerable knowledge and skills are required to build, maintain and use an EMIS. Basic technical skills are needed to mount and manage EMIS that provide useful inputs to decision-making at the various levels of the education system. At each level lack of trained personnel and lack of well experienced personnel are highly observed. Training must be taken as the component of EMIS. The value of education system, the information need of users and technological advancement are changing fast. Accordingly, to produce quality, complete and timely data, therefore, assigning knowledgeable and skilled personnel is needed. Thus, training must be viewed as a continuous activity, and one that TEB and WEO management to pay attention. The EMIS personnel found at each level have to be trained continuously on issues of data collection questionnaire preparation, data collection, verification, analysis, documentation, dissemination and utilization. Besides, computer and internet utilization capacity building mechanisms should be created working together with Ministry of Science and Technology, universities, NGOS and donor agencies.
- b) Field of specialization was not considered during assigning of EMIS personnel mainly at schools and woredas. ‘Any diploma’ or ‘any degree’ highly used for assigning of personnel. However, this condition highly affects the production of quality and timely data. Thus, to improve the over all activities and products of EMI supply and demand of Tigray region, consideration must be given for filed of specialization at each level of Tigray education. TEB and WEO should assigned EMIS personnel based on field of specialization directly related with the EMIS positions. The field of specialization should be related to educational planning and management, computer science, IT and statistics.

#### **5. Establishing Strategies to Improve EMI Supply and Demand**

Demand-driven supply of data promotes the utilization of EMIS outputs on part of users. However, problems like inadequate ICT infrastructures, low technical capacity of EMIS personnel, and lack of awareness and lack of skill to use information were highly serious problems in Tigray region. To alleviate the problems, therefore, establishing strategies to improve EMI supply and demand are vital. TEB should establish strategies like training and skill up grading of EMIS personnel through giving short or long term trainings about EMIS,

developing incentive structures by improving salary, adequate budget allocation, good governance through developing conducive working environment, software and database development by providing computer trainings, effective and maximum use of ICT by computerizing the EMIS unit, clear recordkeeping, developing well-organized EMIS unit through equipping with materials and skilled personnel, consistent political commitment and support through developing good willing, shared vision by setting clear plan, strong coordination and leadership by strengthen management of EMIS unit, and developing culture of information use through conferences, seminars and workshops to improve EMI supply and demand activities particularly at schools and woredas of Tigray region. These can be achieved through collaborating with stakeholders, universities, NGOs and donor agencies.

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1.4 School level:

- a. Grades 1-4  e. Grades 9-12   
b. Grade 5-8  f. Grades 1-12   
c. Grades 1-8  g. If any other, please specify \_\_\_\_\_  
d. Grades 9-10

1.5 Work responsibility

- a. Record officer  b. School principals   
c. If other, please specify \_\_\_\_\_

1.6 Education qualification:

- a. Secondary school graduate  d. BA/BSC   
b. TTI certificate  e. MA/MSc   
c. TVET/ college diploma  f. If other, please specify \_\_\_\_\_

1.7 Job experience:

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

In other position \_\_\_\_\_

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

1.8 Have you taken any training related to EMIS?

- a. Yes  b. No

1.9 If your answer to question number '8' is 'yes', the training is

- a. Satisfactory  b. Unsatisfactory

1.10 Would you list down areas in which you have taken trainings?

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**Part II. Functions of EMIS**

**2.1 The design of data collection questionnaire**

In your opinion what are the requirements related to data collection questionnaire.

Indicate the degree of your agreement or disagreement by the numbers: 5= Strongly agree,

4= Agree, 3=Undecided, 2=Disagree, 1=Strongly disagree

No	Forms and Dissemination of Educational Information	Rating scale				
		5	4	3	2	1
2.3.1	<u>Forms of Educational information</u> computer files					
	Removable disks (floppy, flash, CD-ROM)					
	Type written paper files					
	Hand written paper files					
2.3.2	<u>Dissemination of Education Information through</u> Web-Pages					
	Electronically (Soft copy)					
	Hard copy and meetings (Staff, PTA & Others)					

2.3.3 If any other form, please specify here \_\_\_\_\_

\_\_\_\_\_

2.3.4 What mechanisms should be applied to organize and disseminate  
of educational information?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Part III- EMI Need and supply**

**3.1 Types of educational information needed by school**

In your opinion to what extent the following list of information are needed at school and system of education? Rate as 5= Very high, 4= High, 3= Average, 2= Low, 1=Very low

No	Types of Educational Information Needed	Rating scale				
		5	4	3	2	1
	<u>Student related information</u>					
	Information on learning achievement of children by subject					
	Information on learning achievement of children by grade					
	Information on learning achievement of children by sex					
	Information on student numbers by grade					
	Information on student numbers sex					
	Information on student numbers age					
	Information on repeaters by grade					
	Information on repeaters by sex					
	Information on repeaters by subjects					
	Information on students drop-out by grade					
	Information on drop-out by sex					
3.1.2	<u>Personnel and teachers related information</u>					
	Information on teachers numbers by subjects					
	Information on teachers numbers by qualification					
	Information on teachers numbers by experience					
	Information on teachers numbers by sex					
	Information on numbers of supporting staff by qualification					
	Information on numbers of supporting staff by experience					
	Information on numbers of supporting staff by sex					
	Information on teacher's performance rating					
3.1.3	<u>School space and environment related information</u>					
	Information on class size					
	Information on school sections					
3.1.4	<u>Finance and Materials related information</u>					
	Information on financial resources					
	Information on utilization of teaching materials					
	Information on student text-book					

3.1.5 If any other, please specify here

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3.2. Degree of Educational Information supply

To what extent the following information are available in your school? Put in its degree of availability. Rate as: 5= Very high, 4= High, 3= Average, 2= Low, 1=Very low

No	Available data/ information	Degree of availability				
		5	4	3	2	1
3.2.1	<u>Personnel and teacher</u>					
	Teacher employment transfer					
	Teacher employment turnover					
	Administrative workers employment transfer					
	Administrative workers employment turnover					
	Teachers number by subjects					
	Teachers number by qualification					
	Teachers number by experience					
Teachers number by sex						
3.2.2	<u>Students</u>					
	Net enrollment rate by grade					
	Net enrollment rate by gender					
	Gross enrollment rate by grade					
	Gross enrollment rate by gender					
	Student drop-out rate					
	Student repetition rate					
	Student- teacher ratio by grade					
Student- text book ratio by grade						
3.2.3	<u>Finance</u>					
	School annual expenditure budget by type					
	Annual revenue budget by sources of income					
	Unit cost per student					
3.2.4	<u>Educational Facilities and materials</u>					
	Teacher's guide by grade					
	Teacher's guide by subjects					
	Teaching-aids by grade					
	Teaching-aids by subjects					
	Students' text-book by grade					
	Students' text-book by subjects					
Students' desk						

3.2.5 If any other, please specify here \_\_\_\_\_

3.2.6 In your opinion what are the reasons for the unavailability of some educational information in your school? \_\_\_\_\_

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**Part IV. Utilization of Educational Information**

4.1 Utilization of education information for different purposes at school level

To what extent the following educational information are demanded/ used in school?

Please rate them as:

5= Always, 4= Usually, 3= Sometimes, 2=Rarely, 1=Never

No	Purposes for which educational information demanded for	Rating scale				
		5	4	3	2	1
4.1.1	Sound decision- making					
4.1.2	School level planning and budgeting					
4.1.3	Evaluating the functioning of the school					
4.1.4	Monitoring the ongoing processes of the school					
4.1.5	Enrollment projection					
4.1.6	Educational policy-making					
4.1.7	Conducting studies					
4.1.8	Project development and implementation					

4.1.9 If any other, please specify here \_\_\_\_\_

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4.1.10 Is demand for information satisfactory? If not, please indicate the major problems

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4.2 Data / Information users

Who uses the data / information generated by EMIS? Rank them

No	Body that uses of data / information	Rank
4.2.1	Woreda Education office (WEO)	
4.2.2	Parent-teacher association (PTA)	
4.2.3	Political decision- makers	
4.2.4	Policy –makers	
4.2.5	Regional Education Bureau (REB)	
4.2.6	Teachers	
4.2.7	NGOs	
4.2.8	Other governmental organizations	
4.2.9	Parents and communities	
4.2.10	Researchers	

**Part V Problems that Hinders Functioning of EMIS**

5.1 Listed below are problems that hinder the proper functioning of EMIS. Indicate the extent of seriousness as they occur in your school. Rate them as: 5= Very serious, 4= Serious, 3= Moderate, 2= Less serious, 1=not a problem

No	Problems	Rating scale				
		5	4	3	2	1
5.1.1	<u>Problems related to EMI supply</u>					
	Poor design of data collection questionnaire					
	Poor data collection procedures					
	Poor data preparation and analysis techniques					
	Poor information dissemination					
	Inadequate ICT infrastructure					
5.1.2	<u>Problems related to EMI demand</u>					
	Lack of awareness on the importance of information					
	Poor information using culture on the part of users					
	Low initiation to use information					
	Lack of skill to use information					
	Absence of conducive environment to use information					

5.1.3 If any other, specify \_\_\_\_\_

5.1.4 If you have any comment on problems related to EMI supply and demand please specify \_\_\_\_\_

**Part VI- General Comments**

If you have any general comment, on EMI supply and demand in your school, please specify

\_\_\_\_\_

\_\_\_\_\_

Thank you again!

## Appendix C

Addis Ababa University

College of Education

Department of Educational Planning and Management

Questionnaire to be filled by WEO and TEB EMIS Staff

### General direction

A dear respondent, this questionnaire is aimed to solicit data for a research entitled “problems and Prospects of EMI supply and demand in Tigray Region.” Your thoughtful response to the questions is sought to be a great help to the success of the research.

Therefore, I kindly request your cooperation by frankly and honestly responding to the items contained in the questionnaire. The information is intended purely for academic research purpose and will be kept confidential. Hence, your participation by giving genuine and truthful information is highly appreciated.

Thank you in advance for your cooperation!

5. No need of writing your name
6. please put “X” mark in the box provided where alternatives are given
7. For any additional response or different opinion please write it on the space provided
8. Your timely response will contribute to the value of the research.

**N.B** The acronyms and terms used in questionnaire stand for

**AEC-** Annual Education Census

**EMI-** Education Management Information

**EMIS-** Education Management Information System

### **Part I. General Information**

1.1 Zone \_\_\_\_\_ Woreda \_\_\_\_\_

1.2 Sex: a. Male  b. Female

1.3 Age: a. 25 and less  b. 26-35  c. 36-45  d. Above 45

1.4 Work responsibility

a. Planner  b. Statistician

c. If other, please specify \_\_\_\_\_

1.5 Education qualification:

d. Secondary school graduate  d. BA/BSC

e. TTI certificate  e. MA/MSc

f. TVET/ college diploma  f. If other, please specify \_\_\_\_\_

1.6 Job experience:

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

In other position \_\_\_\_\_

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

1.7 Have you taken any training related to EMIS?

a. Yes  b. No

1.8 If your answer to question number '8' is 'yes', the training is

a. Satisfactory  b. Unsatisfactory

1.9 Would you list down areas in which you have taken trainings?

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**Part II. Functions of EMIS**

**2.1 The design of data collection questionnaire**

In your opinion what are the requirements related to data collection questionnaire. Indicate the degree of your agreement or disagreement by the numbers: 5= Strongly agree, 4= Agree, 3=Undecided, 2=Disagree, 1=Strongly disagree

No	Requirement	Agreement degree				
		5	4	3	2	1
2.1.1	Retain data disaggregated at an appropriate level					
2.1.2	Common definitions and terminologies					
2.1.3	provided choices are mutually exclusive					
2.1.4	The form has clear physical layout					
2.1.5	The design matches with school record keeping					
2.1.6	Permit subsequent statistical analysis of data for reliability and validity					

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

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2.2 EMIS Functions at woreda and TEB levels

The following are functions in the production of education information. Which ones are performed? Please rate them as:

5= Very high, 4= High, 3= Average, 2= Low, 1=Very low

No	Functions	Performance degree				
		5	4	3	2	1
2.2.1	Developing of data collecting format					
2.2.2	Collecting educational data from schools					
2.2.3	Compiling data / information					
2.2.4	Analyzing data					
2.2.5	Developing indicators					
2.2.6	Documenting and storing data					
2.2.7	Dissemination of data					
2.2.8	Reporting timely					

2.2.9 If others, please specify \_\_\_\_\_

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2.2.10 What strategies should be taken to upgrade EMIS functions at woreda level

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2.3 Forms and Dissemination of educational information's

To what extent educational information used, supplied to upper levels and other organs are organized and disseminated? Rate them as:

5= Very high, 4= High, 3= Average, 2= Low, 1=Very low

No	Forms and Dissemination of Educational Information	Rating scale				
		5	4	3	2	1
2.3.1	<u>Forms of Educational information</u> computer files					
	Removable disks (floppy, flash, CD-ROM)					
	Type written paper files					
	Hand written paper files					
2.3.2	<u>Dissemination of Education Information through Web-</u> <u>Pages</u>					
	Electronically (Soft copy)					
	Hard copy and meetings (Staff, PTA & Others)					

2.3.3 If any other forms, please specify here \_\_\_\_\_

\_\_\_\_\_

2.3.4 What mechanisms should be applied to organize and disseminate  
of educational information?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

### Part III- EMI Need and supply

#### 3.1 Types of educational information needed

In your opinion to what extent the following list of information are needed at system of education? Rate as 5= Very high, 4= High, 3= Average, 2= Low, 1=Very low

No	Types of Educational Information Needed	Rating scale				
		5	4	3	2	1
	<u>Student related information</u>					
	Information on learning achievement of children by subject					
	Information on learning achievement of children by grade					
	Information on learning achievement of children by sex					
	Information on student numbers grade					
	Information on student numbers sex					
	Information on student numbers age					
	Information on repeaters by grade					
	Information on repeaters by subjects					
	Information on repeaters by sex					
	Information on students drop-out by grade					
	Information on drop-out by sex					
3.1.2	<u>Personnel and teachers related information</u>					
	Information on teachers numbers by subjects					
	Information on teachers numbers by qualification					
	Information on teachers numbers by experience					
	Information on teachers numbers by sex					
	Information on numbers of supporting staff by qualification					
	Information on numbers of supporting staff by experience					
	Information on numbers of supporting staff by sex					
	Information on teacher's performance rating					
3.1.3	<u>School space and environment related information</u>					
	Information on class size					
	Information on school sections					
3.1.4	<u>Finance and Materials related information</u>					
	Information on financial resources					
	Information on utilization of teaching materials					
	Information on student text-book					

3.1.5 If any other, please specify here

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3.2. Degree of Educational Information supply

To what extent the following information is supply? Put in its degree of availability. Rate as: 5= Very high, 4= High, 3= Average, 2= Low, 1=Very low

No	Available data/ information	Degree of availability				
		5	4	3	2	1
3.2.1	<b><u>Personnel and teacher</u></b>					
	Teacher employment transfer					
	Teacher employment turnover					
	Administrative workers employment transfer					
	Administrative workers employment turnover					
	Teachers number by subjects					
	Teachers number by qualification					
	Teachers number by experience					
Teachers number by sex						
3.2.2	<b><u>Students</u></b>					
	Net enrollment rate by grade					
	Net enrollment rate by gender					
	Gross enrollment rate by grade					
	Gross enrollment rate by gender					
	Student drop-out rate					
	Student repetition rate					
	Student- teacher ratio by grade					
	Student- teacher ratio by gender					
	Student- text book ratio by grade					
Student- text book ratio by gender						
3.2.3	<b><u>Finance</u></b>					
	School annual expenditure budget by type					
	Annual revenue budget by sources of income					
	Unit cost per student					
3.2.4	<b><u>Educational Facilities and materials</u></b>					
	Teacher's guide by grade					
	Teacher's guide by subjects					
	Teaching-aids by grade					
	Teaching-aids by subjects					
	Students' text-book by grade					
	Students' text-book by subjects					
Students' desk						

3.2.5 If any other, please specify here \_\_\_\_\_

3.2.6 In your opinion what are the reasons for the unavailability of some educational information?

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**Part IV. Utilization of Educational Information**

4.1 Utilization of education information at woreda and TEB levels

To what extent the following educational information are demanded/ used? Please rate them as:

5= Always, 4= Usually, 3= Sometimes, 2=Rarely, 1=Never

No	Purposes for which educational information demanded for	Rating scale				
		5	4	3	2	1
4.1.1	Sound decision- making					
4.1.2	School level planning and budgeting					
4.1.3	Evaluating the functioning of the school					
4.1.4	Monitoring the ongoing processes of the school					
4.1.5	Enrollment projection					
4.1.6	Educational policy-making					
4.1.7	Conducting studies					
4.1.8	Project development and implementation					

4.1.9 If any other, please specify here \_\_\_\_\_

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4.1.10 Is demand for information satisfactory? If not, please indicate the major problems

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4.2 Data / Information users

Who uses the data / information generated by EMIS? Rank them

No	Body that uses of data / information	Rank
4.2.1	Woreda Education office (WEO)	
4.2.2	Parent-teacher association (PTA)	
4.2.3	Political decision- makers	
4.2.4	Policy –makers	
4.2.5	Regional Education Bureau (REB)	
4.2.6	Teachers	
4.2.7	NGOs	
4.2.8	Other governmental organizations	
4.2.9	Parents and communities	
4.2.10	Researchers	

**Part V Problems that Hinders Functioning of EMIS**

5.1 Listed below are problems that hinder the proper functioning of EMIS. Indicate the extent of seriousness as they occur. Rate them as: 5= Very serious, 4= Serious, 3= Moderate, 2= Less serious, 1=not a problem

No	Problems	Rating scale				
		5	4	3	2	1
5.1.1	Problems related to EMI supply					
	Poor design of data collection questionnaire					
	Poor data collection procedures					
	Poor data preparation and analysis techniques					
	Poor information dissemination					
	Inadequate ICT infrastructure					
5.1.2	Low technical capacity of EMIS staff					
	Problems related to EMI demand					
	Lack of awareness on the importance of information					
	Poor information using culture on the part of users					
	Low initiation to use information					
	Lack of skill to use information					
	Absence of conducive environment to use information					

5.1.3 If any other, specify \_\_\_\_\_

5.1.4 if you have any comment on problems related to EMI supply and demand please specify \_\_\_\_\_

**Part VI- General Comments**

If you have any general comment, on EMI supply and demand, please specify

\_\_\_\_\_

\_\_\_\_\_

Thank you again!

## **Appendix D**

**Addis Ababa University**

**College of Education**

**Department of Educational Planning and Management**

**Interview questions for Region Finance and Economics Development Bureau**

**(RFEDB) head, WFEDO heads and NGOs heads**

Dear interviewee, this interview is aimed to solicit data for a research entitled “problems and Prospects of EMI supply and demand in Tigray Region.” Your thoughtful response to the questions is sought to be a great help to the success of the research.

Therefore, I kindly request your cooperation by frankly and honestly responding to the items contained in the interview. The information is intended purely for academic research purpose and will be kept confidential. Hence, your participation by giving genuine and truthful information is highly appreciated.

Thank you in advance for your cooperation!

1. Does your organization collect educational information from schools?
2. What kind of data you need for your purposes?
3. Do your region EMIS outputs satisfy the demand for users?
4. How information suppliers determine the information needs of users?
5. Is the data/ information released adequate, reliable and timely?
6. Is the data/ information disseminated comprehensive and satisfactory?
7. In what format do you obtain data / information?
8. What problems have you encountered while you demand for information?
9. What strategies should be taken to improve EMI supply and demand in the region?

Thank you again!

## Declaration

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

Name Getnet Berhanu

Signature 

Institution Addis Ababa University

Date of Submission 1/06/2011