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**EDUCATION NEEDS ASSESSMENT FOR MEKELLE CITY, ETHIOPIA**

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NB: This needs assessment was initially researched and prepared by Jessica Lopez. It was revised and updated by MCI Social Sector Research Manager Mourié Maoulidi who also ran the EPSSIm model simulations and wrote the introduction and the conclusion and recommendations section and revised the EPPSIm results section. MCI intern Michelle Reddy assisted in reviewing and updating the report. The report also benefitted from input provided by MCI Social Sector Specialist in Ethiopia, Aberash Abay.

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### Ethiopian Ministry of Education

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## **LIST OF ACRONYMS AND ABBREVIATIONS**

ART	Anti-Retroviral Treatment
CPD	Continuous Professional Development
ECE	Early Childhood Education
EFA	Education for All
EMIS	Education Management Information Systems
ESDP	Education Sector Development Program
FPE	Free Primary Education
GDP	Gross Domestic Product
GER	Gross Enrollment Rate
GPI	Gender Parity Index
ICT	Information Communication Technology
MDG	Millennium Development Goals
MOE	Ministry of Education
NER	Net Enrollment Rate
NGO	Non-government Organization
OSSA	Organization of Social Services for AIDS
SBR	Student - Textbook Ratio
SIP	School Improvement Program
SSR	Student - Section Ratio
STR	Student - Teacher Ratio
TVET	Technical, Vocational Education and Training
UN	United Nations
UNDP	United Nations Development Program
UNESCO	United Nations Educational, Scientific and Cultural Organization

## **EXECUTIVE SUMMARY**

This study provides an overview of the education system in Mekelle, Ethiopia, and assesses prospects for achieving education-related Millennium Development Goals (MDGs), specifically ensuring universal primary education (MDG 2), and gender parity (MDG3) by 2015.

Mekelle is on its way toward achieving universal primary education, by 2015; however improvements in educational quality are needed. This includes upgrading and increasing teacher training, providing students with teaching materials, increasing classroom and school construction, increasing toilet facilities and linking curricula to labor market. Concerning MDG 3, gender parity has been achieved at the primary level, and Mekelle is on target to achieve this goal by 2015 at the secondary level. Yet promoting gender parity through public programs and campaigns, providing sufficient private toilet facilities for girls and increasing the number of female teachers are necessary.

The paper uses quantitative data obtained from education officials in Mekelle and the capital of Ethiopia, Addis Ababa, as well as qualitative data collected in interviews with teachers, non-government organizations (NGOs) and government officials to identify the major education challenges and resources required to address these challenges.

Section I of this report provides a description of the methodology used in conducting the needs assessment and an overview of the education system in Ethiopia and Mekelle. Section II assesses challenges in various subsectors of the education system. Section III uses UNESCO's Education Policy and Strategy Simulation (EPSSim) model to simulate certain scenarios and cost estimates for achieving MDGs 2 and 3. Section IV summarizes conclusions and present recommendations.

# I. INTRODUCTION

## 1.1 Background

Mekelle<sup>1</sup> is the sixth largest city in Ethiopia. Located in northern part of the country, it was established as an urban centre in 1869-1873 and is the capital of Tigray region. Since its establishment, the city has expanded tremendously by engulfing many small villages and towns. In 2005 (1997 E.C.),<sup>2</sup> the city covered an area of 28 square kilometers. In 2006, the areas known as Quiha (also Qwiha or Kuha) and Aynalem were incorporated within Mekelle City. As a result, present day Mekelle City covers an area of 109.36 square kilometers (BOFED, 2009).

Mekelle is both a city and a *woreda*.<sup>3</sup> According to the latest Ethiopian Census, the city's population in 2007 (2000 E.C.) was 215,546. The city's projected population in 2008 was 227,505.<sup>4</sup> Mekelle is one of northern Ethiopia's primary economic and educational centers, housing Mekelle University, a leading higher education institution in Ethiopia. The main economic activities include agro-processing (in particular, vegetables and oil seeds), and the city also offers investment opportunities in manufacturing, livestock and tourism.

Mekelle is also a city with one of the highest poverty rates in Ethiopia (Gebremedhin, 2006; Gebremedhin and Whelen, 2007), in part because it is located in a region that has suffered from recurrent drought over the past three decades (Gebremedhin and Whelen, 2007). In 1994, it is estimated that 55.1 percent of the people lived below the poverty line of 79.36 birr (\$8.35) per month (Gebremedhin and Whelen, 2007). However, between 1995 and 2000, poverty rates in Mekelle began declining, mainly due to reconstruction and an influx of investment capital (Gebremedhin, 2006). In 2000, 33.3 percent of the people in Mekelle lived below the poverty line of 92.95 birr (\$9.78) per month (Gebremedhin and Whelen, 2007).

## 1.2 Objectives

The objectives of this needs assessment are to evaluate the major education challenges in Mekelle and to assess the city's prospects for achieving the education Millennium Development Goals (MDGs) by 2015. Specifically, the MDGs in education are to achieve universal primary education (MDG 2) and to attain gender parity for girls at all education levels (MDG 3) by 2015.

## 1.3 Methodology

This needs assessment mainly relies on quantitative data obtained from education officials in Mekelle and the capital city of Addis Ababa, but also uses qualitative data collected in interviews with teachers, NGOs and education government officials. Data were collected between June and August 2008. Quantitative data were obtained with the assistance of Mr. Ato Gebremedihnn,

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<sup>1</sup> The city of Mekelle is also referred to as Mek'elle or Mek'ele.

<sup>2</sup> E.C. refers to the Ethiopian Calendar, which is used throughout the country and which runs eight years behind the generally used Roman calendar. In this report, "E.C." always denotes those dates given in the Ethiopian Calendar.

<sup>3</sup> A *woreda* is a political subdivision (similar to a district) within a region of Ethiopia. There are 35 *woredas* in Tigray and Mekelle is one of them.

<sup>4</sup> This population was projected using data from the 2007 census, an exponential growth function and an average growth rate of 5.4 percent.



Head of Statistics at the Tigray Regional Education Bureau and Mr. Ato Kahsu of the Mekelle City Education Office. The interviews conducted by the researcher ranged from one to three hours in duration and provided insights on challenges in the education sector and what needs to be done to address them.<sup>5</sup>

The needs assessment uses an Excel-based tool developed by UNESCO, known as the Education Policy and Strategy Simulation (or EPSSIM), to project student enrollments, determine staffing and facility requirements and estimate financial resource requirements.

#### **1.4 Limitations**

The interviews with government and education officials were useful. However, because of their positions, some officials were unable to fully disclose their ideas and opinions. Representatives of non-government organizations were able to be more forthcoming.

Another limitation was that schools were on summer break during the six weeks when the research was conducted. It was nevertheless possible to visit several schools in order to assess the condition of the facilities. In addition, many teachers spend their summer break at the headquarters the Tigray Teachers Association, which made it was possible to interview several teachers representing different grades at Mekelle public schools.

#### **1.5 Overview of Education in Ethiopia and in Mekelle**

The education system in Ethiopia consists of eight years of primary education (divided into two four-year cycles) and two years of lower secondary education (Grades 9-10). After completing lower secondary school, a student can attend two years of higher secondary education or pursue technical and vocational education and training (TVET).

In 1997, the government launched a series of plans designed to expand access to education and improve educational quality, relevance, efficiency and equity. The third plan, ESDP III (2005-2010), is designed to meet these goals as well as the MDGs in education. ESDP III documents the progress made during ESDP I and II and outlines strategies for attaining the MDGs by 2015. It identifies the following goals:

- To increase access to educational opportunities at the primary level, and to achieve universal primary education by the year 2015;
- To improve the quality of education;
- To narrow the enrollment gap between male and female students;
- To reduce adult illiteracy by enhancing access to adult and non-formal education;
- To increase access to secondary education.

Ethiopia has made efforts to facilitate decentralization at the school level through the establishment of Regional Education Bureaus. Decentralization aims to empower local communities to take responsibility for determining their education priorities and to improve the quality of service delivery.

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<sup>5</sup> A list of the individuals interviewed is in Appendix 2.

Table 1 shows the numbers of schools at each level in Mekelle in 2008 and 2009. It can be seen that the number of public and private schools is growing.

**Table 1. Number of Schools, Mekelle 2008 & 2009**

School Type	2008			2009		
	Government School	Non Government Schools	Total	Government School	Non Government Schools	Total
Pre-School/Kindergarten	1	49	50	1	52	53
Elementary First Cycle (1-4)	9	6	15	10	5	15
Elementary Schools (1-8)	21	11	32	22	12	34
Special Education	2	-	2	2		2
Elementary and High school (	1	9	10		13	13
Secondary School (9-12)	4	1	5	5	1	6
Preparatory School (11-12)	1	-	1	1		1
<b>Total</b>	<b>39</b>	<b>76</b>	<b>115</b>	<b>41</b>	<b>83</b>	<b>124</b>

Source: 2008 data is from Mekelle City Administration, 2009 Data is from Mekelle City Education Office

This needs assessment focuses on primary and secondary education in Mekelle. Pre-primary education, technical and vocational training (TVET), special education and adult education are discussed, but due to time and data limitations, this study does not include estimates of the costs of providing these services. The World Bank encountered similar constraints in its comprehensive study of education in Ethiopia (World Bank, 2005). It should also be noted that some schools operate on a shift system (i.e. there is a morning and an afternoon session), but this study does not distinguish between such schools and those that do not operate on a shift system.

## II. PERSPECTIVES ON EDUCATION SUB-SECTORS

### 2.1 Pre-Primary Education

Pre-primary schools enroll children between the ages of four and six. According to the ESDP III, the demand for pre-primary schooling has been increasing in recent years. However, pre-primary education is still mostly provided by private sector. The government is committed to developing this sub-sector but the focus has been on encouraging private sector and international agencies to provide this service (ESDP III, 2005).

In 2006, there were 39 pre-primary schools, with 4,252 students, in 2007, there were 50 pre-primary schools with an enrollment of 5,020 students, and in 2009 there were 53 pre-primary schools with 5796.<sup>6</sup> Despite these steady increases, many pre-school-age children in Mekelle do not enroll in school, in large measure because there are not enough schools to meet the demand but also because of prohibitive tuition fees

Since 2008, UNICEF, the Child to Child Trust, and the MOE have launched a program known as Child to Child (CtC) in Tigray and Oromiya. This initiative is a low-cost alternative to institutional preschools. It involves blending learning with playtime. Young facilitators

<sup>6</sup> Data provided by the Tigray Education Abstract, MCI Social Sector Specialist in Tigray, and Mekelle City Education Office

(children in grades 5-6) work with children aged five to six years old for one to two hours a week to prepare the preschool-aged children for their first year of primary school. Each facilitator is responsible for 5 children and they are provided with a manual to guide learning activities. Currently, the CtC program is only operating in rural areas in Tigray and Oromiya. UNICEF plans to start a pilot project in Addis Ababa in 2010 and MCI is lobbying the Tigray Regional Office to UNICEF to launch a similar project in Mekelle.

## 2.2 Primary Education

Primary schooling in Ethiopia consists of grades 1-8. The sequence is divided into two cycles: basic education (grades 1-4) and general education (grades 5-8). The goal of primary education is to prepare students for secondary education or for technical and vocational training. Four core subjects are taught in grades 1-4, six in grades 5-8. The main subjects taught for grades 1-4 are: Tigrinya (the language of Tigray), English, math and science. In grades 5-8, two core subjects are added: Amharic, the national language of Ethiopia, and social sciences. A national examination is administered at the end of grade 8; students who pass the national exam are awarded certificates. Additionally, some primary schools operate on a shift system. Classes in schools operating on a shift system are 40 minutes long, whereas classes in regular schools are 45 minutes long.

Table 2 illustrates that the GER and NER for Mekelle, the Tigray region and the whole country in 2007. It can be seen that in Mekelle, the GER was 130.7 percent for boys and 152.81 percent for girls, while in Tigray, the GER was 104.29 percent for boys and 103.8 percent for girls.<sup>7</sup> The national GER was 107 percent for boys and 94 percent for girls.

**Table 2. GER and NER for Primary Schools at Local, Regional and National Levels 2007**

	GER: males	GER: females	GER: both sexes	NER: males	NER: females	NER: both sexes
Mekelle City	130.70%	152.81%	141.17%	97.11%	114.38%	105.29%
Tigray Region	104.29%	103.8%	104.05%	89.07%	91.98%	90.51%
Ethiopia	107%	94%	100%	71%	66%	68%

Source: Tigray Region Education Bureau (2007) and EFA GMR (2008).

The official starting age for primary schooling is seven years old, but few students enter school at this age. In addition, the fact that gross enrollment rates are above 100 percent indicates that there are over-age students in primary schools. In 2007, there were 56 primary schools in Mekelle (33 public, 23 private), enrolling 51,450 students, of which about 51 percent were female. On average one primary school served 918 students. In 2008, primary schools enrolled a total of 50,537 students, a slight decrease from the 2007 enrolment figures.

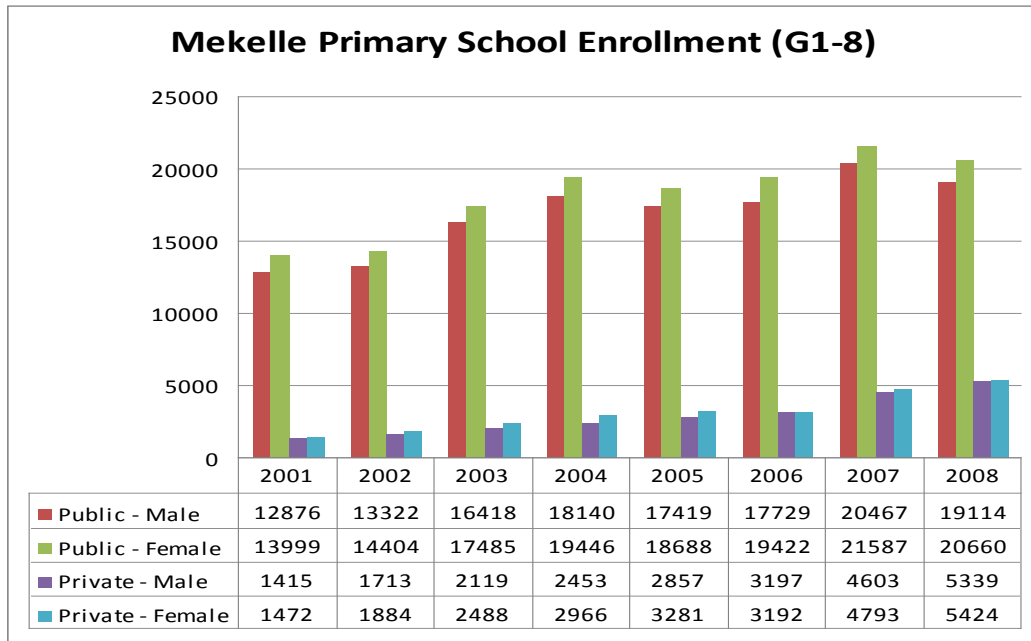
Figure 1 shows enrollment in Mekelle City from 2001-2008, disaggregated by gender and by type of school. The graph illustrates that enrollment in public primary schools has increased

<sup>7</sup> The GER is the number of students enrolled in primary school, regardless of age, expressed as percentage of the population in relevant official age group. It is generally used to show the general level of participation in a given level of education.

every year, except for a slight decrease from 2004 to 2005. Enrollment in private primary schools increased steadily over the 2001-2008 period.

Figure 1 also illustrates that in both public and private schools, more girls enrolled in primary school than boys, indicating that Mekelle is accomplishing the goal of improving gender parity at the primary school level.

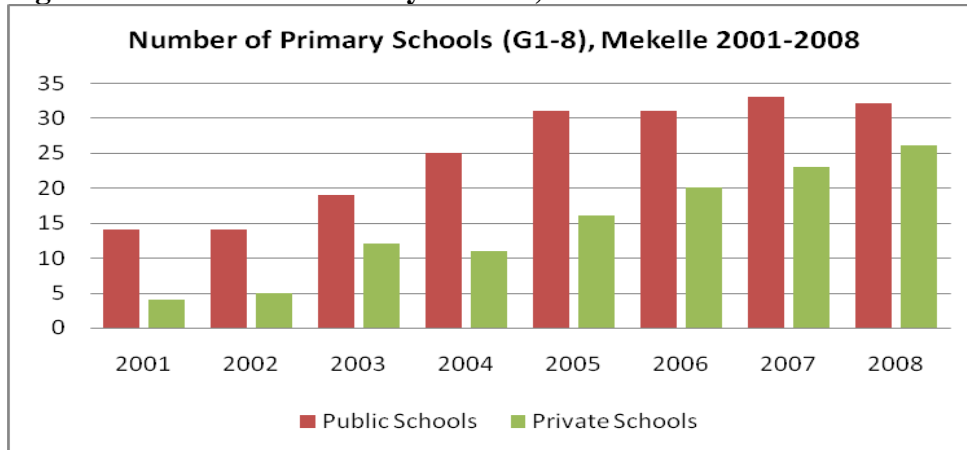
**Figure 1. Enrollment, Primary Schools, Mekelle 2001-2008**



Source: Tigray Regional Education Bureau Office of Statistics, 2008

*Primary school buildings and infrastructure:* To keep up with the increased demand for primary schooling, several schools have been built and rehabilitated. Between 2001 and 2008, the number of primary schools in Mekelle increased steadily. Figure 2 shows the number of primary schools in Mekelle from 2001-2008, with public schools outnumbering private schools.

**Figure 2. Number of Primary Schools, Mekelle 2001-2008**



Source: Tigray Regional Education Bureau Office of Statistics, 2008

The availability of latrines is a major infrastructure issue in the primary schools. Table 3 illustrates the total number of toilets, the number of schools without toilets, and the number of schools with separate toilets for girls and boys. Regarding government primary schools, where the total enrollment is 42,054 and the total number of toilets is 96, the ratio of students per toilet is 438:1, an alarming number. Approximately half the public primary schools (16 out of 33) in Mekelle lack latrines. Finally, of 17 schools with latrines, only ten have separate toilets for girls and boys. In addition, many of the latrines had not been cleaned since construction, rendering them filthy and unusable.<sup>8</sup> More latrines need to be constructed, as well as urinals for boys.

**Table 3. Number of Latrines, Primary School, Mekelle 2007**

	Public	Private
Total Schools	33	23
Total Toilets	96	135
Schools without Toilets	16	5
Schools with Unisex Toilets	7	0
Schools with Separate Toilets	10	18

Source: Tigray Region Education Bureau: Education Statistics Annual Abstract 2008

Another major infrastructure concern is access to water. Of the 33 public primary schools, 21 had either a tap or well water source in 2007, and 12 had no available water source (Tigray Region Education Bureau, 2008). However, the figures do not indicate that while schools had water taps, they were often broken, and many had not been functional for many months. This suggests that as schools are built, there is a need to ensure that there is access to water and sufficient latrines are built and properly maintained.

**Table 4. Primary Schools with and without a Water Source, Mekelle 2007**

	Public	Private
Total Schools	33	23
Schools with Water (Tap or Well)	21	20
Schools with No Water Source	12	3

Source: Tigray Region Education Bureau: Education Statistics Annual Abstract 2008

Students contribute 1-2 birr per year towards salary of janitors. The rest comes from national and local governments. There are usually 1-2 janitors per school, and each one is paid approximately 75 birr per month (\$6.25 per month).<sup>9</sup>

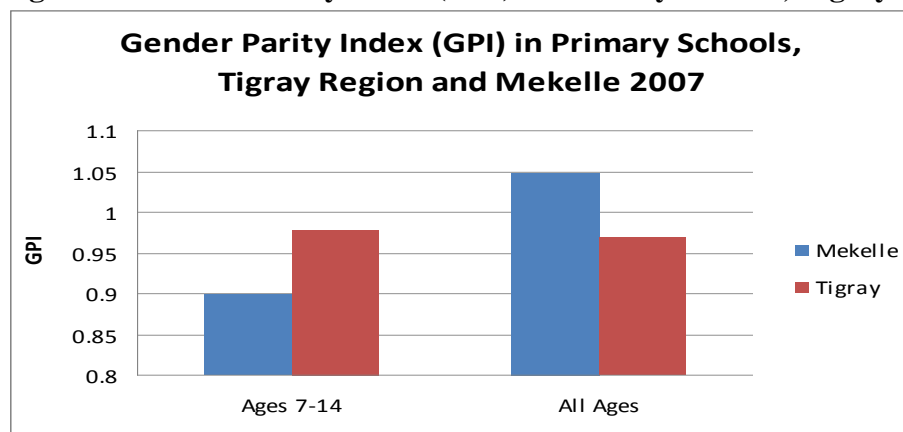
*Gender parity in primary schools:* progress has been made in increasing girls' enrollment in primary schools. The gender parity index (GPI) for Mekelle was 0.90 for the primary school age

<sup>8</sup> Since MCI's research was completed, 30 new latrines and 36 water points have been built. The total cost was 3 million birr. The Office of International Cooperation, of Israel's Ministry of Foreign Affairs (MASHAV) contributed 273,000 birr and the remaining costs were covered by Mekelle education, health and water offices.

<sup>9</sup> Information provided by the head of the Mekelle Education Office, Ato Kasu Adane, August 1, 2009. Exchange rate is \$1 = 12 birr.

population (ages 7-14) in 2006.<sup>10</sup> This indicates that Mekelle City is well-positioned to attain gender parity in primary schools by 2015.

**Figure 3. Gender Parity Index (GPI) in Primary Schools, Tigray Region and Mekelle 2007**



Source: Tigray Region Education Bureau: Education Statistics Annual Abstract 2008

It is worth noting that schools in Mekelle have high drop-out rates for both girls and boys in the first grade. As a result of these high drop-out rates, survival rates are low and many children do not attain functional literacy and numeracy. After grade 1, the drop-out rate for both sexes then tapers off and remains fairly low (0-2 percent) until grade 8, increasing to ten percent for girls and only 1.5 percent for boys (See Table 5). ESDP III (2005) notes that available research findings indicate that the causes for dropping out are mostly socio-economic. Some examples of the factors that contribute to the girls' drop-out rate in 8<sup>th</sup> grade include increased responsibility at home and pregnancy.

Tables 5 shows the flow rates of primary school students in 2007 (1999 E.C.), including promotion, repetition and dropout rates. It can be seen that drop out rates were quite high in the first grade.

**Table 5. Primary School Students (1-8) Flow Rates, Mekelle, 2007 (1999 E.C.)**

	Grades								Total
	1	2	3	4	5	6	7	8	
<b>Boys</b>									
<b>Promotion rate</b>	0.7841	0.9530	0.9218	0.9590	0.9233	0.9137	0.9453	0.8626	0.9078
<b>Repetition rate</b>	0.0251	0.0157	0.0308	0.0521	0.0636	0.0441	0.0854	0.1221	0.0549
<b>Dropout rate</b>	0.1908	0.0314	0.0474	-0.0111	0.0131	0.0422	-0.0306	0.0153	0.0373
<b>Girls</b>									
<b>Promotion rate</b>	0.8089	0.9730	0.9552	1.0277	0.9536	0.9722	1.0669	0.8165	0.9468
<b>Repetition rate</b>	0.0184	0.0196	0.0371	0.0394	0.0720	0.0521	0.0824	0.0834	0.0505
<b>Dropout rate</b>	0.1728	0.0075	0.0077	-0.0671	-0.0256	-0.0243	-0.1494	0.1000	0.0027

Source: Tigray Region Education Bureau: Office of Statistics, 2008

<sup>10</sup> The GPI is a quotient of the number of females by the number of males enrolled in a given stage of education (primary, secondary, etc.). A value close to one indicates that parity has been more or less achieved. A value that is much less than 1 one indicates differences in favor of boys

Boys had a higher overall dropout rate (0.0373), with the exception of the Grade 8 dropout rate, which is significantly higher for girls. Continuous performance evaluation of students who need help can help reduce the drop out rates.

Significant progress has been made to improve access to education in recent years but more attention needs to be accorded to improving the quality of education. This includes increasing the number of trained teachers, reducing student/teacher ratios and providing learning materials.

Table 6 shows the number of trained teachers in both the public and private primary schools in 2007. The majority of teachers in public primary school, 92 percent, were trained, while only 38 percent of private primary school teachers were trained.

**Table 6. Number of Trained and Non-Trained Teachers, Primary Schools, Mekelle 2007**

	<b>Public</b>	<b>Private</b>
<b>Trained</b>	763	138
<b>Non-Trained</b>	64	224
<b>Total</b>	827	362

Source: Tigray Regional Education Bureau Office of Statistics, 2008

*Student-teacher ratio:* The 2008 average student to teacher ratio was 1:50 in public primary schools and 1:33 in private ones, indicating a need to reduce the student-teacher ratio in public primary schools, to improve the quality of attention to students and of their education.

### **2.3 Secondary Education**

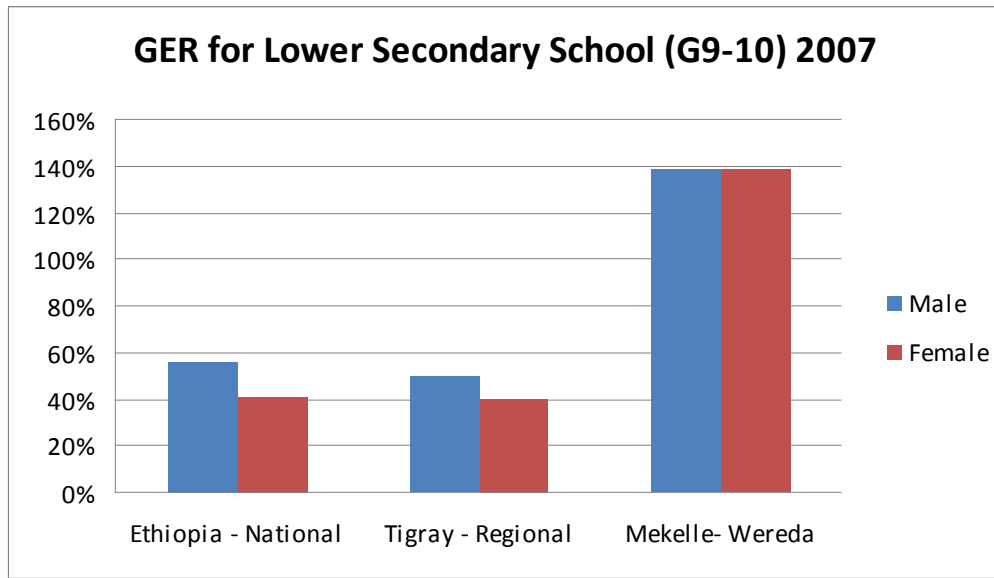
Secondary education lasts four years and is divided into two 2-year cycles. The first 2-year cycle is known as lower secondary school (grades 9 and 10), while the second cycle is referred to as upper secondary school (grades 11 and 12). National examinations are administered at the end of grades 8, 10 and 12. A student's performance on the grade 10 exam determines whether she will proceed to upper secondary school.

If a student fails the grade 10 exam and wants to continue her education, she must study on her own and wait for the following year to retake the exam. If a student passes but receives a low mark, he is eligible to apply for a technical and vocational training school (TVET). Lastly, if a student gets high marks on the grade 10 exam, he is eligible to continue his studies in upper secondary school.

*Enrollment:* In 2008, there were 15 secondary schools, of which five were public and 10 were private, serving 15,411 students. Eighty-five percent of secondary school students were enrolled in the public schools. Additionally, in 2008, private schools enrolled 2,352 students, yielding an average enrollment of 235 students per school. Public schools enrolled 13,059 students, for an average enrollment of 1,306 students per school, indicating most Mekelle students attended public secondary school.

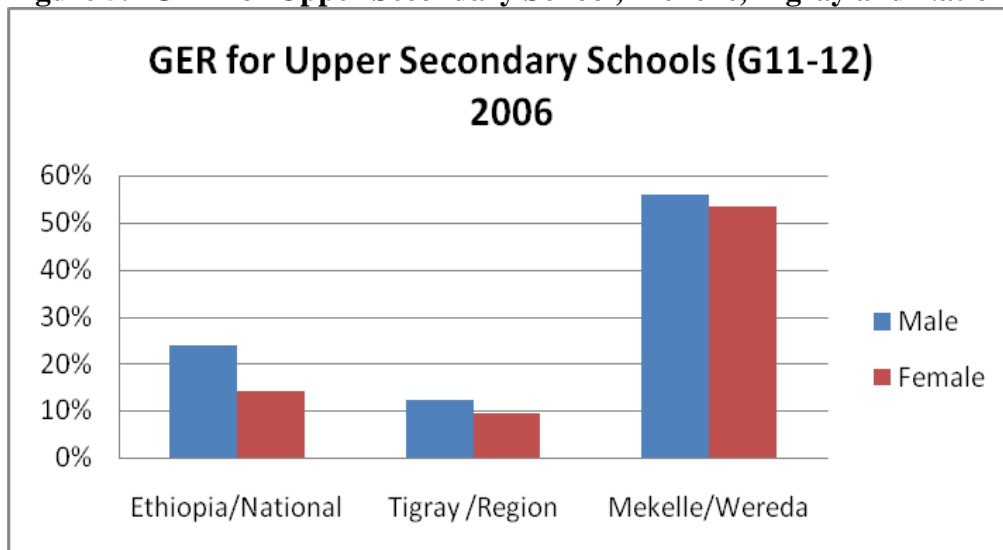
Figures 4 and 5 show that secondary school enrollment rates in 2007 were far greater than regional and national averages. They also show that Mekelle was well on its way to achieving gender parity in secondary school enrollment. It is important to keep in mind, when looking at the graphs below, that many of the students from these nearby rural *woredas* attend secondary school in Mekelle, thereby increasing the GER for the city.

**Figure 4. GER for Lower Secondary School, Mekelle, Tigray and National Levels 2007**



Source: Tigray Region Education Bureau: Education Statistics Annual Abstract (2007) and EFA GMR 2008

**Figure 5. GER for Upper Secondary School, Mekelle, Tigray and National Levels 2006**

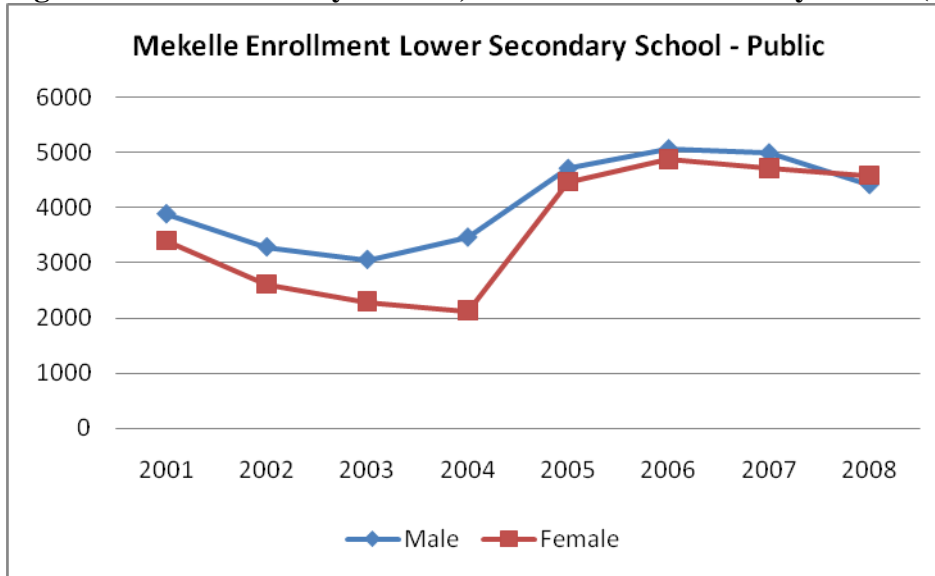


Source: Tigray Region Education Bureau: Education Statistics Annual Abstract (2006/07) and EFA GMR 2008



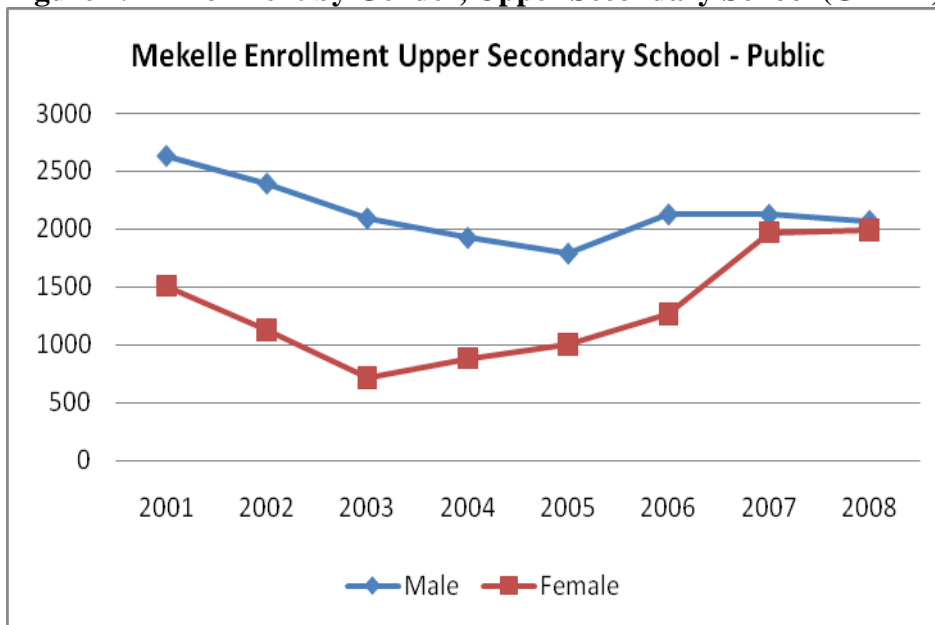
*Gender parity:* Figures 6 and 7 show the enrollment of boys and girls in lower and upper secondary school between 2001 and 2008. A gradual movement toward parity is evident.

**Figure 6. Enrollment by Gender, Lower Public Secondary School (G9-10), 2001-2008**



Source: Tigray Region Education Bureau: Office of Statistics, 2008

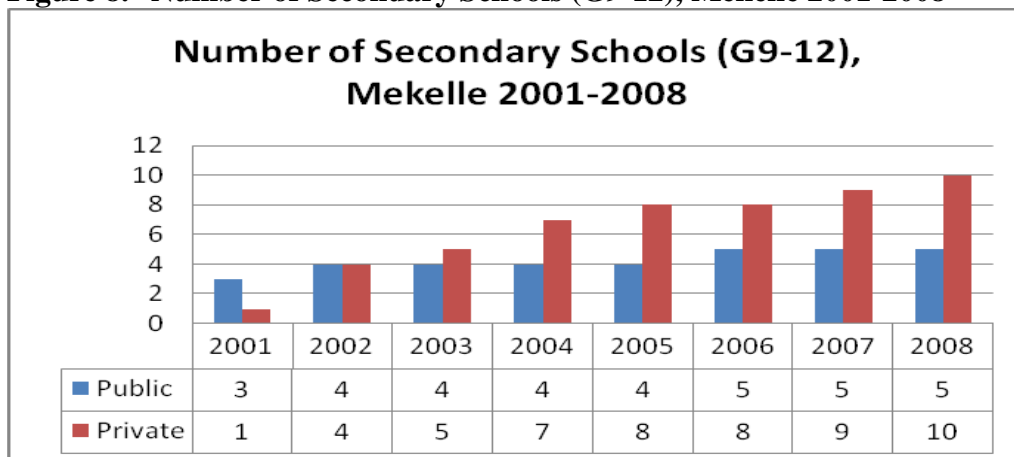
**Figure 7. Enrollment by Gender, Upper Secondary School (G11-12), 2001-2008**



Source: Tigray Region Education Bureau: Office of Statistics, 2008

Figure 8 shows that from 2001-2008 the number of public and private secondary schools increased. Whereas in 2001, there was one private school and three public schools, by 2007 there were nine private secondary schools and five public secondary schools. However, the number of secondary schools has failed to keep pace with the growth in primary school enrollments (Mekelle City Administration, 2008).

**Figure 8. Number of Secondary Schools (G9-12), Mekelle 2001-2008**



Source: Tigray Region Education Bureau: Education Statistics Annual Abstract 2008.

*Learning facilities and infrastructure in secondary schools:* Table 7 reveals the number of libraries and laboratories in public and private secondary school in 2007. According to these figures, each public secondary school has a library and at least one laboratory. However, many libraries lack books and many laboratories are not well equipped (Mekelle City Administration, 2008).

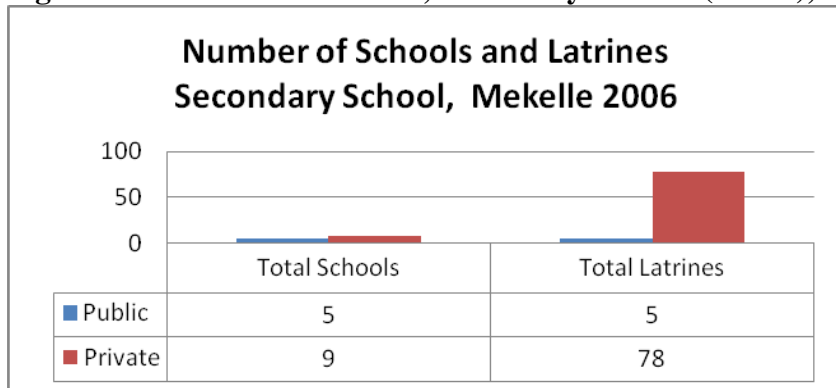
**Table 7. Number of Libraries and Laboratories in Secondary Schools, Mekelle 2007**

	Library	Laboratories
Public Secondary School	5	11
Private Secondary School	10	17
Total Secondary School	15	28

Source: Tigray Region Education Bureau: Office of Statistics, 2008

Figure 9 shows the number of schools and latrines in 2007. Of the five public secondary schools, two had no latrines; the other three had a total of five latrines.

**Figure 9. Number of Latrines, Secondary Schools (G9-12), Mekelle 2007**



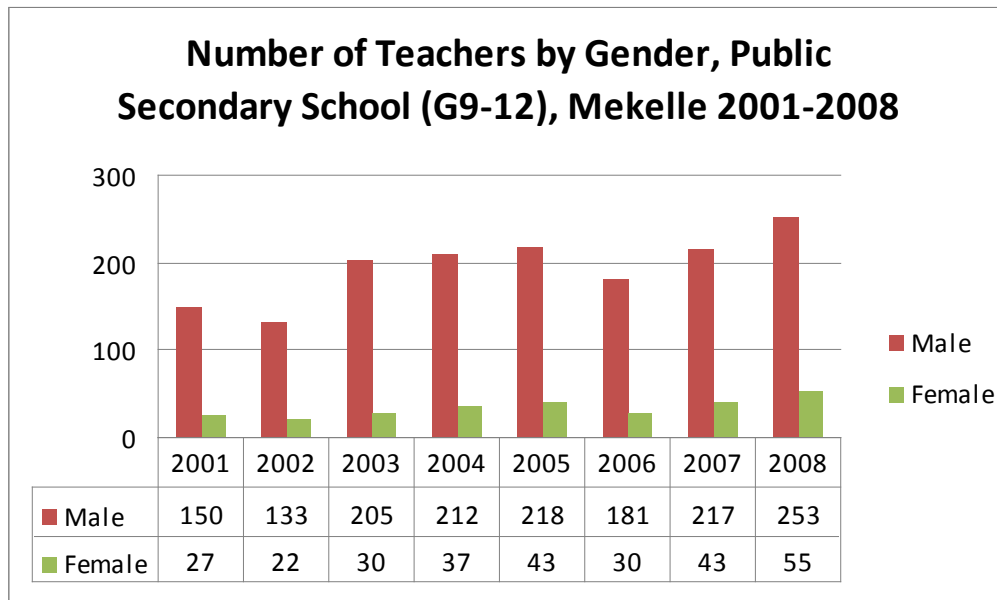
Source: Tigray Region Education Bureau: Education Statistics Annual Abstract 2008

On average, in the public secondary schools there were 2,757 students per latrine and 26 students per latrine in private secondary schools. Four of the five public secondary schools have either a tap or well water source, though students reported that most taps were dysfunctional. The fifth school had no water at all, and students brought their own water to school or bought water from local vendors.

*Issues relating to gender parity:* Insufficient and dirty latrines in secondary school pose a challenge to girls’ attendance and retention, thereby jeopardizing gender equity. Three public secondary schools had an insufficient number of functioning latrines. For reasons of safety and hygiene, girls need private, separate latrines.

The number of female teachers is also a vital element for the retention of girls in school. Female teachers serve as role models for female and male students. Figure 10 illustrates the number of female and male teachers in Mekelle public secondary schools. From 2001-2008 female teachers constituted between 12.7 and 16.5 percent of all teachers in public secondary schools.

**Figure 10. Number of Teachers by Gender, Public Secondary School, Mekelle 2001-2008**



Source: Tigray Region Education Bureau: Office of Statistics, 2008

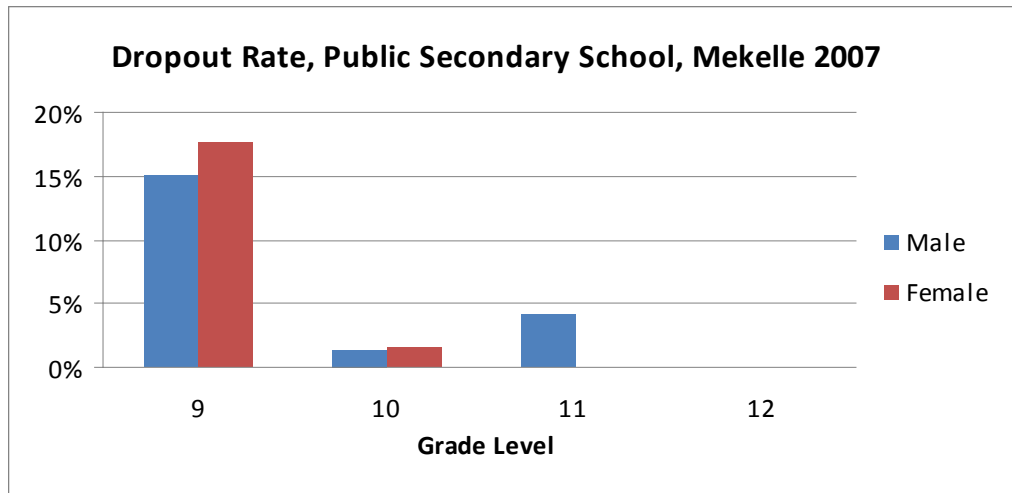
Quality of education is of course as important an issue in secondary school as in primary school. Since poor quality of education is well known as contributing to higher repetition and dropout rates, the alarmingly high rates given below are a good indication that low quality is a problem.

Many teachers expressed the need for more training and also indicated their dissatisfaction with Continuous Professional Development (CPD), the in-service training component of the new education package implemented by the Tigray Regional Education Bureau.

Figures 11 and 12 illustrate that, in 2007, the repetition rate was 70 percent for grade 10 boys and 72 percent for girls, and the ninth-grade dropout rate was 15 percent for boys and 18 percent for

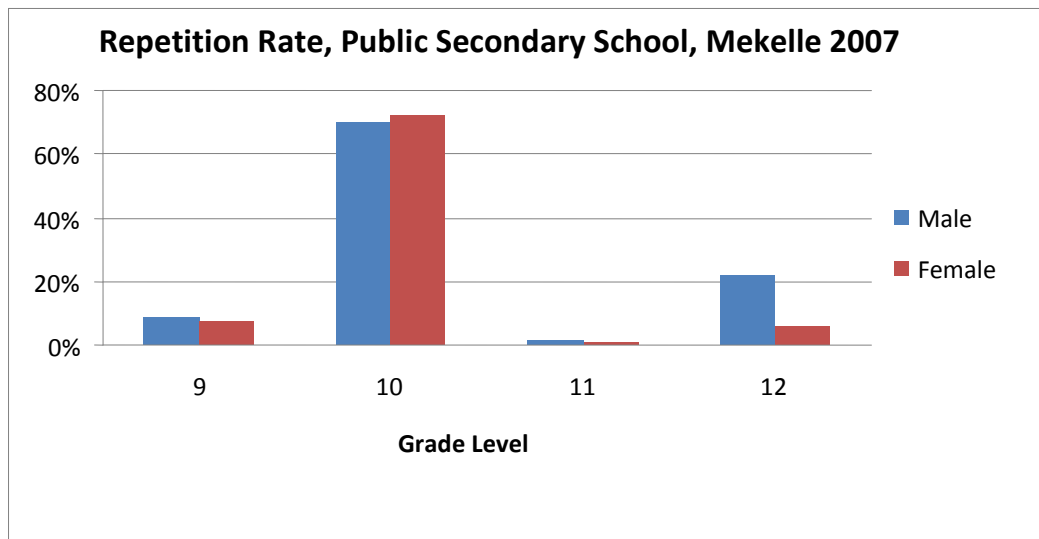
girls. Increased numbers of well-trained teachers, smaller class sizes and more substantial classroom resources have the potential to improve significantly the quality of education.

**Figure 11. Repetition Rates, Public Secondary School, Mekelle 2007**



Source: Tigray Region Education Bureau: Office of Statistics, 2008

**Figure 12. Dropout Rates, Public Secondary School, Mekelle 2007**



Source: Tigray Region Education Bureau: Office of Statistics, 2008

It is evident that repetition rates are particularly high in lower secondary school. Specifically, for 9<sup>th</sup> grade the repetition rate is 8 percent; for 10<sup>th</sup> grade, 71 percent. An extremely high repetition rate in 10<sup>th</sup> grade exists because students must pass a national exam to continue their studies. If unprepared for the exam, students repeat 10<sup>th</sup> grade until they are prepared. The dropout rate for 9<sup>th</sup> grade is 16 percent. The high dropout rate in 9<sup>th</sup> grade may be due to a change in the language of instruction from Tigrinya (mother tongue) to English, a difficult adjustment for many students.

In upper secondary, repetition for 11<sup>th</sup> grade is less than 1 percent, and for 12<sup>th</sup>, it is 16 percent. As in 10<sup>th</sup> grade, students may repeat 12<sup>th</sup> grade to prepare for the required national exam. Improving repetition and dropout rates in primary and secondary school clearly reduces costs.

*Student-teacher ratios:* the public secondary school student-teacher ratio in 2008 was 42 students per teacher, while at private schools the ratio was 27 students per teacher.

**Table 8. Student-Teacher Ratio (STR), Secondary School (G9-12), Mekelle 2008**

	Students	Teachers	STR
<b>Public</b>	13059	308	42
<b>Private</b>	2352	85	28

Source: Tigray Region Education Bureau

**Table 9. Student-Section Ratio (SSR), Secondary School (G9-12), 2007**

	Students	Sections	SSR
<b>Tigray</b>	104649	1639	64
<b>Mekelle</b>	13786	222	62

Source: Tigray Region Education Bureau: Education Statistics Annual Abstract 2007

*Access to learning materials:* Table 10 shows the student-to-textbook ratio for the core subjects taken by all students in the Tigray Region in 2007, whether they are in the social science or natural science track. As this table shows, there is a one-to-one ratio for the English Part I Mathematics books, but two or more students must share the English Part II book. . Figures for Mekelle were not available, but it is reasonable to assume that they were comparable to the regional figures.

**Table 10. Student-Textbook Ratio (SBR), Public Secondary School (G9-12), Tigray 2007**

	G9	G10	G11	G12
<b>English/part 1</b>	1.1	1.21	1.64	1.86
<b>English/part 2</b>	0.14	0.23	0.55	0.25
<b>Mathematics</b>	1.16	1.22	1.42	1.9

Source: Tigray Region Education Bureau: Education Statistics Annual Abstract 2007

Mekelle secondary school students in all grades are receiving instruction via satellite on plasma screen TVs provided by the SchoolNet Initiative, a private organization partnering with various government agencies. SchoolNet equips classrooms in secondary schools throughout the country with plasma screen TVs, to receive lessons via video broadcast for eight hours a day by satellite with content from the Educational Media Agency.<sup>11</sup> Although this program is mentioned only briefly in the Education Sector Development Program (ESDP III), teachers stated in interviews with MCI that the plasma TVs are used in secondary schools. The Ministry of Education develops the curriculum, and a South African company provides the technology. The use of

<sup>11</sup> The Guardian (2005), "Ethiopia's Digital Dream," August 4, 2005.

plasma TV is a consequence of the low-level of training of secondary school teachers. Classroom sessions typically last for 45 minutes, of which the plasma TV portion is 25 minutes, and the remaining 20 minutes utilized by teachers.

## **2.4 Special Education**

Mekelle has two schools for special needs students, one for vision-impaired students, and another for hearing-impaired students. The schools accept students from Mekelle as well as throughout the region of Tigray. However, the schools have insufficient classrooms and fences around school building. Additionally, the special education schools lack a sufficient number of teachers trained in special education, and also lack sufficient educational materials appropriate for students with special needs. The schools accommodate a mere 100 students despite a much larger special needs population in need of educational services across the region.<sup>12</sup>

## **2.5 Technical and Vocational Training (TVET)**

The priority areas identified by the Ethiopian Government in its Poverty Reduction Strategy Program are roads, education, agriculture and natural resources, and health. Success in these areas cannot be achieved without skilled human power at various levels. A dynamic TVET program is essential to the development of a skilled labor market responsive to the economy.<sup>13</sup> In Mekelle, there are three TVET schools, including one government and two non-government school, enrolling 1125 students in 21 various vocational and technical fields.<sup>14</sup>

Traditionally, TVET in Ethiopia is fragmented and provided by different agencies, including public TVET programs under the education sector, church-based NGOs, employer-based in-house programs run by public and private companies, private schools and on-the-job training. TVET programs are not systematically documented. From 1996-2005, the government expanded formal TVET programs, expanding enrollment from 3,000 to 106,300. Nevertheless, TVET still serves less than three percent of the relevant age group, and a systematic integration of TVET with the labor market remains to be achieved.<sup>15</sup> Continuing problems include underfunding, shortage of sufficient and trained TVET teachers/instructors and lack of effectiveness and efficiency.

Despite immense structural problems, the recent establishment of the National TVET Council was a significant step forward. The Council is comprised of representatives from different government sectors, including regional representatives, public and private TVET providers and the business community, representing the beginning of institutionalized stakeholder involvement and hopefully providing a strengthened system of management and governance.

The Mekelle City Administration indicated in a 2008 Project Proposal a desire for more emphasis on public partnership in the provision of TVET, and closer collaboration between micro and small-scale enterprises and training institutions.<sup>16</sup>

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<sup>12</sup> Mekelle City Administration, Project Proposal for Standardization of all Government Schools, September 2008.

<sup>13</sup> MOE (2005)

<sup>14</sup> Mekelle City Administration, Project Proposal for Standardization of all Government Schools, September 2008.

<sup>15</sup> Government of Ethiopia (2006)

<sup>16</sup> Mekelle City Administration, Project Proposal for Standardization of all Government Schools, September 2008.

## **2.6 Adult Education**

In the Tigray Region, the national adult education strategy program, directed at raising the knowledge and skills of those aged 15 years and above, includes basic reading, writing and computing skills. However, this program, like non-governmental sponsored adult learning programs, is limited to rural areas in Tigray, and not implemented in Mekelle.

## **2.7 Tertiary Education**

Under the previous regime, no colleges or universities existed in Mekelle. Fortunately, today there are various public and private higher education institutions, and Mekelle is second only to Addis Ababa regarding the number of higher education institutions within the city.<sup>17</sup>

In Mekelle, the five public higher education institutions are:

- Mekelle University
- Mekelle Institute of Technology
- Mekelle Middle-Level Health Professionals Training Institute,
- Mekelle Art School
- Mekelle College of Teacher Education

Mekelle University, established in 2000 has 12,000 student and seven faculties, which include the Faculty of Dry Land Agriculture and Natural Resources Management, Faculty of Business and Economics, Faculty of Science and Technology, Faculty of Law, Faculty of Education, Faculty of Veterinary Science, and the College of Health Sciences (Mekelle City Administration, December 2008).

Private higher education institutions include:

- New Millennium College
- Nile College
- Sheba Info-Tech and Business College
- Merha Tibeb Technical Training Center
- Tigray College
- Poly Institute of Technology
- Dembosco Vocational Training
- Open Business and Technology College
- Mars Engineering College
- Micro-link College

## **2.8 HIV/AIDS**

It is estimated that the prevalence of HIV in the urban areas of Tigray in 2005 was 13.3 percent, which is higher than the national urban prevalence of 10.5 percent (Ministry of Health, 2007).

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<sup>17</sup> Mekelle City Administration, Project Proposal for Standardization of all Government Schools, September 2008.

The impact of HIV/AIDS on education is multi-faceted. Demand for education is decreased because of the sickness and death of school-age children, their parents and teachers. Due to the early death of parents, orphans and vulnerable children (OVCs) often have little or no opportunity to attend school.

Frequent absenteeism among teachers and students adversely affects the quality and efficiency of education, as confirmed to MCI by the president of the Tigray Teachers Association. However, the Tigray Regional Education Bureau has not collected appropriate statistics related to HIV/AIDS.

Government officials in charge of HIV/AIDS and education in the Tigray Regional Education Bureau enumerated the following initiatives implemented to mitigate the impact of HIV/AIDS on education in Mekelle:

- Trainings conducted for students, teachers and administrators mobilizing HIV awareness;
- Books published on incorporating HIV/AIDS Awareness into the curriculum;
- Schools formed HIV/AIDS clubs that:
  1. Educate regarding HIV/AIDS;
  2. Teach students to counsel their peers on HIV/AIDS through drama and discussion;
  3. Fundraise for students affected by HIV/AIDS.

In primary schools, 26 of 33 public schools and 19 of 23 private schools have HIV/AIDS clubs; in secondary schools, there are clubs in four of five public and eight of nine private schools. In addition, the NGO Organization of Social Services for AIDS (OSSA) told MCI that anti-retroviral drugs (ART) are free at hospitals throughout Ethiopia for teachers with HIV, and in Mekelle, an American NGO donates additional medication (such as Bactrium, 3TC, Mebiraphin and Vitamin B40) needed by individuals with HIV/AIDS.

## 2.9 Orphans and Vulnerable Children (OVCs)

The Mekelle City Office of Education lacks specific provisions such as school feeding, educational supplies and/or school uniforms targeted at keeping OVCs in school. But the NGO OSSA provides many of these items, as well as psycho-social support, for orphans in Mekelle. Tables 11 and 12 indicate the number of OVCs in primary and secondary schools in Mekelle.

**Table 11. Orphans in Primary School, Mekelle 2006**

Mekelle, Primary Education, Orphans 2006									
	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8	Total
<b>Male</b>	53	56	80	76	63	51	72	99	550
<b>Female</b>	74	64	83	93	97	57	83	110	661
<b>Total</b>									<b>1211</b>

Source: Tigray Region Education Bureau, Office of Statistics



**Table 12. Orphans in Secondary School, Mekelle 2006**

<b>Mekelle, Secondary Education, Orphans 2006</b>					
	<b>Grade 9</b>	<b>Grade 10</b>	<b>Grade 11</b>	<b>Grade 12</b>	<b>Total</b>
<b>Male</b>	6	45	31	7	89
<b>Female</b>	7	30	38	3	78
<b>Total</b>					<b>167</b>

Source: Tigray Region Education Bureau, Office of Statistics

Food security has a major impact on attendance and the quality of education in primary and secondary schools, especially with respect to OVCs. Teachers indicated that hunger often prevented students from attending school or from concentrating in the classroom. Nonetheless, Awash Mesfin, Program Officer at the World Food Program (WFP), indicates that the Government of Ethiopia believes food security to be more of an issue in rural areas and therefore only provides food intervention in rural areas. Thus, Mekelle lacks school feeding programs. Should a program be implemented for 170 school feeding days per year, WFP estimates a cost of 19 cents per day, or \$18.82 per primary-aged student per school year.<sup>18</sup>

### **III. FINANCING OF EDUCATION**

Funding for education in Mekelle comes from various sources: government budget, student and family contributions, internal income (if the school produces its own income), community contribution (either in cash, labor or in kind) and other channels, which may include individual, NGO, corporate or international institutions.

Ethiopia officially abolished school fees in 1994 and incorporated the abolition policy into its Poverty Reduction Strategy Program (PRSP) in 2002. However, local education officials indicate that despite the formal abolition of school fees, families bear other indirect costs (uniforms, activity fees, transportation, school meals), as well as fees for the improvement of physical facilities, and these costs are a deterrent to school participation.

Additionally, when a child attends school instead of working, there is an opportunity cost of child labor, and this challenges enrollment, especially at the secondary level. The international NGO Save the Children (2004) has also pointed out that while community financing may be unavoidable given budget constraints, relying on community contributions for school construction and facilities often compromises educational equity, as communities with greater social capital and resources are better positioned to make investments that can significantly improve the quality of their educational offerings.

Recurrent spending on education increased by 59 percent from 1997 - 2002, though recurrent per capita spending on education remained low in absolute terms, at approximately \$3.18 (World Bank, 2007). Save the Children (2004) indicates that while budget share is an important

<sup>18</sup> WFP Mekelle, Ato Awash Mesfin, Program Officer (personal communication in August 2008).

indicator of the importance of education to the government, improvements in per capita expenditure are also an important indicator of government's commitment to improving school quality, particularly given the government's own success in increasing enrollment (Save the Children, 2004).

In accordance with Ethiopia's decentralization process within the education system, budgeted funds are allocated in gross to *woredas*, local administrative units. The decentralization process envisions *woredas* as the centers of socio-economic development, improving the delivery of social services through administration on the local level (MOFED, MDG in Ethiopia Report, 2004). Spending decisions, in accordance with the Ministry of Education's decentralization policy, are delegated to the *woredas*.

On average, teachers absorb the bulk of available resources, leaving very limited amounts for non-salary items. Primary and secondary teaching staff expenses encompass over 80 percent of the overall expenditures for education in Mekelle; combined with non-teaching staff expenses, that figure is nearly 85 percent. However, maintaining pace with enrollment necessitates more teachers and thus more expenditure on teaching staff salaries. Therefore, throughout the education system, the overall picture is one of very limited funding for non-salary educational expenditures. According to the World Bank, "this pattern of resource allocation is at odds with what would seem sensible, given the consistent finding in the research literature that textbooks and pedagogical supplies are among the most cost-effective inputs for improving student learning (World Bank, 2005, p. 79)."

Table 13 summarizes total public and primary school expenditures for 2007. As previously noted, teaching staff expenses comprise the bulk of education expenditures, estimated at 7,592,468 birr (USD 799,207) for primary school teaching staff, and 3,295,263 birr (USD 346,869) for secondary school teaching staff. Total government primary school expenditures are approximately 9,643,656 birr (USD 1,015,016), while total secondary school expenditures are approximately 4,456,742 birr (USD 469,130).

**Table 13. Government Primary and Secondary School Expenditures, Mekelle, 2007**

Education Expenditures	Primary School (birr) <sup>19</sup>	USD	Secondary School (birr)	USD
Teaching Staff Expenses	7,592,468	799,207	3,295,263	346,869
Non-Teaching Staff Expenses	710,681	74,809	309,366	32,564
Running Cost	269,769	28,397	412,989	43,473
Fixed Asset	160,505	16,895	57,740	6,077
Education Materials	209,568	22,060	151,745	15,973
Construction & Renovation	135,359	14,248	68,573	7,218
Others	564,306	59,401	161,066	16,954
Total	9,642,656	1,015,016	4,456,742	469,130

Source: Tigray Region Education Bureau: Office of Statistics, 2008

<sup>19</sup> Conversion rate: \$ 1 = 9.5 birr

Schools are allocated block grants by the Federal Government for operational costs. The allotment per student in grades 1 to 8 is 10 birr per student per year and for students in grades 9-10 it is 20 birr. Schools are also allocated funds for furniture and classroom construction. The 2009 allocations for Mekelle schools were as follows.

**Table 14. 2009 Allocations for Salaries, Administrative and Capital Expenditures**

Grade level	Budgeted Item	Expenditures for salary (birr)	Block Grant (birr)
	Administrative cost	991,574.00	
(1-4)	Salary	8,043,197.00	146,580.00
(5-8)	Salary	9,477,036.00	188,300.00
(9-10)	Salary	5,224,956.00	193,153.00
(11-12)	Salary	1,603,382.00	
	Capital costs (Furniture and class construction)	1,000,000.00	
	Total	26,340,145.00	528,033.00

Source: Mekelle City Education Office

### Unit Costs

As Table 15 indicates, according to the Tigray Region Education Bureau, the total cost of constructing one lower primary school is approximately 500,000 birr (USD 40,660)<sup>20</sup>. The cost constructing one upper primary school is approximately 950,000 birr (USD 77,235). According to the Tigray Region Education Office, the unit cost to build one classroom is approximately 62,500 birr (USD 5,081) and the unit cost to build a latrine is 5,000 birr (USD 406).<sup>21</sup>

**Table 15. Primary School Construction Costs, Mekelle 2009**

Lower Primary School (Grades 1-4)	Upper Primary School (Grades 5-8)
1 block (4 classrooms)	2 blocks (8 classrooms)
1 block (for administration)	1 block (laboratory and library)
1 separate toilet for boys and girls	1 separate toilet for boys and girls
	1 block (for administration)
<b>Total Cost: 500,000 birr (USD 40,660)</b>	<b>Total Cost: 950,000 birr (USD 77,235)</b>

Source: Tigray Region Education Bureau, August 2009.

### Simulations

Through use of the EPSSIM model, this section aims to estimate of the cost for Mekelle to achieve Millennium Development Goals 2 and 3 by the year 2015. Three scenarios are presented: a Baseline Scenario; a Fast Track Scenario; and an Efficiency Scenario. The three scenarios use different assumptions to estimate costs and project the number of teachers and classrooms needed.

<sup>20</sup> Exchange rate: \$1 = 12.30

<sup>21</sup> The unit cost for toilet construction is from Tigray Regional Office plan to build 16 pit toilets (eight for each gender) for 400 students, with a total cost of 80,000 birr (USD 6,505). This translates to 5,000 birr per toilet

In the EPSSIM simulation model, the following assumptions and targets were specified.

### 3.1 Baseline scenario

The baseline scenario utilizes 2007 population data and projected population growth to determine future funding levels required to achieve MDGs 2 and 3 by 2015. In the EPSSIM simulation model, targets were used to calculate the baseline scenario to achieve universal primary education and gender parity in the schools by 2015 (Tigray Region Education Bureau, 2006/07 and the Mekelle City Office of Education 2006).

The baseline scenario surmises that the targeted pupil/teacher ratio is 45 students per teacher. In addition, the primary school student/section ratio in 2007 was 52 students per section but the goal is to reduce it to 45 students per section. The same target is set for the student/section ratio at the secondary school level.

**Table 16. Baseline Scenario Assumption**

Baseline Scenario Assumptions		
	Primary Education	Secondary Education
Promotion Rate	99%	95%
Student/Teacher Ratio	45	
Student/Section Ratio	45	50
Ratio Trained Teachers	95%	100%
Ratio Non-Trained Teachers	5%	0%
Teacher Utilization Rate		85%

Source: Tigray Region Education Bureau: Office of Statistics, 2008

### 3.2 Fast-Track Scenario:

This scenario is based on the assumption that the MDGs can be achieved by 2012, hence the time frame for MDG achievement is condensed to five years from 2007, instead of the eight-year timeline used in the Baseline Scenario. Repetition at the primary level is not permitted, and at the secondary level, repetition is reduced to one or two percent.

### 3.3 Efficiency Scenario:

This scenario is based on the assumption that efficiency can be increased by reducing repetition and dropout rates. The dropout rate affects efficiency because when students drop out, resources invested in students are wasted. An important consideration is that girls tend to repeat and drop out at higher rates; therefore specific measures need to be taken to ensure gender parity.

Table 17 delineates targets used to reduce wastage and improve efficiency in the EPSSIM model for the efficiency scenario. Essentially, the promotion rate for primary education should be 100% and the repetition rate is reduced to 1-5%; for secondary education, the promotion rate should reach 99% with a 1% repetition rate.

**Table 17. Efficiency Scenario**

Efficiency Scenario Targets		
	Primary Education	Secondary Education
<b>Promotion Rate</b>	100%	99%
<b>Repetition Rate</b>	1-5%	1%
<b>Registration Rate</b>		95%
<b>Teacher Utilization Rate</b>		100%

Source: Tigray Region Education Bureau: Office of Statistics, 2008

#### 4.0 Simulation Results

Table 18 presents EPPSIM simulation results for the three scenarios. In the Baseline Scenario, total enrollment in public primary schools was 42,054 in 2007 and the number of classrooms was 350. For secondary school total enrollment was 13,786, and the number of classrooms was 97.

**Table 18. Classroom, Teachers and Investment Requirements 2007-2015**

	Baseline 2007	Fast-Track 2012	Efficiency 2015
<b>Classrooms Required</b>			
Primary	350	891	503
Secondary	97	169	166
<b>Teachers Required</b>			
Primary	827	990	806
Secondary	315	573	584
<b>Teacher-Student Ratio</b>			
Primary	51	45	45
Secondary	44	16	16
<b>Investments Required</b>			
<b>Total – Primary and Secondary School (birr)</b>	20,784,435	86,746,025	49,930,900
<b>Recurrent Costs – Primary &amp; Secondary</b>	16,868,397	25,709,329	29,237,938
<b>Capital Costs – Primary &amp; Secondary</b>	3,916,038	61,036,696	20,692,963

Source: Calculations based on EPSSIM simulations

The figures in Table 18 are for the year 2007 under the Baseline Scenario, for the year 2012 under the Fast-Track, and for the year 2015 under the Efficiency Scenario. The total costs for providing public primary and secondary schooling during the 2010-2015 period are: 412.4 million birr (USD 43.4 million) under the Baseline Scenario; 316.7 million birr (USD 33.3 million) under the Efficiency Scenario; and 319.7 million birr (USD 33.7 million) under the Fast Track Scenario. These total amounts include both recurrent and capital costs.

It can be seen that in the Fast-Track Scenario, more classrooms will be required by 2012 and more teachers will also have to be hired than under the Efficiency Scenario in 2015. This is because the infrastructure and human resources will be required sooner.

In terms of costs, the recurrent costs in 2012, under the Fast-Track Scenario, and the recurrent costs in 2015 under the Efficiency Scenario, are not very different but they are higher than the recurrent costs in the Baseline Scenario. This is not surprising since recurrent costs tend to increase over time. However, the capital costs under the Fast-Track Scenario in 2012 are much higher than the capital costs under the Efficiency Scenario in 2015. This is likely because most school will have to be built by 2012 in the Fast Track scenario whereas there will not be a need to build many schools in 2015 under the Efficiency Scenario. The per capita costs to provide primary and secondary education are presented below.

**Table 19. Annual Per Capita Cost to Provide Primary and Secondary Education**

<b>Costs per Pupil (in birr) - Baseline Scenario</b>							
	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>
<b>Primary School</b>	459	553	664	875	1234	1950	920
Recurrent costs	288	302	316	331	347	363	381
Capital costs	171	251	348	544	888	1587	539
<b>Secondary School</b>	634	657	692	719	768	854	756
Recurrent costs	457	480	504	530	558	588	621
Capital costs	177	177	188	189	211	266	135

<b>Costs per Pupil (USD) - Baseline Scenario</b>							
	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>
<b>Primary School</b>	37	45	54	71	100	159	75
Recurrent costs	23	25	26	27	28	30	31
Capital costs	14	20	28	44	72	129	44
<b>Secondary School</b>	52	53	56	58	62	69	61
Recurrent costs	37	39	41	43	45	48	50
Capital costs	14	14	15	15	17	22	11

#### **IV. CONCLUSIONS AND RECOMMENDATIONS**

The city of Mekelle is likely to achieve universal primary education (MDG 2) and gender parity in educational institutions (MDG 3) by 2015. Primary enrollment had been steadily increasing since 2000, and there are more girls are enrolled in primary school than boys in both public and private schools, indicating that gender parity at the primary school level has been achieved in Mekelle. However, gender parity can be maintained by increasing both private bathroom facilities for girls and the number of female teachers at primary schools. The following is a summary of the needs assessment's main findings and a presentation of some recommendations.

At the pre-primary school level, the demand for pre-schools is increasing. As a result, more preschools need to be built, and the city needs to hire and train pre-school teachers and provide instructional and learning materials. Moreover, there is a need for the Government of Ethiopia, the Tigray regional authorities and Mekelle City to explore expanding pre-school alternatives such as the Child to Child Initiative.

At the primary school level, increasing enrollments requires that additional teachers be hired and facilities be built. Another pressing issue is improving the quality of education. By improving teacher training and providing teachers with appropriate instructional materials, educational

quality can be significantly enhanced. In addition, many libraries have been turned into classrooms to alleviate overcrowding; hence, building additional classrooms and schools is essential to improving educational quality.

At the secondary school level, there is a need to construct more school buildings to keep pace with the increasing number of students now attending primary schools. Moreover, efforts must be made to reduce girls' repetition rates, particularly in eighth grade, when girls are more likely to drop out. The lack of adequate, hygienic toilet facilities challenges girls' attendance and retention, thereby jeopardizing gender equity. More latrines must be built, and separate, private latrines must exist for girls.

Efforts must also be made to improve libraries and laboratories. Many books in libraries are outdated or irrelevant to the school curriculum. Although secondary schools have laboratories, many of them are not well equipped.

The high repetition rates in grade 10 require urgent attention. A high percentage of students apparently choose to repeat the grade for fear of failing the national exam administered in that year. The repetition rates contribute to inefficiency and wastage of resources and need to be reduced.

Current initiatives being undertaken to strengthen educational quality include in-service and pre-service teacher training, and the provision of instructional materials. These are cost-effective approaches that can improve educational quality while maintaining increased access. The requirement to teach at lower primary schools (grades 1-4) is a certificate from a Teacher Training Institute and in upper primary schools, teachers are required to have a diploma. In-service training arrangements such as a six weeks training course at a Teacher Training Institute and a refresher course for teachers with bachelors degrees need to be sustained. There are various pre-service trainings in existence that are producing better trained and more experienced teachers.

It is also important to note that accommodations for special needs students are insufficient. There are only two schools that address any special needs, both of which cater only to blind and deaf students, and both schools lack essential educational materials, qualified teachers and classroom space. No other disabilities are addressed, and there is limited teacher training or sensitization regarding special needs students.

To sustain the progress the city of Mekelle has made toward the attainment of the education MDGs, the private sector and international donors should be encouraged to contribute to further financing for education. The Government of Israel's effort, through the Ministry of Foreign Affairs Office of International Cooperation (MASHAV), in cooperation with the MCI, to assist with latrine construction in Mekelle schools might serve as a model for other donor nations committed to ensuring that the student populations in developing world cities such as Mekelle are afforded universal access to the basic educational opportunities that can enable them to realize their full potential.

## REFERENCES

- Bowman, M.J. and Anderson, C.A. (1980). "The participation of women in education in the Third World," *Comparative Education Review*, 24(2), pp. S13-S32.
- Bureau of Finance and Economic Development of Tigray [BOFED] (2009). "Administrative boundary delineation of Mekelle Town," Prepared by GIS-Cartography Unit of BOFED (Mekelle: BOFED).
- Ethiopian Bureau of Planning and Economic Development (1998). *National Regional Government of Tigray Population Projection of Tigray Region July 1, 1995 – July 1, 2010* (Addis Ababa: Ethiopian Bureau of Planning and Economic Development).
- Ethiopian Ministry of Education [MOE] (2005). *Education Sector Development Program III (ESDP III), Program Action Plan* (Addis Ababa: Ethiopian MOE).  
[www.fasttrackinitiative.org/library/Ethiopia\\_Education\\_Plan\\_August\\_2005.pdf](http://www.fasttrackinitiative.org/library/Ethiopia_Education_Plan_August_2005.pdf) (Accessed February 2008).
- Ethiopian Ministry of Finance and Economic Development (2005). *Ethiopia: The Millennium Development Goals (MDGs) Needs Assessment Synthesis Report* (Addis Ababa: Ethiopian Ministry of Finance and Economic Development).
- Ethiopian Ministry of Health (2007). *Health and Health Related Indicators, 1999 E.C. (2006/07)*. Planning and Programming Department (Addis Ababa: Federal Ministry of Health).
- Gebremedhin, T. and Whelan, S. (2007). "Prices and poverty in urban Ethiopia," *Journal of African Economies*, 17(1), pp. 1-33.
- The Guardian* (2005). "Ethiopia's Digital Dream," 4 August 2005.
- Government of Ethiopia (2006). "Ethiopian national technical & vocational education and training [TVET] strategy," (Addis Ababa: Government of Ethiopia).
- Honig, B. (1995). *Household Demand for Primary Schooling in Ethiopia*. Paper presented at the Annual Meeting of the American Educational Research Association (San Francisco, CA: ERIC Document Reproduction Service No. ED 389082).
- Lasonen, J., Kemppainen, R., and Raheem, K. and Institute for Educational Research (2005). "Education and training in Ethiopia: an evaluation of approaching EFA goals," (Jyvaskyla, Finland: Jyvaskyla University Press).
- Mekelle City Administration (2008), *Project Proposal for Standardization of all Government Schools* (Mekelle: Mekelle City Administration).



- Ministry of Finance and Economic Development [MOFED] of the Federal Democratic Republic of Ethiopia and the UN Country Team (2004). *Millennium Development Goals: Challenges and Prospects for Ethiopia* (Addis Ababa).  
<http://planipolis.iiep.unesco.org/upload/Ethiopia/Ethiopia%20MDG%20Report.pdf> (Accessed March 2009).
- Patton, M. Q. (2002). *Qualitative Research and Evaluation Methods, 3<sup>rd</sup> Edition* (London & New Delhi: Sage Publications).
- Rose, P. & Al-Samarrai, S. (2001). "Household constraints on schooling by gender: empirical evidence from Ethiopia," *Comparative Education Review*, 45(1), pp.36-63.
- Save the Children US Ethiopia Field Office. (2006). "Learning from children, families, and communities to increase girls' participation in primary school,"  
[www.positivedeviance.org/projects/ethopedu/Ethiopia\\_girls\\_ed.pdf](http://www.positivedeviance.org/projects/ethopedu/Ethiopia_girls_ed.pdf) (Accessed February 2008).
- Save the Children (2004). "Who is benefiting most from education expansion in Ethiopia?" (Save the Children UK: Ethiopian Development Research Institute).
- Tigray Region Education Bureau. (2007). *Education Statistics Annual Abstract 2006/2007* (Mekelle: Tigray Region Education Bureau).
- UNESCO (2007). *EFA Global Monitoring Report 2008* (Paris: Oxford University Press).
- UNESCO-IBE. (2006). *World Data on Education - Ethiopia, 6<sup>th</sup> Edition, 2006/07*.  
<http://www.ibe.unesco.org/en/access-by-country/africa/ethiopia.html> (Accessed November 2008).
- Weir, S. (2007). "An examination of some mechanisms underlying externality benefits of girls' schooling," *Journal of Popular Economics*, 20(1), pp. 203-222.
- World Bank (2005). *Education in Ethiopia: Strengthening the Foundation for Sustainable Progress* (Washington, D.C.: The World Bank).

## **ANNEX 1 – Interview Guide**

### **FOR OFFICIALS AND TEACHERS**

For Primary and Secondary, ask for views on the following:

- Condition of facilities.
- Adequacy of teacher/professional training.
- Problems between national and local levels of government.
- Cooperation between national and local levels of government.
- Adequacy of special educational programs or programs to meet special needs.
- Major barriers/impediments to attendance (fees, parent education, social/cultural factors, economic considerations).
- Overall quality of education and adequacy of curriculum.
- Availability of books, supplies, other materials.
- Is there adequate encouragement for girls to attend school (latrines, privacy)?
- Please comment on financing of education. Is government financing adequate? Is there additional financing from local businesses, NGOs and communities?

For Adult Education and Vocational, ask for views on following:

- Are programs and curricula geared to needs of the market place/labor market?
- Are there partnerships or cooperation between schools and local business establishments?
- Comment on job placement success rate.
- Are businesses satisfied with quality of vocational education?
- Are language and literacy part of the curriculum?

## **ANNEX 2 – Government and NGO Officials and Educators Interviewed**

- **University of Mekelle**
  - Vice President of Administration and Development, Teklay Tesfay
  - Assistant Vice President of Academics and Research, Dr. Kindeya G/Hiwot
  
- **Tigray Regional Education Bureau**
  - Head of Tigray Regional Education Bureau, Ato Abraha Kiros
  - Planning Department, Statistician, Ato Gebremedihn Mesfin
  - Division Head for Student Services (education official responsible for response to HIV/AIDS in schools in Tigray), Ato Hasen Sed
  - Special Education Expert (VSO volunteer working for Ed Bureau), Mike Chart
  - Expert on Nonformal Education, Ato Abraha Mekonnen
  
- **Mekelle City Education Office,**
  - Head of Office, Ato Kahsu Adane
  
- **TVET Commission**
  - Team Leader of Planning and Projects, Ato Kiflom Teklu
  - DED (German Government Aid), Technical Consultant, Helga Schneider
  
- **Mekelle Teacher Training College**
  - Dean, Ahmed Reja
  
- **Tigray Teachers Association**
  - President, Ato Alem
  
- **Curriculum Department**
  - Team Leader and Acting Dept. Head, Mahtot Aberah
  
- **Tigray Bureau of Finance and Economic Development**
  - Planning and Budget Team Leader, Ato Solomon
  - Deputy Head, Yemane Yosef
  
- **World Food Program**
  - Program Officer, Ato Awash Mesfin
  
- **Organization for Social Service for AIDS (OSSA)**
  - Acting Head Director, Romha Haile Salesse
  
- **Sheba College**
  - Assistant Professor, Acting Director, Dr. Solomon Afework

### **Teachers: Secondary I and II:**

- 2 male teachers of 9<sup>th</sup> and 10<sup>th</sup> grades (lower secondary)
- 2 male teachers of 11<sup>th</sup> and 12<sup>th</sup> grades (upper secondary)