

DEMOGRAPHIC AND SOCIOECONOMIC COVARIATES OF  
PRIMARY SCHOOL PUPILS ATTRITION IN ETHIOPIA

Berhan Hailu Ebuy

DOCUMENTATION CENTRE  
INSTITUTE OF DEVELOPMENT RESEARCH  
ADDIS ABABA UNIVERSITY  
P. O. Box 1176, ADDIS ABABA  
ETHIOPIA

*A thesis submitted to the School of Graduate Studies of Addis Ababa  
University in partial fulfillment of the requirements for the Degree of  
Master of Science in Demography.*

Addis Ababa University  
Addis Ababa, Ethiopia  
June, 2001

72c  
B4 D4  
2001

**ADDIS ABABA UNIVERSITY**  
**School of Graduate Studies**

**Demographic and Socio-economic Covariates of  
Primary School Pupils Attrition in Ethiopia**

**BY**  
**Berhan Hailu Ebuy**

**Demographic Training and Research Center  
Institute of Development Research**

**Approved by the Examining Board**

Eshetu Girma  
Chairman, Department Graduate Committee

[Signature]  
Signature

Dr. P. K. MURTHY  
Advisor

[Signature]  
Signature

Darge Wole  
External Examiner

[Signature]  
Signature

Dr. A. P. Deshpande  
Internal Examiner

[Signature]  
Signature

*This thesis is dedicated to my mother Yalem-mebrat Hailemariam,  
to my sister Mahliete-Tsige Hailu (Edmond), and to the "Ideal Lady"*

DOCUMENTATION CENTRE  
INSTITUTE OF DOCUMENTATION AND LIBRARY SCIENCE  
ADDIS ABABA UNIVERSITY  
P. O. Box 1336, ADDIS ABABA  
ETHIOPIA

## ACKNOWLEDGEMENT

There have been many people and organisations that contributed to this study and without whose assistance it could not have been carried out. First and foremost, I am greatly indebted to my advisor Dr. P.K. Murthy for his unreserved assistance throughout the study. What ever merit it has, is in large due to his thoughtful guidance, his timely encouragement and his willingness to spend his precious time and effort to read and improve the first draft.

I would also like to acknowledge the Ethiopian Central Statistical Authority and its concerned staff for the provision of the raw data and for their warmly welcoming and replying my questions related to the data.

Special thanks are due to Ato Amare Asgedom (Associate professor and director, Institute of Educational Research, A.A.U.), Dr. Samuel I. Kalu (M.Sc.Thesis Co-ordination Delegate of DTRC), and Ato Mulugeta Gebreselassie (lecturer department of statistics, A.A.U.), for their constructive comments and suggestions, during the preparation of my proposal for the present study.

My gratitude goes to the co-ordinator of the Demographic Training and Research Centre (DTRC), Ato Eshetu Gurmu, as well as to the staff members and students of DTRC for their constructive comments during my presentation of the preliminary findings, which helped me in shaping the final work.

I would also like to thank the Government of the Regional State of Tigray for the sponsorship of my graduate study and the School of Graduate Studies of the Addis Ababa University for the sponsorship of the present study.

My sincere thanks go to Dr. Joseph Bastian (senior policy and planning specialist, USAID, BESO project, Tigray region), for encouraging me to join the Demographic Training and Research Centre as a graduate student as well as for his unlimited assistance throughout my graduate study.

My thanks are also due to Dr. Thomas Tilson, (Chief of party USAID, BESO project Ethiopia), Ato Yibrah Girmay, (Dean, Admas College, A.A.), Ato Jemal Ibrahim (Deputy G/Manager, Assem Pvt. Ltd. Company, A.A.), Dr. Wana Leka, (Institute of Educational Research, A.A.U.), Ato Ayalew Shibeshi, (Associate professor, faculty of education, A.A.U.), Dr. Abdulhamid Bedri (IDR, A.A.U.), Ato Daniel Meread, Ato Tezera Bekelle, W/ro Eyerusalem Mekonnen, and Ato Tesfaye Kelemework (Planning and Programming Department, MOE), for their tireless inspiring encouragement and assistance to carryout the study.

My deepest appreciation and greatest debt goes to my wonderful mother, Yalem-Mebrat Hailemariam for her tireless effort in educating her children. She dropped out of her primary schooling at an early stage due to early marriage, and experienced a series of internal migrations at times of war and peace in order to enable me continue my education and to reach at this stage.

I am especially indebted to my faithful friend Estifanos Berhane for his invaluable help throughout my postgraduate study and without whose help it would hardly be possible to complete my study.

Last but not least I thank W/ro Almaz Beyene and W/ro Roman Belachew, Education Management Information Systems, (MOE), for providing me with the necessary information, during the preparation of the proposal.

## TABLE OF CONTENTS

ACKNOWLEDGEMENTS.....	ii
LIST OF TABLES .....	viii
LIST OF FIGURES .....	ix
LIST OF APPENDICES.....	x
ABSTRACT.....	xi

## CHAPTER ONE

### INTRODUCTION

<b>1.1. Background of the Study .....</b>	<b>1</b>
1.1.1. Education: A basic Human Right and Building Block of Development.....	1
1.1.2. Primary education and demographic phenomena.....	2
1.1.3. Integration of Education, population and Development Planning.....	4
<b>1.2. Background of the Study Area.....</b>	<b>6</b>
1.2.1. An Overview of the Demographic and Socio-economic Profile of Ethiopia.....	6
1.2.2. A Brief Historical Profile of the Ethiopian Education System.....	9
<b>1.3. Statement of the problem.....</b>	<b>17</b>

<b>1.4. Review of Related Literature.....</b>	<b>22</b>
1.4.1. A Review of Primary School Enrolment and Attrition Situation in Some Developing Countries.....	22
1.4.2. A Review of Factors Associated with Primary School Pupils Attrition.....	24
1.4.2.1. Demographic Factors.....	24
1.4.2.2. Socio-economic Factors.....	26
1.4.3. A Review of related studies on the Ethiopian context.....	30
<b>1.5. Objectives of the Study.....</b>	<b>32</b>
1.5.1. General Objective.....	32
1.5.2. Specific Objectives.....	32
<b>1.6. The Study Hypotheses.....</b>	<b>33</b>
<b>1.7. The Conceptual Framework.....</b>	<b>34</b>
<b>1.8. Significance of the Study.....</b>	<b>35</b>
<b>1.9. Scope and Limitations of the Study.....</b>	<b>37</b>

## CHAPTER TWO

### DATA AND METHODOLOGY

<b>2.1. Source of the Data.....</b>	<b>39</b>
<b>2.2. Quality of the Data.....</b>	<b>42</b>
<b>2.3. Modelling/Methods of Analysis.....</b>	<b>46</b>
2.3.1. Covariates Selected for the Study.....	50

**CHAPTER THREE**

**ANALYSES, RESULTS AND DISCUSSION**

**3.1. Bivariate Analysis and Results.....54**

**3.2. Multivariate Analysis and Results.....63**

    3.2.1. Model Adequacy ..... 63

    3.2.2. Demographic Covariates of Primary School Pupils Attrition.....65

    3.2.3. Socio-economic Covariates of Primary School Pupils Attrition.....71

**3.3. Discussion.....72**

**CHAPTER FOUR**

**SUMMARY, CONCLUSIONS, AND POLICY RECOMMENDATIONS**

**4.1. Summary..... 79**

**4.2. Conclusions.....81**

**4.3. Policy Recommendations..... 84**

**REFERENCES.....86**

**APPENDICES.....95**

## LIST OF TABLES

Table 2.1.	Single Age Distribution of Primary School Pupils Enrolment Based on the 1998 WMS .....	40
Table 2.2.	Regional distribution of actual total primary school enrolment and sample data used for the study (Ethiopia, 1996/97).....	42
Table 2.3.	Myers' blended index for primary school pupils age data (Ethiopia, 1996/97).....	45
Table 2.4(a).	Demographic covariates included in the study (Ethiopia, 1996/97).....	52
Table 2.4(b).	Socio-economic covariates included in the study (Ethiopia, 1996/97).....	53
Table 3.1	Primary school enrolment stay-ins and dropouts by region and sex (Ethiopia, 1996/97).....	56
Table 3.2.	Pearson chi-square test of primary school grade level pupil dropouts (Ethiopia, 1996/97).....	58
Table 3.3.	Percentage share of primary school grade level pupil stay-ins and dropouts (Ethiopia, 1996/97).....	59
Table 3.4.	Trend of dropout rate at grade one (Ethiopia, 1994/95-1998/99).....	60
Table 3.5.	Trend of primary school dropout rates (Ethiopia, 1994/95-1998/99).....	60
Table 3.6.	Percentage of primary school stay-ins and dropouts for each category of demographic and socio-economic covariates (Ethiopia, 1996/97).....	61
Table 3.7.	Goodness-of-fit measures for the final logistic regression model on primary school pupils attrition (Ethiopia, 1996/97).....	64
Table 3.8.	Results of the final logistic regression model for demographic and socio-economic covariates of primary school pupils attrition entered on stepwise, (Ethiopia, 1996/97).....	66

## LIST OF FIGURES

Figure 1.1. Geographical Map of Ethiopia.....	14
Figure 1.2. Structure of the former Ethiopian Education System (before 1994).....	15
Figure 1.3. Structure of the new Ethiopian Education System (1994 on ward).....	16
Figure 1.4. Conceptual framework showing the inter-relationship of the covariates, which affect primary school pupils attrition.....	34
Figure 2.1. Single age distribution of primary school pupils included in the study, (Ethiopia, 1996/97).....	41
Figure 2.2. Patterns of terminal digit preference deviations from the expected 10 percent (Ethiopia, primary school pupils, 1996/97).....	45
Figure 3.1. Trend in primary school dropout rate (Ethiopia, 1994/95-1998/99).....	61

## LIST OF APPENDICES

Appendix 1: List of abbreviations .....	94
Appendix 2: Definition of technical terms .....	96

## ABSTRACT

Next to survival, food, clothing and shelter, education is children's greatest need after the age of six or seven. Without education, children can do little when they become adults, to improve their living conditions and to participate in development activities.

Primary education equips people with the skills of literacy and numeracy and therefore contributes to poverty reduction by increasing labour productivity. Besides, primary education serves as a bridge towards slower population growth and plays a critical role in demographic transition. Past and current evidences in Ethiopia however, reveal that many primary school pupils are leaving the system at early stages. For instance out of 1,107,751 pupils enrolled in grade one in 1994/95, only 39.1% of them completed grade four in 1998/99. This wastage is estimated to be more than Eth. Birr 186,850,423.00. The 1998 Welfare Monitoring Survey (WMS) also shows that 19.1 percent of the primary school pupils registered in the academic year 1996/97 have dropped out. This situation therefore, calls for a study to understand covariates of primary school pupils attrition and capture policy makers' and planners' attention to reduce this prevailing dropout problem.

This study uses the 1998 WMS data collected by the Ethiopian Central Statistical Authority. The data comprises a sample of 22,787 pupils registered in primary schools during the academic year 1996/97.

The study applies the multivariate logistic regression model to identify some main demographic and socio-economic covariates of attrition. It also investigates differentials in

dropping out of primary schools in Ethiopia, by age, sex, pupil's relationship to the household head, household size, pupil's marital status, distance to the nearest primary school, place of residence, household head's educational attainment, pupil's working status, and household income. Besides, it tries to identify the covariates which most affect dropping out and establishes the magnitude and direction of the effects. Logistic regression analysis is appropriate for the prediction of a binary dependent variable as used in the present study. Preliminary analyses are also made using descriptive statistics.

Six hypotheses regarding primary school pupils attrition were tested in the study. As a result, age-grade mismatch of the pupil, sex of the pupil, household size, urban rural place of residence, household income, and pupil's working status are found to be significant in predicting primary school pupils attrition in Ethiopia. In this study, household size and dropping out of primary schools were found to have inverse relationship, contrary to the general literature.

Although not stated as hypotheses, other covariates included in the study such as, pupil's relation to the household head, pupil's marital status, distance from the household to the nearest primary school, living in some of the regions, and household head's educational attainment were also found significant. Moreover, marital status of the household head, sex of the household head and working status of the household head were found to be statistically insignificant. Pupil's working status, pupil's marital status and Afar region in this order were found to be the three covariates with the strongest effect on primary school pupils attrition.

# CHAPTER ONE

## INTRODUCTION

Our philosophy for the 1990s should be the three Es: Education, Empowerment, Equity. Our motto should be: Education for All and All for Education; Our strategy: more schools-not more arms; Our real goal should be an educated, technically skilled, empowered generation of women and men for the 21<sup>st</sup> century.

(Nafis, 994:53)

### 1.1. Background of the Study

This part presents some highlights of education and development, primary education and demographic phenomena, as well as the need to integrate education, population and development planning.

#### 1.1.1. Education: A Basic Human Right and Building Block of Development

If you are planning for one year, plant rice;  
If you are planning for five years, plant trees;  
If you are planning for the future, educate your children.

(Chinese proverb, UNESCO, 1994:5)

Today's children are tomorrow's citizens and parents of the next generation. Next to survival, food, clothing and shelter education is their greatest need after the age of six or seven. The right to primary education as a basic human right is expressed in the Universal Declaration of

Human Rights and Article 28 of the United Nations Convention on the Rights of the Child (UNICEF, 1963:71; Sweat and Toil of Children, 1998). Without education children can do little when they become adults, to improve their living conditions and to participate in development activities. Education is a major basic force for the advancement of overall development. It can be considered as the most basic building block of development (UNICEF, 1995:19). Investment in education is thus essential for a country's economic and social development. Education leads to the accumulation of human capital, which is key to sustained economic growth. Primary education equips people with the skills of literacy and numeracy and therefore contributes to poverty reduction by increasing labour productivity (Lockheed and Verspoor, 1994; UNDP, 1998:33). This can also be further explained by the fact that education is taken as one of the major components in determining the Human Development Index of a country (UNDP, 2000). Longitudinal studies on 110 developed and developing countries by Bennett covering the period 1938-80 has revealed that primary schooling had a considerable positive effect on their economic development (Bennett, 1985, cited in Lockheed and Verspoor, 1991)

### **1.1.2. Primary Education and Demographic Phenomena**

Besides the fulfilment of basic human rights and its contribution to development, education serves as a bridge towards a slower population growth (UNESCO, 1994:53). Education reduces fertility, improves health, and enables people to participate fully in the economy and in society (UNFPA, 1999:20; Swaminathan and Rawal, 2000:67). Moreover education is observed as a primary determinant in changing the direction of the wealth flow between

generations, which has a contribution to fertility decline. Primary schooling is associated with better health outcomes, and has a positive impact on better infant and child survival. There is a strong correlation between literacy and life expectancy. Especially education of females is identified as the most effective channel for the reduction of fertility and mortality of infants and children (Caldwell, 1986a,b cited in Mahmud, S. and Anne, M.1994:152; UN, 1993:17; UNESCO, 1994:7; UNICEF, 1995:19; Bicego and Ahmed, 1996:33; Bandarage, 1997:174; Swaminathan and Rawal, 2000:67). For instance studies in Kenya demonstrated that 10.9 percent of children born to women with no education die by age five, compared to 7.2 percent of those born to women with primary school education (UNFPA, 2000b:5). The high infant and child mortality in Ethiopia may divulge the need for an effort to promote primary education.

Primary schooling affects fertility in a variety of ways, such as increasing age at first marriage, decreasing the demand for many children, imparting knowledge, attitude and practice of different fertility regulations, empowerment of women, etc. (Psacharopoulos and Woodhall, 1985:295; UN, 1982:49, 1993:17; Bandarage, 1997:174; Menza and Lupien, 1998:166-7; Swaminathan and Rawal, 2000:67; UNFPA, 1999:21, 2000a:8). A study in Sri-Lanka based on 1975 and 1987 different survey data showed that a higher proportion of better educated husbands were also responsible for making family planning decisions because of increasing pressure from their educated wives (Dissanayake, 1996:146-147). A study by UN (1987) in 30 countries has shown a total fertility rate (TFR) of 6.9 in women with no education, compared to 3 in women with seven or more years of schooling. Many other studies show that education about reproductive and sexual health contributes to the postponement of sexual activity and to

the use of contraception among sexually active teenagers (UNFPA, 2000b: 9). Therefore, failure to educate people is failure to reduce population growth and its pressure on development (UNESCO, 1994:53, UNICEF, 1995:19). Education is also a means to overcome the major threat of HIV/AIDS to public health problem (UNFPA, 1999:24). Thus, it can be seen that education in general and primary education in particular plays a critical role in demographic transition (Swaminathan and Rawal, 2000:67).

In Ethiopia, the social demand for education is increasing from time to time along with the accelerating growth of population. However, to spread educational opportunities to the population and to attain the objective of meeting universal education by the year 2015 in face of such unprecedented accelerating population growth would seem to be a white elephant. In order to reduce this unprecedented population growth to a nearly optimal position and to facilitate social mobility, tireless efforts have to be made not only to enrol the school age population in schools, but also to keep them in schools until they attain the desired outcomes.

### **1.1.3. Integration of Education, Population and Development Planning**

Pressure for access to and success of primary education is an indication of the desire for change and progress of a nation and should be taken into account in defining national objectives and priorities. Therefore, educational planning has to be considered as a part of planning for the overall development strategies of a country (Ekanem and Arowolo, 1994:59). Furthermore, careful planning and long-term commitment has to be made to enhance the place of education in population and national development. In order to integrate education into

population and development, policy makers and planners need to have knowledge of the demographic aspects of educational planning.

An educational planner has to have knowledge of population structure and its effects on education (Chau, 1969:12). An accurate knowledge of the distribution of the population by age and sex enables the planner to measure the relative size and growth of the school-age population. This is obviously the foundation, and the point of departure for any educational policy formulation, for determining educational requirements, and for setting strategies of implementation.

In relation to the population growth components, fertility change greatly affects the potential size of the school age population. Fertility is the most important determinant of the shape of the age/sex structure. High fertility leads to young age structure (Weeks, 1989:252). The size reduces as a result of fertility decline and thereby pressure on educational needs weakens. Trends and levels of infant and child mortality also influence the size (Ekanem and Arowolo,1994:58-59). To estimate manpower requirements and to integrate education and the labour market, by setting targets for different levels of education, an accurate knowledge of the distribution of the population by industries and occupations is also essential. The spatial distribution of the population also affects costs of education, types, sizes, concentration and location of schools as well as the type of educational facilities to be provided. All of these affect the preferences and attitudes of pupils and parents towards education and have a significant role in the performance of the education system.

Knowledge of the patterns of internal migration, especially the size of families and the number of school age children migrating with them, is another essential aspect for providing educational services.

Other aspects of educational planning in which population dynamics should be taken into account are the use of mass communication media in education, the integration of education and environmental needs, instruction in population related subjects in the primary level in particular and in other levels in general (Chau, 1969:12).

## **1.2. Background of the Study Area**

In this part Ethiopia's demographic and socio-economic profiles including a brief history of its education systems are outlined.

### **1.2.1. An Overview of the Demographic and Socio-economic Profile of Ethiopia**

Ethiopia is a country of Eastern Africa with area of 1.112 million square km (which is three times of Germany or France and Spain put together). It is situated approximately at 39°E and 8.5°N. Djibouti and Somalia (on the East and Southeast), The Sudan (on the West), Eritrea (on the North), and Kenya (on the South), are its borders (Figure 1.1). It has a history of government as far back as 2000 years since the beginning of the Axumite kingdom. The country is divided into nine federal states and two city councils.

The total population of Ethiopia in 2000 AD as projected from the 1994 Population and Housing Census result was about 63.5 million, 49.8 percent of which were females. About 85 percent of the total population (about 54.022 million) live in rural areas and their livelihood depends on agriculture (CSA, 1998:331). For the years 1995-2000, population growth rate was 2.5 percent compared with 0.3 percent of the developed regions, total fertility rate was 6.3 children per woman, compared with 1.57 of the developed regions, and maternal mortality ratio was 1,400 per 100,000 (UNFPA, 1999:70). In 1995, estimated infant mortality was between 112 and 120 per 1,000 live births compared with 92 for Sub Saharan Africa (World Bank, 1998:67). Mean age of marriage among males and females was 23.9 and 18.1 respectively. Proportion of children under 5 years of age in total population was 19.2 percent; proportion of elderly persons aged 60+ in total population 4.6 percent, and proportion of persons with disability in total population was 3.8 percent. Life expectancy at birth for males was 51, for females 53, and for both sexes it was 52 years (CSA, 1998:328, 329,).

Orthodox and Islam are the major religions. More than 80 languages are spoken in the country and among the languages Amharic is the working language of the Federal Government. Amharic has been the language of administration since the 14th century. According to the new Ethiopian constitution, nations and nationalities are entitled by law to adopt their own languages for official use as well as a medium of instruction of primary education in their respective administrative regions.

Ethiopia's economy is predominantly agricultural, that accounts for 50 percent of the country's GDP. The overall contribution of industrial manufacturing (10 percent) and services sectors to

the GDP is 50 percent (UNDP, 1998:25). It is estimated that 65 percent of the country's total area is arable with excellent fertility. But the land currently under cultivation is only 15 percent. With respect to animal resources, Ethiopia ranks first in Africa and tenth in the world. Even then, with estimated GDP per capita of US\$ 110 a year, Ethiopia is one of the poorest countries in the world that has some of the worst social and economic indicators in Africa (UNDP, 1998:65).

### **1.1.2. A Brief Historical Profile of the Ethiopian Education System**

Ethiopia was not colonised by any foreign power and has a history of education since the introduction of Christianity in the 4<sup>th</sup> century. But it has suffered from repeated foreign invasions and internal unrest throughout its age in the past, which is one of the main reasons for slow progress in the education system.

Ethiopia's formal education system can be investigated in terms of six distinctive historical events characterised by unique sets of goals, problems and challenges.

The first which started after the introduction of Christianity in the fourth century and which was dominant for many centuries is the religious church education. During this period, the church had a virtual monopoly over the education system of the country (Tekeste, 1996:1).

The second is the system of education that began during the early part of the 20<sup>th</sup> century, and which introduced secular public education. It is said that, there was a strong resistance by the church against the introduction of modern education to Ethiopia. However, Emperor Menilik

II (who ruled Ethiopia from 1889 to 1913), handled the church smoothly and communicated with the external world properly so that the establishment of this secular education system was possible. In order to reduce church opposition against secular education, teachers from the Egypt Coptic Church were brought to Ethiopia. Thereafter, other missionaries came to Ethiopia as teachers little by little. This secular public education system was destroyed by the Fascist Italian invasion lead by Bonito Mussolini in 1935.

The invasion of Ethiopia and distraction of its secular education system, led to the third education system that consisted of a pro-Italian curriculum. Although, this system of education did not last long its reflections were observed in the next educational system.

The fourth system of education was introduced after the restoration of the national government of Ethiopia in 1941, and lasted up to 1973. During this time, the education system was restructured from primary to college levels. In the 1950s, the Americans were involved in shaping the Ethiopian educational policy through an advisory group assimilated into The Long Term Planning Committee under the vice-minister of education (Tekeste, 1996:104). In 1961, the UNESCO sponsored Addis Ababa Conference on African Education was optimistic and targeted Ethiopia's achievement of universal literacy by the year 1980. However, this optimistic vision and target was not successful and review of the education system was found to be crucial. In 1971 the Education Sector Review (ESR) commission comprising of more than 80 outstanding Ethiopian and international educators operating with the co-operation and financial assistance of many international and bilateral organisations was formed to examine the whole educational establishment of the country. During this time Ato Seifu

Mahtemeselassie was minister of education and Dr. Abebe Ambachew was the director of the ESR. The commission presented its report and recommendations to the Ministry of Education and to the Emperor in 1972. The report pointed out that the educational system was unacceptably narrow, elitist, expensive, inefficient, and discriminatory. It further identified that many pupils dropout of schools without attaining employable skills. Thus, the report recommended the restructuring of the whole system, so that, before the end of the twentieth century, 95 percent of all school age children would complete basic education and then participate in some of the community skill development centres, which were to be established in rural and urban centres under the auspices of the relevant government ministries (Ministry of Education and Fine Arts: 1972). However the military government took state power before the results and recommendations were publicised and applied.

Thus the fifth educational system following the establishment of the "socialist" military government that lasted from 1974-1991 was put into effect under the domination of "socialist" ideology. The aims of Ethiopian socialist education during this period had their foundation in the 1976 Programme of the National Democratic Revolution, as well as The Directives of Ethiopian Education of 1980. During this period, the structure of the Ethiopian education was divided into primary (Grades 1-6), junior secondary (Grades 7-8), senior secondary (Grades 9-12) and tertiary levels. The National Literacy Campaign Co-ordinating Committee was established in 1979 and was successful in spreading literacy among the population, that literacy rate increased from 7 percent in 1975 to 63 percent in 1983. Moreover in 1983, the Ministry of Education initiated a project called The Evaluative Research on the General Education System of Ethiopia (ERGESE) on the basis of the resolution passed by the

government. The report of this research project identified that there were high dropout rates at grade one and at grade six in addition to other problems of the system (MOE: 1986).

The sixth educational system is the present system that was established on the basis of the new education and training policy of the country, that followed the fall of the military government in May 1991 and the educational reform of 1994 (Transitional Government of Ethiopia, 1994). According to this system educational decision making is decentralised in the sense that more responsibilities and decision-making autonomies are given to the regional education bureaux. Furthermore the policy encourages the rights of nations and nationalities to promote the use of their languages. In other words, the policy encourages the child to learn in her/his mother tongue at the primary level of schooling. The present structure comprises primary (Grades 1-8), secondary (Grades 9-12) and tertiary levels. Primary education is further divided into first cycle or lower primary (Grades 1-4) and second cycle or upper primary (Grades 5-8). Secondary school education is also further divided into first cycle secondary or lower secondary (Grades 9-10) and second cycle secondary or upper secondary (Grades 11-12).

This shows that the goals of education have shifted from time to time depending on how the needs were perceived by those in power.

At present significant attempts and efforts are being made to address the pressing need for education and to provide educational opportunities at different levels. The allocation of a large proportion of the public budget to education and the formulation and implementation of the Education Sector Development Program (ESDP for the period 1997-2001) are good evidences to this fact. For instance, public expenditure on education increased from 1,387.87 million

Ethiopian Birr in fiscal year 1995/96 to 2,303.84 million Ethiopian Birr in 1999/2000. Moreover, during the same period, the number of primary schools increased from 9,847 to 11,490 and primary school enrolment increased from 3,787,919 to 6,462,503 (MOE, 2000: 32-33).

In 1998 literacy and numeracy rates for population aged 10 years and over were about 27 percent and 86 percent (of the literate) respectively for both sexes. There was no wide gap in numeracy between males and females (85 percent and 90 percent respectively). But the gap in literacy rate was very wide (36 percent for males and 17 percent for females). Moreover literacy rates in urban and rural areas were 69 percent and 19 percent respectively (CSA, 1998:71). Similar disparity was observed regarding school enrolment at different levels. This shows that, females compared to males, and rural areas compared to urban areas are disadvantaged. Computations based on the 1994 Population and Housing Census results also ascertain the urban-rural, and gender disparity of adult literacy rates in all regions of Ethiopia. The same was true for primary gross enrolment ratios, except for Harari and Addis Ababa, where female primary gross enrolment ratios were higher than that of males (UNDP, 1998:73).

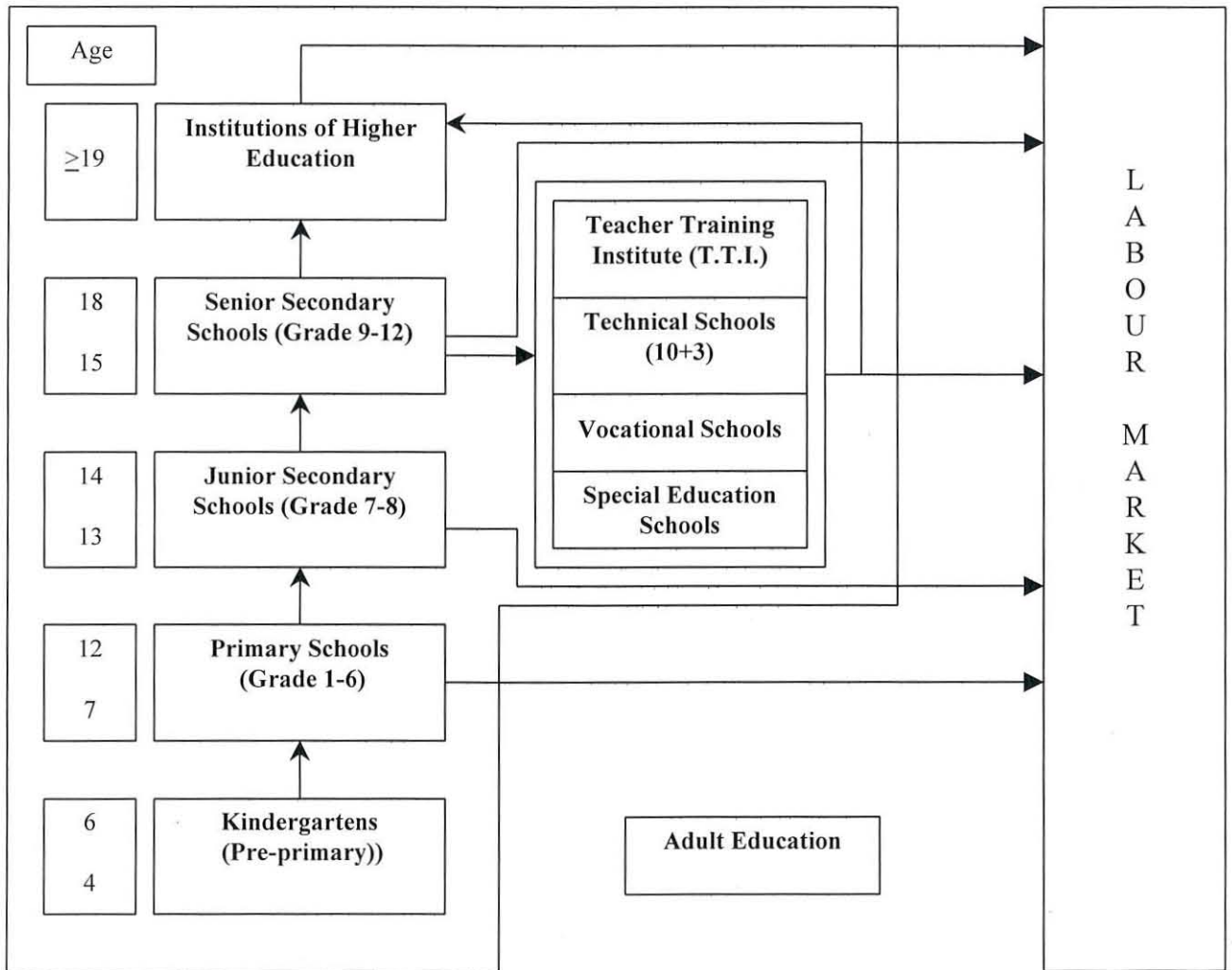
Projections based on the 1994 Ethiopian Population and Housing Census reveal that in the year 2000, there were about 12,883,000 primary school age children (aged 7-14) of which about 49 percent (6,337,000) were females (CSA, 1998:353). Depending on these projections, primary school gross and net enrolment ratios in 1999/2000 were found to be 51 and 44 respectively (MOE, 2000). This shows a radical change compared to that of 1998/99 where GER and NER were 45.8 and 39.6 respectively. But, if the projections are assumed to hold, it

also means that, out of the 12,883,000 primary school age children only 44 percent were enrolled in school out of which, many might have dropped out.

From the above discussion, we have seen the importance of primary education as a basic human right, its role in development, its contribution to demographic transition, the importance of demography in educational planning and the slow progress of education in Ethiopia. In the next section, the extent and magnitude of primary school pupils' attrition problem in Ethiopia and the need to study the causes are presented.



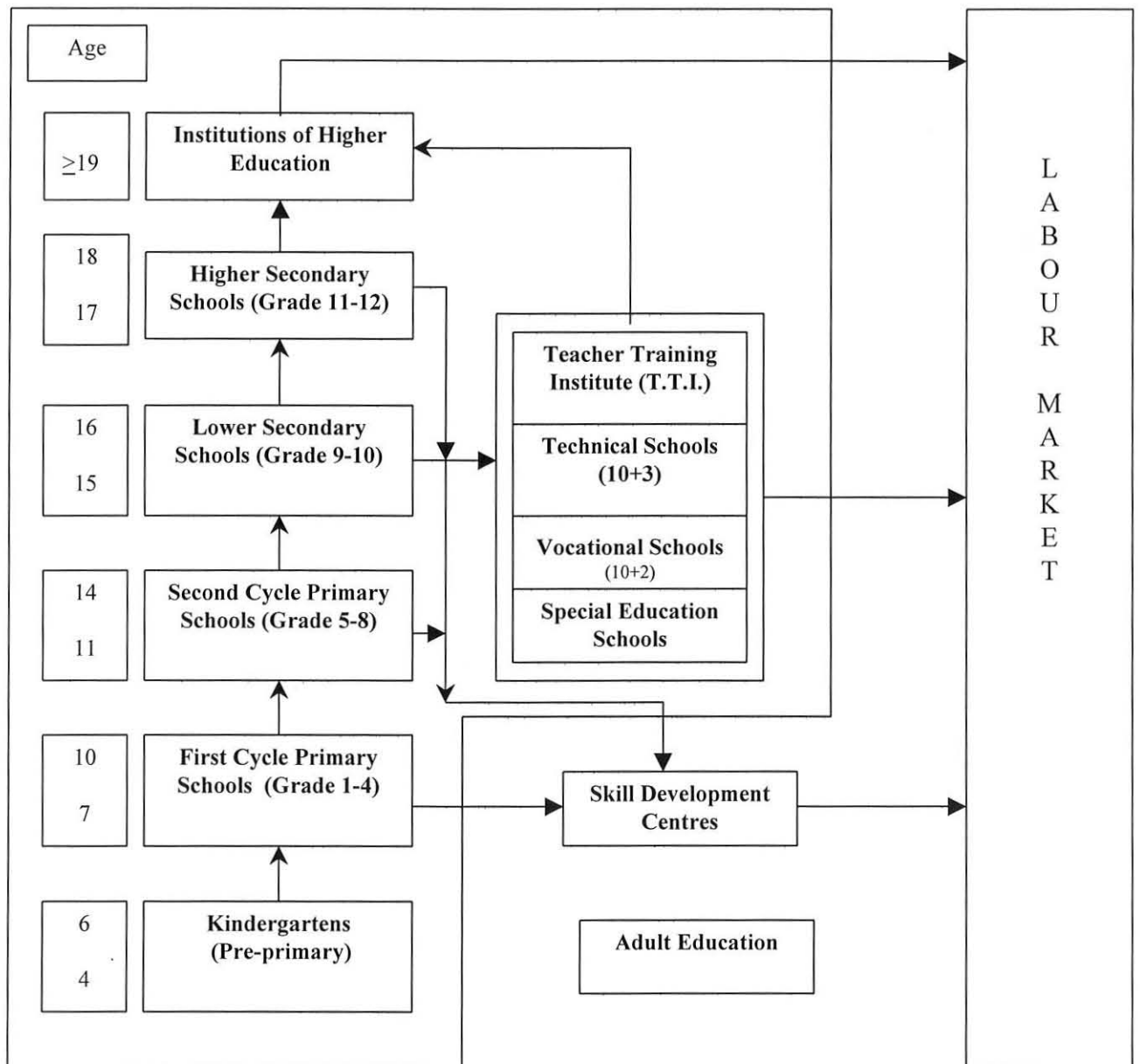
Figure 1.2. Structure of the former Ethiopian Education System (Before 1994)



Source: Modified from Berhan (1996)

DOCUMENTATION CENTRE  
 INSTITUTE OF DEVELOPMENT RESEARCH  
 ADDIS ABABA UNIVERSITY  
 P. O. Box 1176, ADDIS ABABA  
 ETHIOPIA

Figure 1.3. Structure of the new Ethiopian Education System (Since 1994)



Source: Modified from Berhan (1996)

### 1.3. Statement of the Problem

A year of schooling typically shows a 25 to 30 percent real rate of return, which appears noticeably better than that of other investment alternatives.  
(Hanushek, 1995:236)

Educational goals are usually expressed in terms of required output by level and type of education. But it is important to evaluate the overall performance of the system with the help of different input, process, output, and outcome indicators in relation to predetermined goals and objectives. If the system fails to attain its pre-determined objectives and hence its goals, we can say that there is educational wastage. The cases of pupil attrition and repetition are two of the most common aspects of educational wastage in many developing countries. Grade repetition and high attrition rates lead to a significant waste of resources in many school systems (Hanushek, 1995:227). Despite a large number of entrants to the school system in developing countries, fewer than 60 percent of the children who enter school in the low-income countries and about 70 percent of those who enter school in the lower-middle-income countries reach terminal of the primary cycle. In the poorest countries, primary school completion rates declined during the last decade due to high rates of early attrition (Lockheed and Verspoor, 1994:11). For example children in the North Atlantic countries have 100 percent opportunity to complete primary education whereas less than 10 percent of Ethiopians have that opportunity (Tekeste, 1996:8). In fact very less than the above percentages reach the terminal of the secondary school and similarly, a very low number of pupils enter and reach the terminal of tertiary education. This problem has a considerable effect on individuals and

society at large. Individual primary school dropouts suffer from migration, early marriage, child labour and their consequences, which in turn affect the society. These may result in higher population growth, lower potential labour productivity, higher potential unemployment, lower tax revenues, economic instability, bigger number of crime records, poorer levels of health, and other demographic, political and socio-economic problems. Ultimately these consequences show the failure and crises of the education system and they explain wastage in human learning (Levy, 1971:44). In some countries as much as 25 percent of the education budget is spent on pupils who drop out before reaching grade four in their education (Poostchi, 1986:307). Dropouts are considered as a waste, because each school cycle is taken as a logical entity, which should be attended in its totality if the pupil is to reach a certain level of competency. Learning is a continuous process, and we cannot say that a pupil, who drops out just before the end of a cycle, has learned the basic skills (reading, writing, and arithmetic) which cannot be assimilated in less than some minimum time spent in primary education. Furthermore, schools do much for pupils other than transmit new knowledge. They play an important role in shaping children's attitudes and in transmitting social values (Eicher, 1984:114).

In Ethiopia besides the low gross enrolment ratio (GER), net enrolment ratio (NER), and high gender disparity of enrolment, the system is confronted with educational wastage due to pupils attrition. For the school year 1999/2000, primary school GER was 51 (60.9 for males and 40.7 for females), and primary school NER was 44 (51.2 for males and 36.6 for females). These figures also show the gender gaps in GER and NER of 20.2 and 14.6 respectively (MOE, 2000:22).

Primary school pupils attrition has remained a problem in Ethiopia since the inception of modern education in 1906 (Tadesse, 1975:30). This shows that the problem is not a new phenomenon in the country. For instance in the academic year 1968/69, out of the sample of 3140 rural pupil dropouts taken for a study by Tadesse (1975), 3103 were from grades 1-4. The total cost in school resources to the government from these 3,103 rural pupils who dropped out of the school system during the academic year was US \$766,235. Thus, even though it is possible to reduce the magnitude, the problem will remain unsolved as long as there are schools and barriers of schooling.

During the period (1994/95-1998/99) primary school (grades1-8) attrition rates for both girls and boys have shown an increase. The overall rate has risen from 13.77 in 1994/95 to 18.94 in 1998/99. For girls the rate increased from 13.78 in 1994/95 to 17.50 in 1998/99. For boys the respective figures were 13.77 and 19.82 in the same period (MOE, 1999c:53; 2000:98). Compared to other grade levels, the highest attrition rate during the academic period 1994/95-1998/99 was observed at grade one. The gap between grade one urban and rural attrition rates is also wide. It is higher in rural areas compared to the urban areas. The average difference between rural and urban attrition rates during the period 1994/95 – 1997/98 was 16.55. Reports from the Ethiopian ministry of Education also reveal that, at national level 30.3 percent of pupils enrolled in grade one in the academic year 1998/99 (1991 E.C) have dropped out from school before reaching grade two (MOE, 2000:13).

In 1994/95 there were 1,107,751 pupils enrolled in grade one, out of which only 433,094 pupils completed fourth grade (the terminal grade of the first cycle of primary school) in

1998/99 (MOE, 1995, 2000). This reveals the fact that only about 39 percent of the primary school pupils in Ethiopia completed the terminal grade of the first cycle primary education in 1998/99. The total number of repeaters in grades 1-4 (detained at each grade every year out of the original cohort during the period 1994/95 – 1997/98) was 217,810. Thus, out of the original real cohort of 1,107,751 pupils enrolled in grade one in 1994/95,  $1,107,751 - (433,094 + 217,810) = (1,107,751 - 650,904) = 456,847$  pupils (41.2 percent of the original real cohort) dropped out of the system during the given four years (MOE, 1996:15, 1999c:41).

In 1996 the annual public expenditure per pupil of Ethiopian primary school education was Ethiopian Birr 409.00 (PHRD, 1996b: 121). If we assume that this per pupil expenditure applies for the period 1994/95-1999/200, the total amount of estimated wastage due to attrition from the first cycle primary schools during the four years was more than Birr  $409.00 \times 456,847$  pupils = Birr 186,850,423.00. This wastage does not include expenditure on repeaters and other psychological and opportunity costs. Besides this, it can be observed that every four years, 456,847 children leaving the system may be confronted to different, demographic and socio-economic problems, and they may become problems to the country as a whole. Many of them may join the unskilled labour, the unemployed section of the society, or children may suffer from child labour and early marriage, although primary education is one of the most effective instruments for stopping child labour and early marriage (Sweat and Toil of Children, 1998). Those dropping out of rural schools may also migrate to urban areas and suffer from the problems rural migrants face in the urban areas. These problems are worse for females than males. Young female children migrating from rural to urban centres take a job as housemaids in the beginning and later drift into prostitution as the only way of making a living. For

Therefore, the purpose of this study is to make an analysis of the demographic and socio-economic covariates of primary school pupils attrition in Ethiopia and to suggest strategies for effective prevention of the problem, as it is better and easier to build the children than to repair adults.

## **1.4. Review of Related Literature**

### **1.4.1. A Review of Primary School Enrolment and Attrition Situation in Some Developing Countries**

The problem of attrition is one of the serious challenges that educational systems of most developing countries have to face. Low pupil achievement and low completion rates are the most visible signs of ineffective primary education systems (World Bank, 1990:11). In many countries, even in those where primary enrolment ratios appear to be high, many children who are enrolled in school are not actually attending. For instance, Mexico and the Philippines both reported net primary school enrolment rates of 100 percent. But in Mexico 84 percent of enrolled primary school children do not reach grade five and some 1.5 to two million children between the ages of six and 14 are either not regularly attending school or have dropped out (UNICEF, 1998, cited in *Sweat and Toil of Children*, 1998). In the Philippines, only 70 percent of enrolled primary school children reach grade five, and a 1995 attendance survey found only 89 percent of primary school-age children actually attending school (UNICEF, 1999, cited in *Sweat and Toil of Children*). In Brazil, the primary school enrolment ratio in 1994 was 90 percent. But only 71 percent of enrolled primary school children reach grade five,

and a 1995 household survey indicated that approximately five million children of ages five to 14 years old (or 15 percent of the children in the age group) were not attending schools (Sweat and Toil of Children, 1998). Turkey's net primary school enrolment ratio in 1994 was 96 percent. But only 89 percent of those enrolled reach grade five, and a 1993 survey found that only 73 percent of six to ten years old children were attending school (UNESCO, 1998; UNICEF, 1999, cited in Sweat and Toil of Children, 1998). In Peru, more than 200,000 children on average dropout of primary school every year. In Nepal, Nicaragua and Pakistan, about half of enrolled primary school children leave school before the fifth grade (UNICEF, 1999:108). In Guatemala, only 30 percent of pupils enrolled complete primary school (Desarrollo Social y Construction de lapaz 1996, cited in Sweat and Toil of Children, 1998). In Bangladesh, 61 percent of children completed primary school in 1995 (Primary and Mass Education Division, Government of The People's Republic of Bangladesh, 1996:6, cited in Sweat and Toil of Children, 1998). In Indonesia until the 1980s, one of the most serious challenges educators had to face was the attrition problem. At the time the First Five Years National Development Plan was formulated in 1967-1968, two symptoms of inefficiency in the elementary school system were the high attrition and repeater rates. In 1971 an estimated 67 percent of the pupils who entered first grade before six years have dropped out before graduating from grade six. Of all the children who had entered grade one in 1972, only 48 percent graduated from grade six in 1978 (Soedijarto, et al., 1980:77).

## **1.4.2. A Review of Factors Associated with Primary School Pupils Attrition**

Many studies have been conducted to identify the factors associated with primary school pupil attrition. A review of related available studies is made here.

### **1.4.2.1. Demographic Factors**

Sex, age, family size, mortality (death of one or both parents), place of residence, early marriage, and pregnancy are some of the demographic factors that can force children to drop out of school (Brimer and Paul, 1971; Levy, 1971:52; Hughe, 1973; Tadesse, 1975; Sarkar, 1983; World Bank, 1990; Wanna and Tsion, 1994:75-76; Gardner, 1998:16; UNFPA, 2000a:9).

Studies made in Taiwan, Singapore, and Hong Kong have shown that earlier born girls typically leave school earlier than their brothers, because parents in those cultures prefer their sons to advance educationally to support them in their old ages and their daughters to serve them in different ways before marrying (Salaff, 1981; Greenhalgh, 1985, cited in Sudha, 1997:141-142). It was also found that for boys the best schooling situation is to have older sisters, and for girls the worst is having younger brothers (Tang, 1981, cited in Sudha, 1997:142). In a study by Lloyd and Ann, (1993:274), delayed entry into school and repetition were found to be significant contributors of dropping out of primary schools in Malawi and Cameroon.

Of the 115-145 million school age children out of school in developing countries, the vast majority come from one or more of the traditionally disadvantaged groups in society: rural, female and the poor. Urban children are more likely to enrol in and complete primary school than rural children do. In rural areas of most countries, less than 50 percent of children and as few as 10 percent in many countries, complete more than four grades of schooling. In low-income countries less than two-thirds of those who enrol in primary school complete the entire cycle (World Bank, 1990:11, 33; Lloyd and Ann, 1993:291).

Female rural migrant dropouts are exposed to many urban problems. For many of them prostitution is the only available job for their survival. For instance as it was cited earlier, there were more than 37,000 prostitutes in Ethiopia (UNICEF, 1984). A number of studies in Asia also show that there are one million girls under the age of 18 involved in prostitution (UNICEF, 1995:34).

DHS studies conducted in Indonesia and Nepal, have confirmed marriage as an important reason for stopping primary school education (Gardner, 1998:16). Studies conducted in India also reveal that late age of admission to school and early marriage are responsible for high attrition rates of primary school (Sarkar, 1983:28).

For many girls from different countries, pregnancy becomes the end of formal education, since they drop out of schools. In Kenya alone, about 10,000 girls drop out of school and many others do so to care for their new babies. If married, they drop out to meet their husbands' demand (UNFPA, 2000a:9). A logistic regression analysis result of a study based on a sample of survey data in Botswana, also indicated that 12 percent of female pupils dropped out of

primary schools as a result of pregnancy. This likelihood was found to be significantly higher for older cohorts (Meekers, D. and G. Ahmed, 1999:198-202). Pupils from a single parent family are also exposed to the problem of dropping out of school (Steinberg, et al. 1984).

According to a study of primary school pupils attrition in developing countries by Levy, higher crude fertility rates were found to be associated with high attrition rates (Levy, 1971:52). This shows that large family size may increase a child's probability to drop out of school. On the other hand, a study in seven sub-Saharan Africa countries (Kenya, Tanzania, Cameroon, Niger, Malawi, Namibia, and Zambia), by Lloyd and Ann, (1993:285) used multivariate logistic regression analysis and has shown that the presence of other school-age children who can share in household tasks has a contribution to the staying-in of first cycle primary pupils. Another study in Kenya by Gomes (1984: 655) also found that, large family size tended to be positively related to educational attainment.

#### **1.4.2.2. Socio-economic Factors**

Parents low educational attainment, low health status, parents doubt of the outcome of education, poverty, direct and indirect costs of education, child labour (economic value of children), occupation of parents, low family income, and low nutritional status, are some of the important socio-economic and health factors associated with dropping out of primary schooling in most of the developing countries.

Education of parents plays an important role in preventing their children from dropping out of schools. Children of the educated are more likely to enrol in school and to complete more

Low family income is one of the main determinants of dropping out (Eicher 1984:115-116). Children of poor families are less likely to enrol in school and more likely to drop out of school, than children of better-off families. A study on India and Nepal found that pupil enrolment in the richest families exceeded that of the poorest by 50-100 percent. In Egypt, cost of schooling was the reason most often cited in parents for not sending their children to school (World Bank, 1990:34). Another study in the seven sub-Saharan Africa countries mentioned earlier except Niger by Lloyd and Ann (1993:284), based on logistic regression analysis depicted that pupils from households with higher standard of living were more likely to stay-in compared to those from households with lower standard of living.

Studies made in Indonesia show that the high attrition rates seemed to be the result of a combination of factors. In some cases, children found schooling difficult and uninteresting, so they urged their parents to let them stay at home. Parents who found their children of use in the family workforce either encouraged or permitted them to drop out. A further cause was the financial burden on the family; although elementary schooling was free, in reality there were costs to be met, usually for school fees as well as for books and clothing and some times transportation. A family with a small income and six or eight children of school age found the expenses often too burdensome to bear, so children stopped attending after two or three years. Another reason was the questionable value of full elementary schooling for the job market (Soedijarto, et. al, 1980:77). Children's capacity and interest for staying in school and for learning is also largely determined by their health, nutritional status and prior learning (World Bank, 1990:22).

ILO (1998, cited in *Sweat and Toil of Children*, 1998) estimated that there are more than 250 million working children between the ages of five and 14 in developing countries. The majority of the world's working children are found in Asia (61 percent) followed by Africa (32 percent). In Africa 41 percent of the children between ages five and 14 are working (ILO, 1998, cited in *Sweat and Toil of Children*, 1998). A study made in 16 countries by *Sweat and Toil of Children* (1998) identified that work is one factor that can constitute a major impediment to children's attendance and successful completion of primary education. According to this study, working children have low enrolment and high absenteeism and attrition rates. This may be attributable to fatigue from long hours of labour, injuries and illnesses, and work schedules that conflict with school hours. High absenteeism and dropping out are particularly chronic among working children in rural areas (*Sweat and Toil of Children*, 1998). Facts and figures regarding experiences from the 16 individual countries on the basis of the study by *Sweat and Toil* (1998) mentioned earlier also show the extent of the effect of child labour on dropping out of schools.

In Brazil, 13 percent (2.3 million) of children aged 10 to 14 years were found to be both working and attending school in 1995. About four percent (721,113 children) in the same age group worked full time and did not attend school (UNICEF, 1997: 136, 138; cited in *Sweat and Toil of Children*, 1998). In 1997 a survey conducted in the rural citrus-producing region in the State of Sergipe found that about 33 percent of working children (1,649 children) were not attending school. About 20 percent of working children aged 10-14, were illiterate compared with only eight percent of non-working children in the same age group (Presidencia da Republica, Camara de Politica Social, 1997:75, cited in *Sweat and Toil of Children*, 1998). In

Mexico, a 1996 study found that almost 19 percent of Mexican children aged 12 to 14 years were working and not attending school (Instituto Nacional de Estadística, Geografía e Informática, 1998:65, cited in *Sweat and Toil of Children*, 1998). School attendance among this age group was found to be higher in urban areas (87.3 percent compared with 64.7 percent) (Instituto Nacional de Estadística, Geografía e Informática, 1998:63, cited in *Sweat and Toil of Children*, 1998). In Peru, only a third of all working children and adolescents aged six to 17 years attended school in 1993. On the other hand 85 percent of non-working children in the same age group attended school (Mejores escuelas, 1996, cited in *Sweat and Toil of Children*, 1998). Moreover working children's attendance rates were substantially higher in urban areas than in rural areas. In rural areas only one of every five working children attended school. Attrition rates among working children of age six to 14 years were 47 percent, compared to eight percent for non-working children of the age group (GIN, 1997, cited in *Sweat and Toil of Children*, 1998). In South Africa, 17 percent of 14-year-old child labourers in farming areas have no school credentials, compared to 10 percent for children who are not working (Dawie B. and Adele G., 1996, cited in *Sweat and Toil of Children*, 1998).

#### **1.4.3. A Review of related studies on the Ethiopian context**

Although many studies have been conducted regarding different problem areas of the Ethiopian education, the problem of primary school pupils attrition seems to have been limited, because comprehensive studies made so far in this regard are either not many or not recent ones.

Tadesse (1975) did the first comprehensive study on Ethiopian rural primary school dropouts. According to this study, dropping out of rural primary schools was found to be dependent upon family size, parents' educational level, and occupation. That is, pupils coming from large family size, uneducated parents, lower economic status, and farming background were more likely to drop out of primary schools.

Wanna and Tsion (1994:75-76) conducted a sample survey study and applied Chi-square test of independence to test several hypotheses regarding primary school female pupils in Ethiopia. In this study they found that family size, parents educational level, early marriage, and parents' doubt of the outcome from education were positively related to dropping out of primary schooling.

A study by Yelfign, et al, (1995), in six primary schools of Cheha district (Gurage zone) has shown that girls from educated mothers and from parents who are willing to buy stationery materials and clothing have better chances to continue schooling. This study has further shown that dropping out was more prevalent among older cohorts of both females and males.

A sample survey conducted by The Policy and Human Resource Development Project (PHRD) in 30 communities, 60 groups, 90 households and 300 interviewees from all regions of Ethiopia revealed that girls drop out of schools for various reasons. The major ones were, cultural influence, family support, early-marriage, fear of violence, rape, and long distance from home to school. For boys the most important reasons for dropping out of school were to support family and to seek employment. Sickness and family displacements were also reported as reasons (PHRD, 1996a). This survey further found that heads of households cited poverty

and health problems, as the main hindrances for children especially for girls to access to education and for dropping out of schools.

In 1997, Darge used the 1993/94 data on primary school pupil dropouts and applied stepwise multiple regression analysis. His findings reveal that in all regions and among both sexes, parents' literacy has a reliable impact on reducing dropping out (Darge, 1997:530).

## **1.5. Objectives of the Study**

On the basis of the review of related literature and the existing dropout situation in the country, the following general and specific objectives are stated.

### **1.5.1. General Objective**

The general objective of the study is to identify some main demographic and socio-economic differential and covariates of primary school pupils attrition in Ethiopia with reference to the academic year 1996/97.

### **1.5.2. Specific Objectives**

The specific objectives of the study are:

1. To identify differentials in attrition problem by age, sex, grade level, place of residence etc.
2. To identify the factors which most affect primary school pupil attrition in Ethiopia with reference to the year 1996/97.

## 1.6. The Study Hypotheses

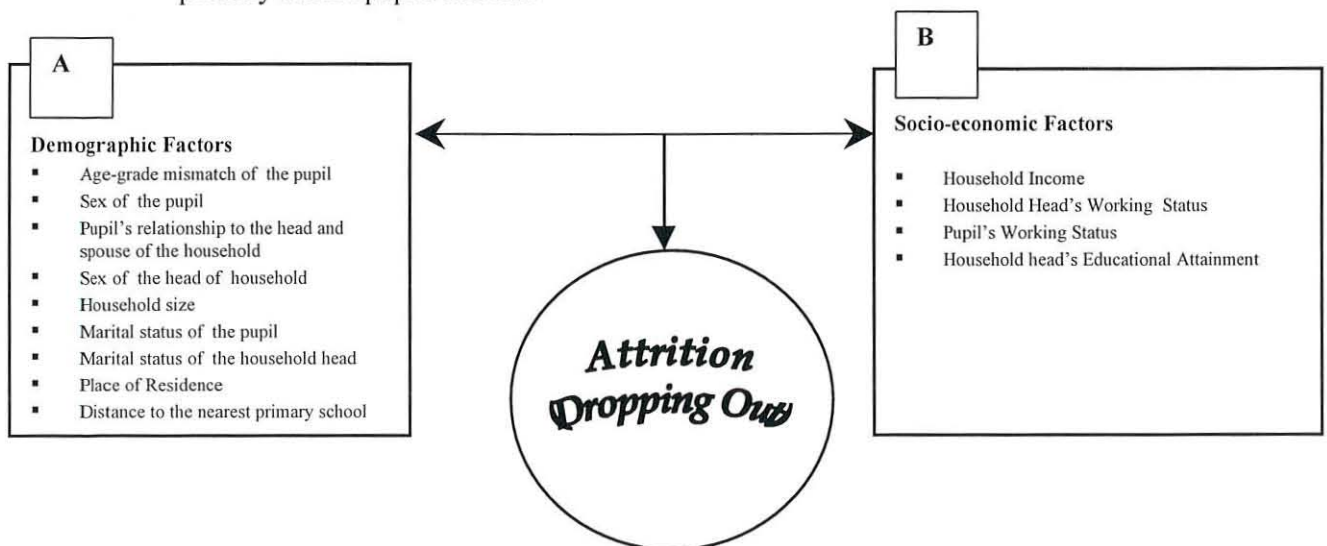
To accomplish the specific objectives stated above, the following main hypotheses are tested in the study.

1. Pupils with age-grade mismatch are more likely to drop out of primary schools than those of the appropriate primary school age.
2. Females are more likely to dropout of primary schools than males.
3. The larger the household size, the higher would be the likelihood of pupils to drop out of primary schools.
4. Pupils from rural households are more likely to drop out of primary schools, compared to those from urban households.
5. Working children are more likely to drop out of primary school than non-working children.
6. The lower the household income the higher is the likelihood of dropping out of primary schools.

## 1.7. The Conceptual Framework

The conceptual framework given in Figure 1.4 explains different interacting demographic and socio-economic factors operating in social dynamics and contributing to primary school pupils' attrition rates. The demographic factors in box A, and socio-economic factors in box B, employed in the analysis, are assumed to directly affect attrition/dropping out. Primary school pupils' attrition leads to a combination of demographic and socio-economic consequences such as child labour, early marriage, migration, illiteracy, unskilled labour, unemployment, low labour productivity, etc., leading to poverty. Thus, improving A and B reduces primary school pupils' attrition rate and this reduces the consequences. Although, many demographic and socio-economic factors other than those given in boxes A and B such as mother's educational and occupational status, ethnicity, religion, language, etc. as well as school factors, may directly or indirectly affect primary school pupils' attrition, these are the only variables included in this study.

Figure 1.4. The Conceptual framework showing the inter relationship of the factors which affect primary school pupils' attrition



Source: Developed by the author

## 1.8. Significance of the Study

Civilisation, it was once said, a race between education and  
Catastrophe—and we intend to win that race for Education.  
(Kennedy, 1963:896)

At present Ethiopia is moving towards a market based economy where large-scale development projects and investments are underway. For the implementation, management and co-ordination of the development activities, education and training at primary, secondary, vocational and higher levels are not only necessary but also vital. Thus the education system plays a very important role in development as mentioned earlier.

A building without a strong foundation hardly lasts long. Similarly, if the foundation of an educational system is not strong, it may face serious problems in its higher levels. Primary education is the foundation of all other levels of the educational system and determines the student flows in the whole system. If the foundation of the educational system is taken care of, it can serve as a strong springboard for all other levels. As the primary education system develops strong in coverage, equity, effectiveness, and efficiency, further attention can be devoted to the other levels of the system. A poor system of primary education compromises the entire system of human capital development (Lockheed and Verspoor, 1994:17). For instance, studies have shown that primary education is the largest single contributor to the economic growth rates of the high-performing Asian economies. In the newly industrialised economies such as Hong Kong, Israel, Japan, Korea, and Singapore, universal or nearly universal primary enrolment was achieved just before rapid economic growth (World Bank

1990:11). In fact this achievement must have been followed by a reasonable holding power of the schools to meet their objectives.

Investment in education continues to be a very attractive investment opportunity in the world- both from the private and the social point of view. Especially, investment in the education of girls provides the highest return, and is regarded as the best single investment available in the developing world (Psacharopoulos, 1994, Hanushek, 1995:236). Moreover, recent researches and empirical findings show that educating females yields far-reaching benefits for females themselves, for their families, and the societies at large. Educated females have more opportunities for maintaining better family health and nutrition, lower maternal and child mortality, and lower birth rates. It was also confirmed that primary education continues to be the number one investment priority in developing countries and that investment in women's education is in general more profitable than that of men (Psacharopoulos, 1994; UNESCO,1994:7; UNICEF,1995:43; Nancy, 1997:20).

In Ethiopia, there has been considerable progress over the past seven years in extending education to a greater proportion of the country's population. However, a good educational foundation cannot be ensured only in getting all school age children into schools and by planning for additional places every year, but also in keeping them in school long enough to meet the desired pupil outcomes. In other words one of the ways of strengthening the primary education is preventing wastage by reducing the number of pupils who dropout/leave the system at different grade levels. Dropouts simply represent lost pupils and lost revenue (ERIC,

## CHAPTER TWO

### DATA AND METHODOLOGY

Successful modelling of a complex data set is part science, part statistical methods, and part experience and common sense.

(Hosmer and Lemeshow, 1989:82)

#### 2.1. Source of the Data

Source of the data is the 1998 Welfare Monitoring Survey (WMS), conducted by the Ethiopian Central Statistical Authority. The sampling design used was a multistage stratified sampling design. 1,380 rural and 447 urban sample enumeration areas were selected using a systematic probability proportional to size (size being the number of households obtained from the 1994 Population and Housing Census). In fact the survey covered the population in sedentary areas of the country on a sample basis excluding the non-sedentary population in Afar and Somali Regions. That is, the survey covered the population in sedentary areas of all regions that included the rural and selected urban areas. On the other hand, residents of collective quarters, homeless persons and foreigners were not covered in the survey.

33,981 or 98.5 percent households in rural areas and 11,142 or 99.7 percent households in urban areas were covered in the survey (CSA, 1999:5). The survey comprised 49,327 primary school age children (aged 7-14). Among these, 25,224 (or 51.1%) and 24,103 (or 48.9%) were males and

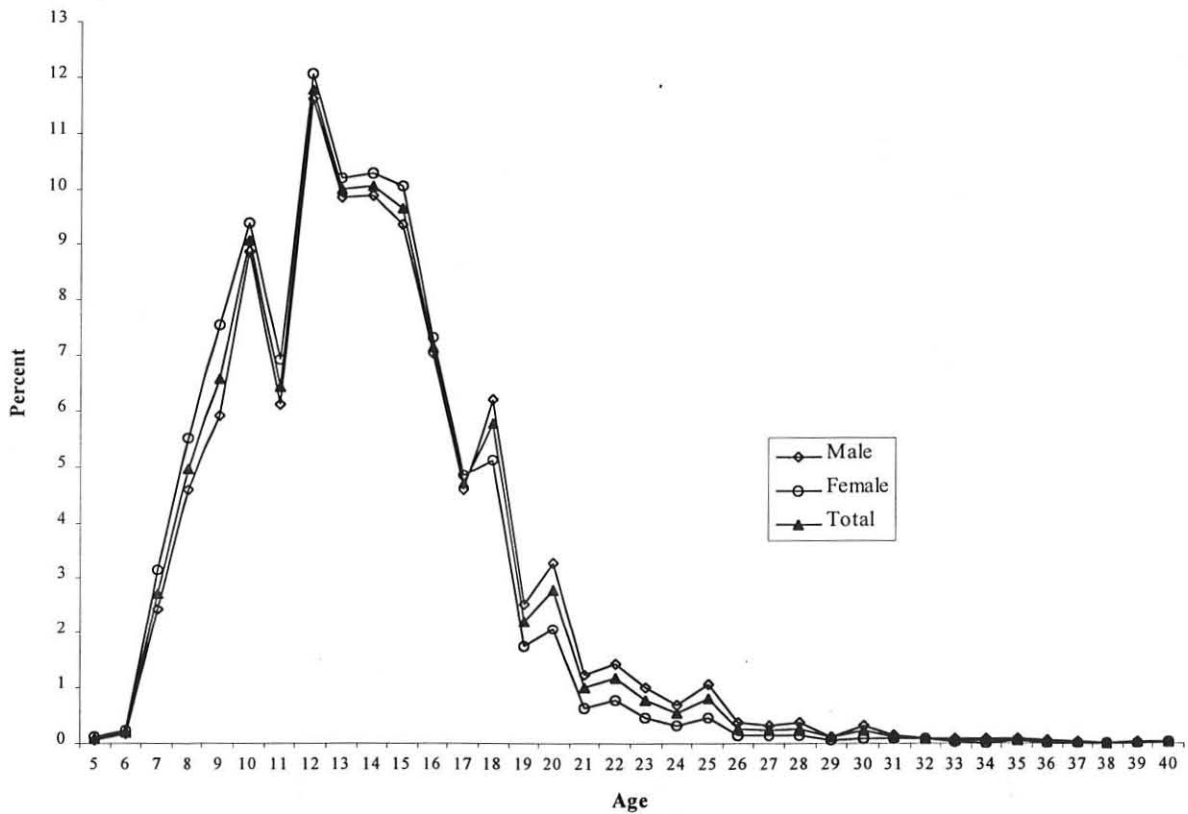
females respectively. Furthermore 22,787 primary school pupils (18445 stay-ins and 4,342 dropouts) from all regions in the country, who were enrolled during the academic year 1996/97, are included in the present study. Table 2.1. and Figure 2.1 elaborate the single-year age distribution data of primary school pupils included in the analysis.

Table 2.1. Single year age distribution of primary school pupils enrolment based on the 1998 WMS (Ethiopia, 1996/97)

Age	Male		Female		Both	
	Count	Percent	Count	Percent	Count	Percent
5	9	0.070	11	0.12	20	0.09
6	24	0.18	22	0.24	46	0.20
7	330	2.44	294	3.17	624	2.74
8	621	4.60	511	5.50	1132	4.97
9	800	5.92	700	7.54	1500	6.58
10	1199	8.88	870	9.37	2069	9.08
11	824	6.10	643	6.93	1467	6.44
12	1564	11.58	1118	12.04	2682	11.77
13	1329	9.84	946	10.19	2275	9.98
14	1333	9.87	953	10.27	2286	10.03
15	1263	9.35	932	10.04	2195	9.63
16	950	7.03	679	7.31	1629	7.15
17	620	4.59	450	4.85	1070	4.70
18	839	6.21	475	5.12	1314	5.77
19	342	2.53	162	1.75	504	2.21
20	440	3.26	192	2.07	632	2.77
21	168	1.24	59	0.64	227	1.00
22	195	1.44	73	0.79	268	1.18
23	137	1.01	42	0.45	179	0.79
24	93	0.69	30	0.32	123	0.54
25	142	1.05	42	0.45	184	0.81
26	49	0.36	12	0.13	61	0.27
27	42	0.31	13	0.14	55	0.24
28	49	0.36	13	0.14	62	0.27
29	17	0.13	6	0.06	23	0.10
30	42	0.31	8	0.09	50	0.22
31	19	0.14	9	0.10	28	0.12
32	13	0.10	7	0.08	20	0.09
33	11	0.08	2	0.02	13	0.06
34	11	0.08	1	0.01	12	0.05
35	11	0.08	4	0.04	15	0.07
36	6	0.04	0	0.00	6	0.03
37	5	0.04	0	0.00	5	0.02
38	1	0.01	1	0.01	2	0.01
39	3	0.02	1	0.01	4	0.02
40	3	0.02	2	0.02	5	0.02
<b>Total</b>	<b>13504</b>	<b>100.00</b>	<b>9283</b>	<b>100.00</b>	<b>22787</b>	<b>100.00</b>

Source: Extracted and computed by the author from the 1998 WMS

Figure 2.1. Percentage of single year age distribution of primary school pupils included in the study (Ethiopia, 1996/97)



Source: Sketched by the author from Table 2.1.

The mean age of the sample pupils in the data is 13.774 with standard error 0.028. The mode, median and standard deviation are 12, 13, and 4.274 respectively. More over, the distribution is skewed to the right.

## 2.2. Quality of the Data

The Ethiopian Central Statistical Authority, a national institution authorised to conduct censuses and sample surveys in the country employing trained professionals and skilled manpower, collected the data employed in this study for the national welfare monitoring. Thus, the data are assumed to be one of the most reliable data in the country. Moreover, the sampling design is scientific and the sample is representative. Table 2.2. shows a comparison of primary school pupils' data included in the analysis and the total enrolment data by region. If we compare the total actual primary school enrolment of the regions to their respective number of pupils drawn for the sample, we find them almost related to each other, except for very few regions like Addis. This ascertains the fact that the sample is representative.

Table 2.2. Comparison of total primary school pupils enrolment and sample size by region (Ethiopia, 1996/97)

Region	Population data (pupils)		Sample data (pupils)	
	Count*	Percent	Count**	Percent
Tigray	289,319	7.74	1,712	7.51
Afar	12,630	0.34	285	1.25
Amhara	825,468	22.09	3,676	16.13
Oromiya	1,265,028	33.85	5,698	25.01
Somali	59,949	1.60	431	1.89
Benishangul-Gumuz	51,641	1.38	1,708	7.50
SNNPR	1,052,119	28.15	4,826	21.18
Gambela	26,149	0.70	832	3.65
Harari	6,474	0.17	683	3.00
Addis_Ababa	127,106	3.40	2,360	10.36
Dire_Dawa	21,768	0.58	576	2.53
<b>Total</b>	<b>3,737,651</b>	<b>100.00</b>	<b>22,787</b>	<b>100</b>

Source: \* EMIS (Ministry of Education)

\*\* Computed by the author from the 1998 WMS

Although the data were collected by CSA and are representative, it can not be concluded that there is an absolute perfection in the quality of the data used for the study. For instance similar to situations in many developing countries, there may be a tendency of enumerators or respondents to report certain ages at the expense of others. This situation causes what demographers commonly call age heaping, age preference or digit preference, which refers to preference for the various ages having the same terminal digit. Age heaping is most pronounced among populations or population subgroups having a low educational status. Age misstatements can be classified in two groups. The first is net age misstatement, which is the number of persons reported at a particular age, minus the true number of persons at that age. The second is gross age misstatement, where some of the persons reporting themselves as aged “y” are counter-balanced, by persons aged “y” reporting themselves at other ages. Like grouped ages, single ages are also affected by other types of age miss-reporting, net under-enumeration and non-reporting or miss-assignment of age. But heaping is the principal type of error in single-year-of-age data. Because a net shift occurs when there is a systematic tendency for persons in a particular age range to report themselves as either younger or older than the true age, which is not counter-balanced by errors in the opposite direction. The causes and patterns of age or digit preference vary from one culture to another (Shryock and Siegel, 1971:118).

Due to the fact that an exact distinction between errors due to digit preference, other errors, and real fluctuations cannot be made, it is impossible to measure digit preferences precisely (Shryock and Siegel, 1971:118). However, a number of general methods and indexes of evaluating quality of data regarding age digit preferences have been proposed. In the present

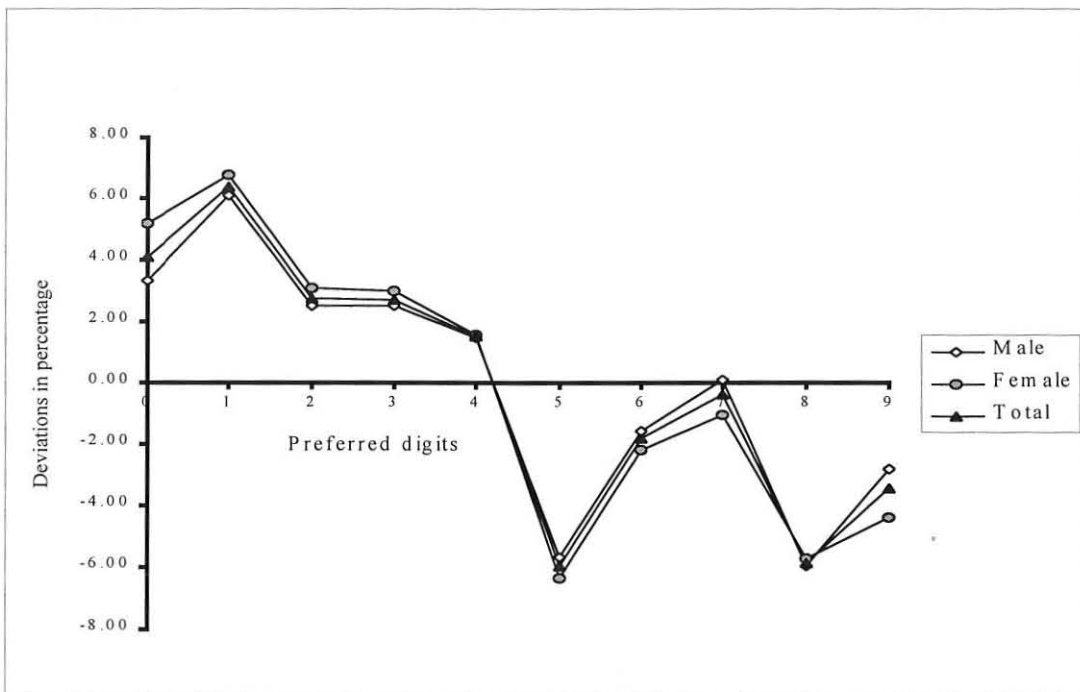
study, Myers' blended index is applied to see if severe age heaping exists within the data on primary school pupils under study. The method yields an index of preference for each terminal digit representing the deviation from 10.0 percent, of the proportion of the total number of pupils reporting on the given digit. A summary index of the preferences for all terminal digits was derived as one-half the sum of deviations from 10.0 percent, each taken without regard to its negative or positive sign. The theoretical value of the index may range from a minimum of zero to a maximum of 90. An approximate value zero of the index indicates that age heaping does not exist and a value of 90 indicates that there is a maximum heaping which can be verified as if all ages were reported as a single digit. In other words the index provides the proportion of pupils in the study sample whose age with an incorrect terminal digit is reported. In general the smaller the deviation from 10.0 percent the lesser the heaping of age exists. In this particular study, the summary index was found to be about 18 (16 for males and 20 for females). From the above statements and last figures, we can observe that there is no exaggerated age heaping. But we can say that age heaping is higher for girls than boys. As we can see from Table 2.3. and Figure 2.2, although the pattern of terminal digit preference of both sexes is similar, the absolute deviation of females is higher than that of males for all digits except terminal digit 8. Moreover, we can see that terminal digits 1, 5, and 8 were having relatively the highest absolute deviations from 10 for both sexes. Table 2.3. and Figure 2.2 give more sight into the situation of heaping and deviation.

Table 2.3. Myers' blended index for primary school pupils age data (Ethiopia, 1996/97)

Terminal Digit	Deviation from 10.0 percent		
	Male	Female	Both
0	3.33	5.21	4.08
1	6.12	6.74	6.37
2	2.53	3.12	2.76
3	2.50	3.00	2.70
4	1.50	1.59	1.54
5	-5.68	-6.32	-5.94
6	-1.58	-2.17	-1.82
7	0.08	-1.04	-0.37
8	-5.97	-5.73	-5.87
9	-2.82	-4.40	-3.45
Absolute Sum	32.11	39.31	34.89
Summary Index	16.06	19.66	17.45

Source: Computed by the author

Figure 2.2. Patterns of terminal digit preference deviations from the expected 10 percent (Ethiopia, Primary schools, 1996/97)



Source: Sketched by the author using Microsoft Excel chart facility based on Table 2.3.

### 2.3. Modelling/Methods of Analysis

The unit of analysis is a primary school pupil registered in the academic year 1996/97. The outcome variable called dependent variable is “The Probability of dropping out of primary school” which is a binary or dichotomous (with two outcomes) discrete variable and is represented by ‘Y’. The value label of the variable is ‘1’ if the pupil was enrolled in the academic year 1996/97 but dropped out, and ‘0’ otherwise. For the sake of simplicity and convenience, the counterparts of the dropouts will be called stay-ins in the rest of this study.

There are a number of multivariate statistical models that can be used to predict a dependent variable from a set of independent variables. However, some of the models pose difficulties when the dependent variable has two outcomes and the independent variables are a mixture of categorical and continuous variables as in the present study, because the multivariate normality assumption does not hold in such cases. Thus, the logistic regression model is appropriate and is recommended to predict the binary dependent variable (Hosmer, and Lemeshow, 1989:1; Sharma, 1996:317).

Let the conditional probability that a pupil drops out of primary school has occurred given X, be denoted by  $P(Y=1/X) = P$ ; where  $X = X_1, X_2, \dots, X_{14}$ ;  $i = 1, 2, \dots, n$  and  $n = 22,787$  which is the number of observations.

Then, the multivariate logistic regression model is given by:

$$P = \frac{\exp(\beta_0 + \beta_1 X_{i1} + \beta_2 X_{i2} + \dots + \beta_{14} X_{i14})}{1 + \exp(\beta_0 + \beta_1 X_{i1} + \beta_2 X_{i2} + \dots + \beta_{14} X_{i14})}$$

The ratio of the probability that a pupil drops out of primary school to the probability that she/he stays in given by  $\frac{P}{1-P}$  is known as the Odds Ratio.

Since the relationship between P and X is non-linear, we have to use a transformation in order to linearize it. The natural logarithm of the Odds Ratio gives us the logit transformation of the logistic regression (Hosmer and Lemeshow, 1989:6; Sharma, 1996:320) and can be written as:

$$f(x) = \text{logit}(Y) = \ln\left(\frac{P}{1-p}\right)$$

$$= \beta_0 + \beta_1 X_{i1} + \beta_2 X_{i2} + \dots + \beta_{14} X_{i14} + \epsilon, \text{ where } \epsilon \text{ is a vector of error terms.}$$

Thus,  $f(x) = \beta_0 + \beta_1 X_{i1} + \beta_2 X_{i2} + \dots + \beta_{14} X_{i14} + \epsilon$ , which is also commonly referred to as multiple logistic regression, or in short logistic regression, is linear in its parameters. This means that the relationship between the log of the odds and the independent variables is linear. The probability P may be continuous, and may assume any value between 0 and 1 depending up on the range  $(-\infty \text{ to } \infty+)$  of X, and hence has many of the desirable properties of a linear regression model. In other words, logit transformation is the linking function that gives the relationship between the probability of dropping out of primary school and the covariates affecting this (Hosmer and Lemeshow, 1989:39; Sharma, 1996:320). In this situation, the value of the outcome variable Y given X can be expressed as  $Y = P + \epsilon$ , where the error term  $\epsilon$  may assume either of the following values,

- (i) If  $Y=1$ , then  $\epsilon = 1-P$ , with probability of P and
- (ii) If  $Y= 0$ , then  $\epsilon = -P$ , with probability  $1-P$ .

Therefore, the following equation (after logit transformation is made) is fitted for the present study.

$$\text{Logit}(Y) = \beta_0 + \beta_1 X_{i1} + \beta_2 X_{i2} + \dots + \beta_{14} X_{i14} + \epsilon, \quad i = 1, 2, \dots, n.$$

Where,  $\beta_0, \beta_1, \beta_2, \dots, \beta_{14}$  are parameters to be estimated using the maximum likelihood method in the logistic regression by defining the likelihood function.  $X_{i1}, X_{i2}, \dots, X_{i10}$  are demographic covariates,  $X_{i11}$  is a social covariate and  $X_{i12}, X_{i13}$ , and  $X_{i14}$ , are economic covariates.  $n$  represents the number of observations which is equal to 22,787.

The coefficients,  $\beta_0, \beta_1, \beta_2, \dots, \beta_{14}$  show the change in the log odds associated with a unit change in the respective independent variables (covariates). The method of maximum likelihood (with the response variable assumed to have a binomial distribution) yields values for these unknown parameters, which maximise the probability of obtaining the observed set of data (Hosmer and Lemeshow, 1989:39; Sharma, 1996:320).

In terms of the odds, the logistic model can be written as

$$\frac{P}{1-P} = \exp(\beta_0 + \beta_1 X_{i1} + \beta_2 X_{i2} + \dots + \beta_{14} X_{i14}),$$
 which means that,  $\exp(\beta_j)$ , ( $j=1, 2, \dots, 14$ ), is the

factor by which the odds of dropping out of primary school change by a unit increase in the  $j^{\text{th}}$  independent variable. Three conditions are observed of the odds of dropping out, depending upon, the values of  $\beta_j$ .

- (i) If  $\beta_j > 0$ , then the odds of dropping out due to the covariate  $X_j$  increase.
- (ii) If  $\beta_j = 0$ , then the odds of dropping out due to the covariate  $X_j$  remain unchanged.
- (iii) If  $\beta_j < 0$ , then the odds of dropping out due to the covariate  $X_j$  decrease.



In order to make the resultant model numerically more stable and easily generalised, the number of independent variables in the model were minimised by selecting those variables that result in a best model within the scientific context of the problem. Hosmer and Lemeshow (1989:82-83), explaining the need for selecting important variables have stated the following. “The more variables included in a model, the greater the estimated standard errors become and the more dependent the model becomes on the observed data.” Thus, to select the variables that best explain the model, stepwise selection method is used. This method begins with a model that contains only the constant term  $\beta_0$ . At each step, the variable with smallest significance level for the score statistic was entered into the model provided that it is less than 0.05. (0.05 is the value to be taken as significance level in the study.)

The extent to which the observed data are classified correctly by the final multivariate logistic regression model is assessed by the use of classification table which depicts the number of cases in the analysis which are correctly classified or miss-classified. A classification table with more than 50% correctly classified cases represents a good model. Another measure of how well the model fits the given data is negative two multiplied by the Log Likelihood Ratio (-2LL) test of goodness of fit method. Likelihood is the probability of the observed results given the parameter estimates. If -2LL for the logistic regression model with a constant term only is greater than the -2LL for the model which incorporates all of the covariates, then the model explains the data well. Furthermore, in order to identify whether the covariates in the final model explain the variability in the dependent variable satisfactorily, we test if the model chi-square value is greater than the tabulated value with degrees of freedom equal to the number of significant covariates at the level of  $\alpha = 0.05$ . Where model Chi-square is the

difference of  $-2LL$  for the model with only a constant and  $-2LL$  for the model with the significant covariates. Thus, we test the null and alternative hypotheses,  $H_0$  and  $H_A$ , respectively given below.

$H_0 : \beta_j = 0$  for all  $j = 1, 2, \dots, 14$  which implies that the model is not adequate.

$H_A : \beta_j \neq 0$  for at least one  $j = 1, 2, \dots, 14$  implying that the model is adequate.

If model chi-square value exceeds the table chi-square value, then we reject  $H_0$ .

Preliminary analysis is also made using descriptive statistical methods. To analyse the necessary data, data collected by the Central Statistical Authority (CSA) were transferred from a computer in CSA to a computer with which the data were processed and analysed. A Zip disk with 100 megabytes (100 MB) capacity and a Zip drive were used for this purpose. Then the data were converted from Integrated Microcomputer Processing System (IMPS) data entry software into Statistical Package for the Social Sciences (SPSS) software, by redefining all variables so that ASCII files were converted into SPSS data files. Thus, computer and application software called SPSS (Statistical Package for the Social Sciences) were used for the analysis of the data. The same computer with Word processing package was used to prepare the document.

### **2.3.1. Covariates Selected for the Study**

Predicting whether an event will or will not occur and identifying the variables in making the prediction is an important step in carrying out a study. The independent variables, (often called "covariates") which are used in the study were classified as demographic and socio-economic covariates and are given in Table 2.4(a) and Table 2.4(b) respectively.

As it was given in the conceptual framework of this study and as presented in Table 2.4(a) and Table 2.4(b), marital status, urban-rural place of residence, region of residence and distance are used as demographic covariates in this study. This was done on the basis of some definitions of demography by several demographers and previous studies. (For instance, Haupt Arthur and Thomas T. Kane, 1998: 33; Department of Economics, Addis Ababa University and Department of Economics, University of Goteborg, 1994: 6, 9-16; Pressat, 1985:164-65; Lucas David, et al., 1980: 2-3; Bogue, 1969: 1-2; Hauser and Duncan, 1959: 2). Some of the definitions are given in Appendix 2. The definitions of urban and rural centres made by CSA and used for this study are also given in Appendix 2 of this material.

The assignment of value labels to the covariates was made on the basis of general literature and on some assumptions relating to the Ethiopian situation. For instance, in labelling age-grade mismatch of the pupil as “ 0 = appropriate and 1 = mismatch, the assumption that over-aged pupils are more likely to dropout of primary schools compared to pupils of the appropriate primary school age is understood. Other covariates with two categories are also labelled with similar assumptions. The covariates with more than two categories (region, and household head’s educational attainment) however, are considered on the basis of whether a reference category is defined or the average effect of all categories of the covariate under consideration is used for comparison of the effect of each category. In fact the value labels of distance to the nearest primary school are made on the basis of the researcher’s personal judgement, as there was no available standard for classifying these.

Table 2.4(a). Demographic covariates included in the analysis

Covariate	Description	Value Labels
X <sub>i1</sub>	Age-grade mismatch of the pupil	0 = Appropriate 1 = Mismatch
X <sub>i2</sub>	Sex of the pupil	0 = Male 1 = Female
X <sub>i3</sub>	Pupil's relationship to the head of household and spouse	0 = Common biological child 1 = Otherwise
X <sub>i4</sub>	Sex of the head of household	0 = Male 1 = Female
X <sub>i5</sub>	Household size	Counting Number in persons
X <sub>i6</sub>	Marital status of the pupil	0 = Single 1 = Ever married
X <sub>i7</sub>	Marital status of the head of household	0 = Currently married 1 = Otherwise
X <sub>i8</sub>	Place of residence (Location of household)	0 = Urban 1 = Rural
X <sub>i9</sub>	Distance to the nearest primary school	0 = Less than 4 km 1 = $\geq$ 4 km
X <sub>i10</sub>	Region	1 = Addis Ababa (reference category) 2 = Afar 3 = Amhara 4 = Oromiya 5 = Somali 6 = Benishangul-Gumuz 7 = SNNPR 8 = Gambella 9 = Harari 10 = Tigray 11 = Dire-Dawa

Table 2.4(b). Socio-economic covariates included in the analysis

Covariate	Description	Value Labels
X <sub>i11</sub>	Educational attainment of the head of household	0 = Above Grade 12 (reference category) 1 = Secondary school (grades 9-12), 2 = Primary school (grades 1-8), 3 = Illiterate
X <sub>i12</sub>	Pupil's Working Status	0 = Not working, 1 = Working
X <sub>i13</sub>	Yearly Household Income	0 = Above or equal to PNI (PNI=Birr1087.88) 1 = Below PNI
X <sub>i14</sub>	Household head's working Status	0 = Not working 1 = Working

\*Per-capita National Income taken as Ethiopian Birr 1087.8 (MEDAC, 1999:10)

## CHAPTER THREE

### ANALYSES, RESULTS, AND DISCUSSION

In this chapter analyses of the data, results, and discussion are presented. The analyses are carried out in two ways. The first deals with percentages and bivariate  $\chi^2$  (Chi-square) analysis. This examines the existence of significant associations between the covariates under study and primary school pupils attrition. The second presents multivariate logistic regression analysis and investigates the covariates of primary school pupils attrition and their relative contribution to the situation of dropping out or staying-in. The detailed results of each analysis are given in their respective sections.

#### 3.1. Bivariate Analysis and Results

As it was mentioned earlier, the present study has identified 4,342 (about 19 percent) dropouts and 18,445 (about 81 percent) stay-ins from all regions. Regional comparison of dropout rates compared to their respective primary school enrolment shows that the highest dropout rate was observed to be about 24 percent for Benishangul-Gumuz followed by about 22 percent for Amhara. The lowest primary school dropout rates were observed in Somali region and Addis Ababa city council (about 9 percent each).

Considering the regional proportions of primary school dropouts, (compared to the country's total number of primary school dropouts), the highest and lowest proportions were observed in Oromiya , about 26 percent and in Somali about 0.85 percent respectively. From Table 3.1, it

can also be observed that the proportion of female enrolments were less than 50 percent, and the worst were in Benshangul-Gumuz and Somali regions (about 30 percent each). Except for Addis Ababa and Gambela, the proportions of male dropouts as a percentage of the total respective number of dropouts were more than 50 percent, for all regions. This may be due to the low representation of female enrolment. In Addis Ababa and Gambela, the proportion of female dropouts was higher than that of males (56.83 and 52.70, respectively). In fact in Addis Ababa, female enrolment was higher than male enrolment, and the high female dropout may be because of a relatively higher enrolment, whereas the case of Gambela may not be speculated in this way. The regional percentages for each category of enrolment, stay-ins, and dropouts are given in Table 3.1.

Table 3.1. Primary School enrolment, stay-ins and dropouts by region and sex (Ethiopia, 1996/97)

Region	Pupil's Status	Sex of the pupil						
		Male		Female		Both		
		Count	Percent	Count	Percent	Count	Percent compared to:	
							Regional enrolment	National Totals *
Tigray	Enrolment	978	57.13	734	42.87	1712	100.00	7.51
	Stay-ins	818	58.30	585	41.70	1403	81.95	7.61
	Dropouts	160	51.78	149	48.22	309	18.05	7.12
Afar	Enrolment	177	62.11	108	37.89	285	100.00	1.25
	Stay-ins	144	64.29	80	35.71	224	78.60	1.21
	Dropouts	33	54.10	28	45.90	61	21.40	1.40
Amhara	Enrolment	1932	52.56	1744	47.44	3676	100.00	16.13
	Stay-ins	1520	52.81	1358	47.19	2878	78.29	15.60
	Dropouts	412	51.63	386	48.37	798	21.71	18.38
Oromiya	Enrolment	3460	60.72	2238	39.28	5698	100.00	25.01
	Stay-ins	2792	61.05	1781	38.95	4573	80.26	24.79
	Dropouts	668	59.38	457	40.62	1125	19.74	25.92
Somali	Enrolment	291	67.52	140	32.48	431	100.00	1.89
	Stay-ins	267	67.77	127	32.23	394	91.42	2.14
	Dropouts	24	64.86	13	35.14	37	8.58	0.85
Benishangul-Gumuz	Enrolment	1156	67.68	552	32.32	1708	100.00	7.50
	Stay-ins	890	68.09	417	31.91	1307	76.52	7.09
	Dropouts	266	66.33	135	33.67	401	23.48	9.24
SNNPR	Enrolment	3176	65.81	1650	34.19	4826	100.00	21.18
	Stay-ins	2506	65.98	1292	34.02	3798	78.70	20.59
	Dropouts	670	65.18	358	34.82	1028	21.30	23.68
Gambela	Enrolment	464	55.77	368	44.23	832	100.00	3.65
	Stay-ins	404	58.30	289	41.70	693	83.29	3.76
	Dropouts	60	43.17	79	56.83	139	16.71	3.20
Harari	Enrolment	418	61.20	265	38.80	683	100.00	3.00
	Stay-ins	344	61.87	212	38.13	556	81.41	3.01
	Dropouts	74	58.27	53	41.73	127	18.59	2.92
Addis Ababa	Enrolment	1126	47.71	1234	52.29	2360	100.00	10.36
	Stay-ins	1021	47.75	1117	52.25	2138	90.59	11.59
	Dropouts	105	47.30	117	52.70	222	9.41	5.11
Dire-dawa	Enrolment	326	56.60	250	43.40	576	100.00	2.53
	Stay-ins	271	56.34	210	43.66	481	83.51	2.61
	Dropouts	55	57.89	40	42.11	95	16.49	2.19
All Regions	Enrolment	13504	59.26	9283	40.74	22787		100.0
	Stay-ins	10977	59.51	7468	40.49	18445		80.95
	Dropouts	2527	58.20	1815	41.80	4342		19.05

Source: Computed by the author from the raw data collected in the 1998 WMS.

\* This column shows the regional percentage shares of each category (enrolment, stay-ins, and dropouts), compared to the national totals, (i.e., 22787, 18445, and 4342 respectively).

Bivariate analyses using  $\chi^2$  (Chi-square) technique were made in order to show the general feature of the covariates of primary school pupils attrition. The results are represented in Table 3.2.

According to the bivariate analyses results (Table 3.2.), seven of the ten demographic covariates in the study have shown significant association with primary school pupils attrition at less than 1% level. These are: age-grade mismatch of the pupil ( $X_{i1}$ ), pupil's relationship to the head of the household and spouse ( $X_{i3}$ ), household size ( $X_{i5}$ ), marital status of the pupil ( $X_{i6}$ ), urban-rural place of residence defined by location of the household ( $X_{i8}$ ), distance to the nearest primary school ( $X_{i9}$ ), and region ( $X_{i10}$ ). The three covariates found to have no statistically significant association to the dependent variable were: sex of the pupil ( $X_{i2}$ ), sex of the household head ( $X_{i4}$ ), and marital status of the household head ( $X_{i7}$ ). On the other hand, this analysis further showed that all of the socio-economic variables included in the study were statistically found to have significant association to pupils' staying in or dropping out of primary schools.

Table 3.2. Pearson chi-square ( $\chi^2$ ) test of primary school pupils attrition

Covariates	Name	df	$\chi^2$	Significance (P-value)
X <sub>i1</sub>	Age-grade mismatch of the pupil	1	15.37667	0.00009*
X <sub>i2</sub>	Sex of the pupil	1	2.51006	0.11312
X <sub>i3</sub>	Pupil's relationship to the head of household and spouse	1	24.49365	0.00000*
X <sub>i4</sub>	Sex of the head of household	1	0.10880	0.74151
X <sub>i5</sub>	Household size	22	197.77419	0.00000*
X <sub>i6</sub>	Marital status of the pupil	1	487.59034	0.00000*
X <sub>i7</sub>	Marital status of the head of household	1	3.21942	0.07277
X <sub>i8</sub>	Place of residence (Location of household)	1	456.70511	0.00000*
X <sub>i9</sub>	Distance to School	1	91.98247	0.00000*
X <sub>i10</sub>	Region	10	236.71037	0.00000*
X <sub>i11</sub>	Educational attainment of the head of household	3	212.9015	0.00000*
X <sub>i12</sub>	Pupil's Working Status	1	1044.01145	0.00000*
X <sub>i13</sub>	Yearly Household Income	1	322.10591	0.00000*
X <sub>i14</sub>	Household head's working Status	1	20.01080	0.00001*

Note: \* significant at  $\alpha < 0.01$

analysis were correctly classified ascertaining the adequacy of the model, since this figure is much higher than 50 percent.

For the model with the constant term ( $\beta_0$ ) only,  $-2LL$  was found to be 22195.244. For the final model with constant and covariates,  $-2LL$  was 20819.395. From this it can be seen that  $-2LL$  of the model containing only the constant exceeds  $-2LL$  of the model with the constant and covariates. These facts exhibit that the model explains the data quite well.

Upon testing  $H_0 : \beta_j = 0$  for all  $j = 1, 2, \dots, 14$  (which implies that no covariate explains variability in dropping out of or staying in primary schools) and  $H_A : \beta_j \neq 0$  for at least one  $j = 1, 2, \dots, 14$  (implying that at least one of the covariates explains the variability in dropping out or staying in), it was found that model chi-square value (1375.850) exceeded the table value (35.1725) with 23 degrees of freedom and the null hypotheses was rejected accepting the alternate one. These results are summarised in Table 3.7.

Table 3.7. Goodness-of-fit measures for the final logistic regression model on primary school pupils attrition (Ethiopia, 1996/97).

Statistic	Chi-square	df	Significance
-2LL (with only constant)	22195.244		
-2LL (with covariates)	20819.395		
Model chi-square (calculated chi-square value)	1375.850	23	0.0000
Table chi-square value	35.1725	23	
Improvement	4.772*	1	0.0298

\*This value shows that model chi-square value has increased by 4.772. compared to the previous model.

### 3.2.2. Demographic Covariates of Primary School Pupils Attrition

Similar results as bivariate analysis (Chi-square test) were obtained from the logistic regression analysis regarding the demographic covariates, except for  $X_{i2}$  (sex of the pupil) which was found to be significant in the multivariate logistic regression analysis but not in the bivariate analysis.

According to the multivariate logistic regression analysis, eight of the ten demographic covariates were found statistically significant in predicting primary school pupils attrition. These covariates were age-grade mismatch of the pupil ( $X_{i1}$ ), sex of the pupil ( $X_{i2}$ ), pupil's relationship to the head of household ( $X_{i3}$ ), household size ( $X_{i5}$ ), marital status of the pupil ( $X_{i6}$ ), place of residence or location of household ( $X_{i8}$ ), distance to the nearest primary school ( $X_{i9}$ ), and region ( $X_{i10}$ ). On the other hand, sex of the head of household ( $X_{i4}$ ) and his/her marital status ( $X_{i7}$ ) were the demographic covariates found to have no statistical significance in predicting the outcome variable.

Results of the final logistic regression model for both demographic and socio-economic covariates are presented in Table 3.8. Further observations on each demographic covariate on the basis of the final multiple logistic regression model as well as in relation to the hypotheses of the present study stated in the first chapter, are presented in the next paragraphs.

**Table 3.8.** Final multiple logistic regression model for demographic and socio-economic covariates of primary school pupils attrition entered on stepwise (Ethiopia, 1996/97).

Covariate	$\beta_j$	S.E.	df	exp( $\beta_j$ )
<b>Demographic</b>				
$X_{i1}$ = Age-grade mismatch	0.2218	0.0374	1	1.2484*
$X_{i2}$ = Sex of the pupil	0.2331	0.0365	1	1.2626*
$X_{i3}$ = Pupil's relationship	0.1058	0.0399	1	1.1116*
$X_{i5}$ = Household size (Number of persons)	-0.0611	0.0079	1	0.9408*
$X_{i6}$ = Pupil's marital status	0.9145	0.0416	1	2.4954*
$X_{i8}$ = Location of household (Urban_Rural)	0.5706	0.0468	1	1.7693*
$X_{i9}$ = Distance to the nearest primary school	0.1049	0.0481	1	1.1106**
$X_{i10}$ = Region			10	
$X_{i10(1)}$ = Afar	0.6984	0.1656	1	2.0105*
$X_{i10(2)}$ = Amhara	0.5702	0.0847	1	1.7687*
$X_{i10(3)}$ = Oromiya	0.5550	0.0812	1	1.7420*
$X_{i10(4)}$ = Somali	-0.2501	0.1896	1	0.7787
$X_{i10(5)}$ = Benshangul-Gumuz	0.5329	0.0965	1	1.7038*
$X_{i10(6)}$ = SNNPR	0.4474	0.0848	1	1.5643*
$X_{i10(7)}$ = Gambela	0.1384	0.1217	1	1.1485
$X_{i10(8)}$ = Harari	0.5407	0.1244	1	1.7172*
$X_{i10(9)}$ = Tigray	0.2686	0.0987	1	1.3081*
$X_{i10(10)}$ = Dire-Dawa	0.4829	0.1353	1	1.6208*
<b>Socio-economic</b>				
$X_{i11}$ = Household head's educational attainment			3	
$X_{i11(1)}$ = Grade 9-12	0.1454	0.1292	1	1.1565
$X_{i11(2)}$ = Grade 1-8	0.5776	0.1120	1	1.7818*
$X_{i11(3)}$ = Illiterate	0.6009	0.1118	1	1.8237*
$X_{i13}$ = Household income	0.1897	0.0406	1	1.2089*
Constant	-2.8794	0.1425	1	

Notes: 1. N = 22787 (13,504 males and 9,283 females)

2.  $X_{i4}$ ,  $X_{i7}$  and  $X_{i14}$  were removed from the final model on stepwise selection. Because in this study, they were found, to have no significant contribution to staying-in or dropping out of primary schools.
3. \* and \*\* are significant at  $\alpha < 0.01$  and  $\alpha < 0.05$  respectively.
4. For the categories of region ( $X_{i10}$ ) and household head's educational attainment ( $X_{i11}$ ), "Addis Ababa" and "above grade 12" are considered as reference categories respectively.

The first demographic covariate fitted in the final multivariate logistic regression model (along with the other ten demographic and four socio-economic covariates), is age given by  $X_{i1}$ . In

the beginning, age was considered as a continuous demographic covariate and was found to be statistically significant in affecting dropping out of primary schools positively. As age of the pupil increased, dropping out of primary schools was found to increase. But, in order to establish a comparison of dropping out of primary schools between the appropriate and mismatched school attendance ages, two categories were created so that a new categorical covariate with two categories namely “appropriate” and “mismatch” was created and included in the multiple logistic regression model. The “appropriate” category comprised the age group 7-14 and “mismatch” comprised the age group 15 and over. Then the analysis portrayed a statistically significant result assuring that pupils with age-grade mismatch were more likely to dropout of primary schools than their counter parts and supporting the first hypothesis of the present study. The estimated coefficient  $\beta_1$  of this covariate was 0.2218 and  $\exp(\beta_1) = \exp(0.2218) = 1.2484$ . This means that, when  $X_{11}$  changes from 0 to 1 or equivalently when age changes from “appropriate” to “mismatch”, the odds of dropping out of primary schools due to age mismatch are increased by a factor equal to 1.2484. This may imply that, late admission to primary schools may lead to early withdrawal from schools.

The second demographic covariate entered into the analysis was sex of the pupil ( $X_{12}$ ). When the value label for this covariate changed from 0 to 1, it was found that the odds of dropping out of primary school increased by a factor of 1.2626. This means that the risk of dropping out of primary schools was higher for females than males and the result agrees with the stated study hypothesis (i.e. the second hypothesis).

The third demographic covariate, pupil's relationship to the head and spouse of the household ( $X_{i3}$ ), was found to be statistically significant in increasing the odds of dropping out of primary schools. As a result, the likelihood of non-common biological children to dropout of primary schools was 1.1116 times higher than common-biological children.

The fourth demographic covariate, sex of the head of household ( $X_{i4}$ ) was rejected from the final logistic regression model by stepwise regression and was removed from the analysis. In other words, whether the head of the household from where the pupil has come, is male or female doesn't affect his/her staying or dropping out. Statistically speaking, this implies that the coefficient  $\beta_4$  of the covariate was found to be zero yielding  $\exp(\beta_4) = 1$ , and no change in the odds of dropping out.

The fifth demographic covariate, household size ( $X_{i5}$ ), in the beginning was labelled with three values coded as  $X_{i5(1)}$  or small household size, comprising 1-3 members,  $X_{i5(2)}$  or medium household size comprising 4-5 members, and  $X_{i5(3)}$  or large household size with more than six members. According to the multiple logistic regression analysis it was found that household size and dropping out of primary schools showed inverse relationship in the sense that the odds of dropping out of primary schools increased as a decrease in household size. Taking small household size as a reference category, the odds of dropping out of primary schools decreased by 0.2674 for pupils who came from large household sizes and by 0.1510 for those who came from medium household sizes. In general, the model generated a result that avers "the larger the household size, the lower is the probability of dropping out of primary schools". This finding is contrary to the third hypothesis stated for this study and it has

disproved it. This means that, pupils from large household sizes were more likely to stay in primary schools, compared to those from smaller household sizes. Further multiple logistic regression analysis on the same survey data taking household size as a continuous covariate has also strengthened this finding revealing that an increase of one person in the household decreased a pupil's dropping out of primary school by a factor 0.9408.

The sixth demographic covariate pupil's marital status ( $X_{i6}$ ) was found to be an important predictor of pupils' staying in or dropping out of primary schools. Accordingly, the odds of dropping out of primary schools increased by a factor of 2.4954 for pupils who have ever married compared to those who have never married. An impressive observation on this covariate is that, of all demographic covariates, it has the strongest effect of primary school pupils attrition, implying that marriage is the most influential demographic covariate that obliged pupils to dropout of their primary schooling.

Household head's marital status ( $X_{i7}$ ) is another demographic covariate that was found statistically insignificant in predicting attrition. Thus, like sex of the household head, it was removed from the final multiple logistic regression model.

Location of the household to which the pupil belongs or urban-rural place of residence ( $X_{i8}$ ), is the eighth demographic covariate in this study that was statistically significant in affecting attrition. When the value of this variable changes from 0 to 1 or equivalently as the place of residence changes from urban to rural, the odds of dropping out of primary school increase by a factor equal to 1.7693. In generalising this result, we may be safe to say that pupils from

rural households are more likely to drop out of primary schools, compared to those from urban households. This confirms the assertion given by the fourth study hypothesis and proves it.

Distance to the nearest primary school ( $X_{i9}$ ) also showed a significant result and the odds of dropping out of primary schools increased by a factor of 1.1106 for pupils where the household they live is more than four kilometres away from the nearest primary school. That means pupils living in households of a distance greater than or equal to four kilometres from the nearest primary school were more likely to dropout of their primary schooling than those living in households less than four kilometres.

The last and tenth demographic covariate in the present study is region ( $X_{i10}$ ) categorised into 11 categories. Considering Addis Ababa as the reference category and comparing each region with this reference category, it was found that the odds of primary school pupils attrition increased for all regions except Somali and Gambela regions for which their partial contribution to the model was negligible. Thus pupils residing in a region other than Addis Ababa are more likely to dropout than those residing in Addis. The highest Odds Ratio was observed in Afar region (2.0105).

Bivariate analysis on primary school grade level differentials also shows that grade level has a significant association with dropping out or staying in with Pearson's Chi-square value of 1309.94422 and degrees of freedom 7 at  $\alpha < 0.01$ . Table 3.3. gives the magnitude of dropping out and staying in primary schools by grade level. From Table 3.3, it can further be seen that about 49 percent of the total primary school pupils dropout was from grade one only, while grade one comprises 22.63 percent of the stay-ins . The high level of attrition at grade one in the present study is consistent to the annual reports from the Federal Ministry of Education during the last ten years.

Table 3.3. Percentage share of primary school grade level pupil stay-ins and dropouts (Ethiopia, 1996/97); N = 4342.

Grade level	Stay-ins		Dropouts	
	Count	Percent	Count	Percent
1	4174	22.63	2123	48.89
2	3493	18.94	543	12.51
3	2735	14.83	358	8.25
4	2059	11.16	250	5.76
5	1926	9.25	220	5.07
6	1675	8.02	195	4.49
7	1841	8.22	324	7.46
8	1610	6.95	329	7.58
Total	18445	100.00	4342	100.00

Source: Computed by the author.

Table 3.4. presents further observation of the trends in dropout rate at grade one across 1994/95-1998/99.

Table 3.4. Trend in dropout rates at grade one by sex (Ethiopia, 1994/95-1998/99)

Year	Dropout Rate		
	Male	Female	Both
1994/95	28.6	28.4	28.5
1995/96	29.3	29.5	29.4
1996/97	28.9	29.4	29.0
1997/98	27.2	26.5	27.0
1998/99	30.85	29.44	30.28

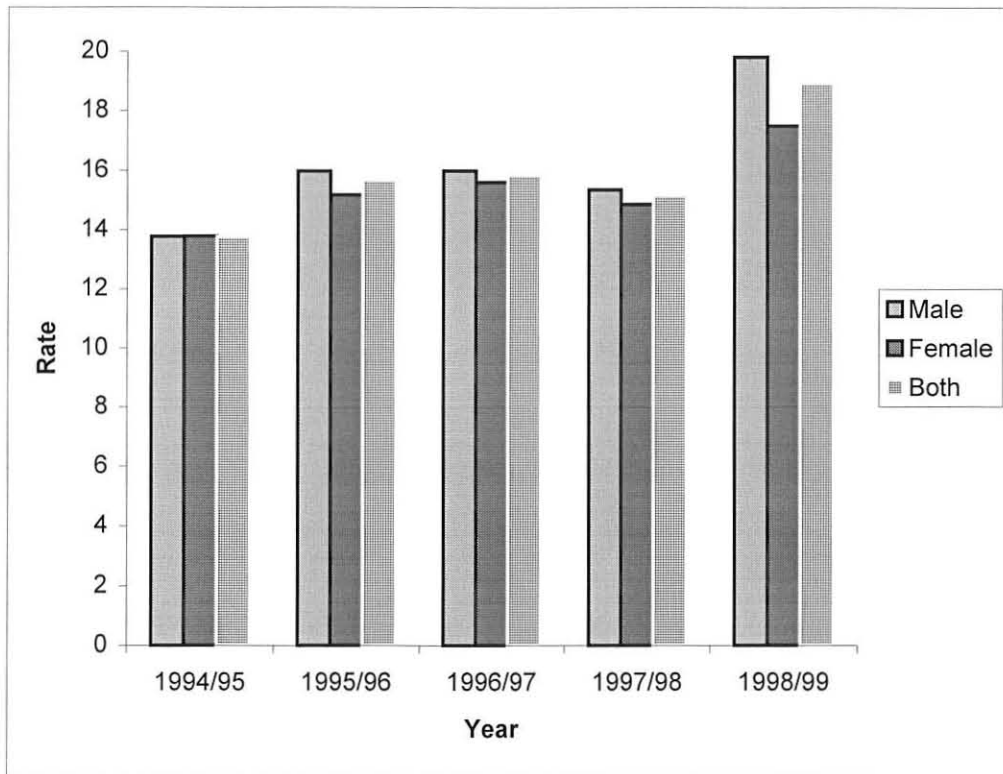
The trend in total primary school (grade1-8) dropout rate is also discouraging. For instance from Table 3.5, and Figure 3.1 it can be seen that the total primary school dropout rate in 1994/95 was 13.77 and has reached 18.94 in 1998/99.

Table 3.5. Trend in primary school dropout rate by sex (Ethiopia, 1994/95-1998/99)

Year	Dropout Rate		
	Male	Female	Both
1994/95	13.77	13.78	13.77
1995/96	15.97	15.18	15.68
1996/97	15.98	15.60	15.84
1997/98	15.35	14.86	15.17
1998/99	19.82	17.50	18.94

Source: Education Management Information Systems (Ministry of Education), 2000.

Figure 3.1. Trend of primary school dropout rate (Ethiopia, 1994/95-1998/99)



Source: Sketched by the author from Table 3.5 using Microsoft Excel

Table 3.6. presents the percentage of dropouts and stay-ins for each category of demographic and socio-economic covariate used for this study. From this table it can be seen that about 38 percent of the stay-ins and about 41 percent of the dropouts were of age-grade mismatch. This means that they were more than 14 years old, which is beyond the appropriate or standard primary school age interval (7-14 years of age). Moreover, only about 62 percent of the primary school pupils enrolled in the academic year 1996/97 belonged to the appropriate primary school age, while 38 percent did not.

**Table 3.6.** Percentage of primary school stay-ins and dropouts for each category of demographic and socio-economic covariates (Ethiopia, 1996/97)(N = 22,787 except X<sub>i12</sub> for which N = 19,645)

Covariate	Description	Value Labels	Stay-ins		Dropouts		Total	
			count	%	count	%	count	%
X <sub>i1</sub>	Age-grade mismatch of the pupil	0 = Appropriate	11,527	62.5	2,574	59.3	14,101	61.9
		1 = Mismatch	6,918	37.5	1,768	40.7	8,686	38.1
X <sub>i2</sub>	Sex of the pupil	0 = Male	10,977	59.5	2,527	58.2	13,504	59.3
		1 = Female	7,468	40.5	1,815	41.8	9,283	40.7
X <sub>i3</sub>	Pupil's relationship to the head of household and spouse	0 = CBC	10,849	58.8	2,375	54.7	13,224	58.0
		1 = NCBC	7,596	41.2	1,967	45.3	9,563	42.0
X <sub>i4</sub>	Sex of the head of household	0 = Male	13,931	75.5	3,269	75.3	17,200	75.5
		1 = Female	4,514	24.5	1,073	24.7	5,587	24.5
X <sub>i5</sub>	Household size	Number						
X <sub>i6</sub>	Marital status of the pupil	0 = Never married	15,530	84.2	3,027	69.7	18,557	81.4
		1 = Ever married	2,915	15.8	1,315	30.3	4,230	18.6
X <sub>i7</sub>	Marital status of the head of household	0 = Currently married	14,170	76.8	3,280	75.5	17,450	76.6
		1 = Otherwise	4,275	23.2	1,062	24.5	5,337	23.4
X <sub>i8</sub>	Place of residence (Location of household)	0 = Urban	9,619	52.1	1,482	34.1	11,101	48.7
		1 = Rural	8,826	47.9	2,860	65.9	11,686	51.3
X <sub>i9</sub>	Distance to School	0 = Less than 4 km	15,908	86.2	3,495	80.5	19,403	85.1
		1 = ≥4 km	2,537	13.8	847	19.5	3,384	14.9
X <sub>i10</sub>	Region	Given in Table 3.1.					22787	
X <sub>i11</sub>	Educational attainment of the head of household	0 = Above grade 12	986	5.3	102	2.3	1,088	4.8
		1 = Grades 9-12	1,787	9.7	214	4.9	2,001	8.8
		2 = Grades 1-8	5,648	30.6	1,265	29.1	6,913	30.3
		3 = Illiterate	10,024	54.3	2,761	63.6	12,785	56.1
X <sub>i12</sub>	Pupil's Working Status	0 = Not working,	13,962	86.9	2,166	63.9	16,128	82.9
		1 = Working	2,111	13.1	1,226	36.1	3,337	17.1
X <sub>i13</sub>	Yearly Household Income	0 = Above PNI	12,482	67.7	2,311	53.2	14,793	64.9
		1 = Below PNI	5,963	32.3	2,031	46.8	7,994	35.1
X <sub>i14</sub>	Household head's working Status	0 = Not working	15,568	84.4	3,782	87.1	19,350	84.9
		1 = Working	2,877	15.6	560	12.9	3,437	15.1
National Total		Stay-ins					18,445	80.9
		Dropout					4,342	19.1

Source: Computed by the author from the 1998 WMS.

- Note: 1. CBC = Common Biological Child  
 2. NCBC = Non-common Biological Child  
 3. PCNI = Per-capita National Income

Similarly about 40 percent of the stay-ins and about 42 percent of the dropouts were females.

The percentage of females enrolled in primary schools during the same academic was about 41.

The percentage of the categories for the rest of the covariates can be obtained from Table 3.4.

and can be interpreted in a similar fashion.

Regarding pupil's relationship to the head and spouse of the household, about 58 percent were common biological children of the head and spouse of the household. About 55 percent of the dropouts and about 59 percent of the stay-ins were also common biological children.

Considering sex of the head of household, we find that about 76 percent of the pupils were from male-headed households; about 75 percent of the dropouts and about 76 percent of the stay-ins were from male-headed households.

About 81 percent of the 22,787 pupils in the analysis were never married. Likewise, about 30 percent of the dropouts and 16 percent of the stay-ins were never married. The percentages of the rest of covariates are presented in Table 3.4, and can be interpreted in a similar way.

## **3.2. Multivariate Analysis and Results**

Further analysis using multiple logistic regression analysis was made to investigate and determine certain demographic and socio-economic covariates that can predict primary school pupils attrition. Results of the multivariate logistic regression analysis for each group of demographic and socio-economic covariates are presented in this part. But before interpreting results and deciding about the significance of the covariates as well as their respective effects on attrition, testing the adequacy of the fitted model was essential part of the analysis.

### **3.2.1. Model Adequacy**

Adequacy of the model was checked using classification table and the likelihood method. Multiple logistic regression classification result depicted that 81 percent of the cases in the

### 3.2.3. Socio-economic Covariates of Primary School Pupils Attrition

Household head's educational attainment ( $X_{i11}$ ), pupil's working status ( $X_{i12}$ ), yearly household income ( $X_{i13}$ ), and working status of the head of the household ( $X_{i14}$ ) were the socio-economic covariates incorporated in the analysis.

The multivariate logistic regression analysis on the household head's educational attainment demonstrated that the likelihood of dropping out of primary schools decreased as an increase of the household heads educational attainment. Taking household heads with educational attainment of higher than grade twelve as a reference category, the result further depicted that, pupils from illiterate households were 1.8237 times more likely to dropout. Considering highest grade attained by household heads as a continuous covariate also showed a similar result.

To study the effect pupils working status ( $X_{i12}$ ) on primary school attrition, the covariate was treated separately. Because in the Welfare Monitoring Survey (WMS) data on working status were collected for people aged ten years and above, while data on the other covariates were collected for all ages. This situation produced 3,322 pupils of age below ten years old. As exclusion of 3,322 cases in the analysis could affect the result, a separate model was fitted for this covariate. The analysis showed that, this covariate had the highest contribution in primary school pupils attrition compared to the other covariates. Accordingly, it was found that

working children were 3.7436 times more likely to dropout of primary schools than non-working children and this result is a proof to the fifth hypothesis of the study.

The income covariate ( $X_{i13}$ ) in this study was defined as yearly household income and labelled as “above or below” national per-capita income. From the corresponding result of the analysis, it was observed that pupils from households with income less than the national per-capita income were 1.2089 times more likely to dropout of primary schools than those pupils from households with yearly income greater than or equal to the national per-capita income. Thus, the present study proved that the lower the household income, the higher was the likelihood of dropping out of primary schools.

Finally the socio-economic covariate household heads working status ( $X_{i14}$ ) was not found to be statistically significant and was removed from the final logistic regression model on stepwise selection.

### **3.3. Discussion**

The existence or non-existence of causal relationships between primary school pupils attrition and some demographic and socio-economic covariates, as well as the direction of causation if the relation exists, was established using the multivariate regression model as presented in the last sub-sections of this chapter. A general discussion about the findings is presented here.

According to the findings of the present study regarding age-grade mismatch of the pupil, it was presented that older cohorts enrolled in primary schools were more likely to dropout. This

result conforms to the findings of Tadesse (1975), Meekers and Ahmed, (1999). This may be due to different demographic and socio-economic reasons. Attending classes with pupils younger than them might lower their interest, they may be responsible to work and help their aged parents, tradition may oblige them to marry and replace their generation, etc.

The risk of dropping out of primary schools increased for females compared to males. This may be attributed to different reasons. First and foremost, perhaps, females are at a high risk of rape and early marriage, followed by early pregnancy, unsafe abortion, and early maternity. Furthermore, they are considered as responsible to support the family at home in preparing food, fetching water, washing clothes etc.

The odds of dropping out of primary schools increased for non-common biological children than biological children. This may be attributed to the difference in encouraging, caring and rearing of common and non-common biological children. For example Mulugeta and Amanuel (2000) found a similar result regarding primary school pupils enrolment and the presence of bias in favour of their common/mutual biological children.

The result regarding household size and dropping out of primary schools in this study was found to be contrary to the general literature. According to this study, household size was found to have a negative effect on dropping out of primary schools. An increase of one person in the household decreased the odds of dropping out by a factor of 0.9408. Although further research need to be conducted, the explanation behind this situation may be the following. If there are more members in the household, tasks may be shared among them providing the opportunity of going to school by shifts. There may also be members in the household not

attending school and covering tasks that would have been performed by pupils going to school. In other words, with more members in the household, responsibilities for child care and other domestic and economic tasks may be shared and at least some children can attend primary schooling. In fact studies by Lloyd and Ann (1993) and Gomes (1984) were in line with the present study.

Pupil's marital status among all other demographic covariates, as presented in the analysis, had the strongest effect on primary school pupils attrition. The odds of dropping out of primary schools increased by a factor of 2.4954 at 95% confidence level for those ever married pupils. This finding agrees with previous studies by Gardner (1998), Sarkar (1983), UNFPA (200a), etc. This may be because of some cultural practices of marriage. For instance in some parts of Amhara and Tigray regions, small girls are taken to their "prospective" or would be husbands' parents with a promise of rearing and educating them until they become matured for marriage or sexual intercourse. However, the promise may be broken leading them to early pregnancy and maternity and dropping out of school. Even if they marry legally after maturity and bear a child they may prefer rearing their young to going school. In general in a society like Ethiopia where the social development is low, and where in many cases husbands do not accept educating wives as useful, marriage may aggravate the problem of attrition.

Rural residence of the households where the pupils came from, was also a significant covariate in affecting dropping out of primary schools and rural residence increased the odds of dropping out by a factor equal to 1.7693. In Ethiopia it is well known that 85 percent of the population live in rural areas where the infrastructure is extremely poor, and where the

livelihoods of the people highly depend on agriculture. This fact may be a major reason that pushes rural pupils from schooling. In rural areas of Ethiopia, we can say that wealth flows from children to parents and children play an important economic role, and this shows that the economic value of children is very high. In rural areas children after the age of seven are considered legible to look after cattle, to collect and sell fire wood, to fetch water, to plough land, collect crops, during times of harvest, etc. All of these may be impediments for pupils to leave their primary schooling. In many rural schools, classrooms are full at the beginning of the school year. But after some months, they decrease greatly.

For many other primary school pupils, distance from school to their home is a cause for dropping out, as this study also reveals the fact that the odds of dropping out increase as an increase in the distance from the nearest school to the households where they come from. By and large, this situation is more prevalent in rural areas than urban areas. Although the number of schools in the rural areas of Ethiopia is increasing from time to time, the problem still exists as the rural households are scattered away from the schools and the unfavourable infrastructure and land feature of the country exposes pupils to different natural and man made challenges.

Living in other regions compared to Addis Ababa was also found to have a significant contribution in increasing the odds of dropping out of primary schools. There are many obvious evidences, witnessing that Addis Ababa is much better than the regions. But then the regions may have, their own demographic and socio-economic features, which affect the situation of primary school pupils attrition that may require independent studies. For instance it was observed in this study that Somali region has the lowest dropout rate, while there is a

great disparity compared to Addis Ababa and other regions. Although further study may be required, the odds of dropping out of primary schools decreased for pupils residing in Somali region. Perhaps, this may be attributed to the fact that the survey covered only some sedentary urban centres of Somali region. As it was seen from the results of the analysis, the highest odds ratio of dropping among all regions was observed for Afar region. This may be attributed to the fact that Afar region is characterised by nomadic activity that might oblige people to move from place to place leading to the dropping out of primary school pupils. More over the climate of afar region characterised by high temperature could be another reason. Another observation from the final logistic regression model regarding regions is that the odds of dropping out of primary schools for pupils from Benishangul-Gumuz and Harari regions compared to Addis Ababa were almost the same (1.7038 and 1.7172 respectively). A possible explanation to this may be the similarity of situations in the two regions regarding primary school pupils attrition.

Although automatic promotion at the first cycle grades (grade 1, grade 2 and grade 3) was decided and directives forwarded to the respective regions, it seems that regions have not implemented the automatic promotion policy. This can be attested by the fact that grade one repetition rates in the academic years 1994/95, 1995/96, 1996/97, and 1997/98 were 17.8 percent, 13.5 percent, 16.7 percent, and 17.3 percent respectively (MOE, 1999c:45). Moreover, 42.3 percent of the primary school dropouts in the survey data used for this study also reported that they dropped out, because they failed to pass examinations. This shows that grade repetition may also be a factor pushing pupils to dropout of primary schools.

In looking into the social covariate considered in this study, we observe that household head's educational attainment has shown a statistically significant negative effect on dropping out of primary schools. As in the case of many studies (Darge, 1997, Yelfign, et al. 1995, Wana and Tsion, 1994, Tadesse, 1975), the present study attested that educational attainment of the head of household plays an important role in decreasing primary school pupils attrition. That means, as educational attainment of the head increases the risk of a pupil from the household to dropout decreases. The possible explanation may be, that educated parents may understand the value of education in general and the value of educating their children in particular. It is obvious that investment in children's education doesn't provide an immediate benefit, but this fact can easily be understood only by educated people and may be by non-educated people who have benefited from it. In other words every one doesn't understand the value of education in its future positive aspect and those relatively educated people understand its value better than those not educated.

The multivariate logistic regression results regarding the two significant economic covariates, also agree with previous studies made in this area and in this regard. As income increases dropout decreases, because those who have relatively better income may send their children to school, because they may be able to afford the costs of educating their children. On the other hand those getting a lower income may face difficulties in covering costs of educating their children and may tend to encourage them not to go to school. They may even need their children's help in income making.

The risk of working children to dropout of primary schools may be attributed to similar reasons mentioned earlier. Besides, working children may feel tired of the work they perform, and may be less motivated to attend school regularly. Then if they become absent for some days they may feel not going back to school for academic reasons and individual wrong perceptions.

# CHAPTER FOUR

## SUMMARY, CONCLUSIONS, AND POLICY RECOMMENDATIONS

In this chapter summary of the previous chapters, conclusions drawn from the study findings and policy relevant recommendations are presented.

### **4.1. Summary**

The inception of the study was the prevailing high primary school pupils attrition in the country leading to wastage in human and material resources. Although the details of the study are presented under each respective chapter, some highlights of the contents of the chapters are summarised here.

In chapter one, the importance of education for development, its relationship and contribution in affecting fertility, mortality and migration, the demographic and socio-economic profile of Ethiopia, statement of the problem, review of related literature, objectives of the study, the conceptual framework, significance of the study, as well as, the scope and limitations of the study were presented. The general objective of this study was to identify some main demographic and socio-economic differentials and covariates of primary school pupils attrition in Ethiopia referring to data of the academic year 1996/97. This study had two specific

objectives, derived from the general objective. The first was, to identify differentials in attrition problem by age, sex, grade level, and place of residence. The second was, to identify the demographic and socio-economic covariates, which most determine primary school pupils attrition in the country with reference to the same academic year. Six hypotheses regarding age-grade mismatch, sex of the pupil, relationship of the pupil to the head and spouse of the household, size of the household where the pupils came from, urban rural place of residence and pupil's working status were also stated in this chapter and tested in chapter three.

Chapter two dealt with data and methodology. Source of the data was the 1998 WMS conducted by the Ethiopian Central Statistical authority and 22,787 primary school pupils were taken for the study. In this chapter, age data quality was checked using Myers' blended index and proportions were calculated to see if the sample was representative. In this chapter the logistic regression model as the methodology employed for this study was explained.

In chapter three, analysis, results and discussion are presented. Ten demographic and four socio-economic covariates were included in the study. Age-grade mismatch of the pupil, sex of the pupil, relationship of the pupil to the head and spouse of the household, household head's sex, household size, pupil's marital status, household head's marital status, urban-rural place of residence, distance to the nearest primary school, and regions are the demographic covariates. Household head's educational attainment, household income and pupil's working status are the socio-economic covariates included in the study. The analyses were done with the help of a computer and software called Statistical Package for the Social Sciences (SPSS). In the multivariate logistic regression analysis, all of the demographic covariates except sex

and marital status of the head of the household were found to be statistically significant predictors of primary school attrition. Age-grade mismatch, female pupils, ever married pupils, non-common biological children, residence in rural households, distance to the nearest primary school, and regions affected dropping out positively. On the other hand, household size affected dropping out negatively. Household head's sex and marital status were found to have no statistically significant effect. Both, socio-economic covariates namely household heads educational attainment and household income showed a significant result of reducing dropouts. Most results are presented in the form of tables preceded or followed by some basic explanations. The discussion of findings was made in comparison and contrast to some previous studies.

## **4.2. Conclusions**

Based on the data and methodology employed for the present study, the general and specific objectives are fulfilled and the hypotheses tested.

The general objective of the study was to identify some main demographic and socio-economic differentials and covariates of primary school pupils attrition in Ethiopia with reference to the academic year 1996/97. The first specific objective extracted from this general objective was, to identify differentials in attrition problem by age, sex, grade level, place of residence etc. Then, it was found from the analyses that, there were age, sex, pupils relationship to the head and spouse of the house hold, grade level, pupil's marital status, household size, place of residence, distance to school, household head's educational

attainment, and household income differences in attrition of primary schools. Pupils with appropriate school age were found more likely to stay-in schools than, those with age-grade mismatch. Male pupils more likely stayed-in, than females. Other grade levels than grade one; common biological children than others; pupils from larger households than those from smaller households; never married pupils than ever married; pupils from urban households than those from rural households; pupils from Addis Ababa than those from other regions; pupils from households with higher educational attainment than their counterparts; and non-working children than working children were more likely to stay-in. The second specific objective was, to identify the factors, which most affect primary school pupils attrition in Ethiopia with reference to the year 1996/97. Then, according to the results of the multivariate logistic regression model, pupil's working status, pupil's marital status and Afar region, in this order were the covariates that most affected dropping out of primary schools in Ethiopia during the academic year 1996/97.

Five of the six hypotheses were proved to be true and one of them, the third hypothesis, on the relationship between household size and attrition was disproved. Based on the hypotheses and results of the analyses, the following conclusions are made.

1. Pupil's working status was the most statistically significant predictor of dropping out.
2. Pupil's marital status was the second most important predictor of primary school pupils attrition.
3. Pupils in the regions are at the risk of dropping out of school compared to those in Addis Ababa.

4. Pupils with age-grade mismatch were 1.2484 times more likely to drop out of primary schools compared to those of the appropriate primary school age.
5. Females were more likely to dropout of primary schools than males. In other words being a female increases the odds of dropping out of primary schools by a factor equal to 1.2626.
6. The larger the household size, the lower was the likelihood of pupils to drop out of primary schools. An increase of one person in the household size decreased the odds of dropping out of primary schools by a factor equal to 0.9408.
7. Pupils from rural households are more likely to drop out of primary schools, compared to those from urban households. The odds of dropping out of primary schools increased by a factor of 1.7693 for pupils coming from rural households.
8. Working children are more likely to drop out of primary schools than non-working children. The odds of dropping out of primary schools increased by a factor of 3.7436 for working children.
9. The higher the household income the lower is the likelihood of dropping out of primary schools. The likelihood/odds of dropping out of primary schools increased by a factor equal to 1.2089 for pupils from households of income less than the national per-capita income (i.e., less than Ethiopian Birr1087.80 per annum).

### 4.3. Policy Recommendations

Education is one of the most priority areas of public investment for sustainable development of any country. Besides its importance as a component of the Human Development Index (HDI) of a country, it affects the other components namely longevity and income. It has to be understood however, that the education indicators considered as components for determining HDI are literacy and gross enrolment ratios at both primary and secondary levels. Even then Ethiopia has one of the least indices of the world. For instance in 1999, Ethiopia's human development index was 0.298 which was the least of the world. This shows that Ethiopia's literacy rate school enrolment rate, and life expectancy, are among the least in the world. Dropouts further decrease Ethiopia's yearly primary school enrolment in addition to its being very low. From the present study it was seen that a substantial number of children are leaving their primary education. This situation may become a potential political, demographic and socio-economic problem for the country and may continue to affect the country's HDI negatively. It may also have a considerable impact on fertility.

Thus, as the author/researcher believes that the findings of this study may have clear policy implications, the following recommendations are made:

1. Further small and large scale research works in this problem area, that incorporate other in school and out of school covariates need to be encouraged. Special emphasis, need to be

made in the research to further investigate the relationship and direction of causation of household size and dropping out, family size and dropping out of primary schools.

2. The central government has to establish clear policy guidelines that involve educational managers at different levels of the system and communities for dropout prevention. Regions need to increase resources not only for enrolment, but also for keeping the pupils until they attain the desired objectives and thereby preventing attrition. Otherwise already set up targets remain on the paper only. For instance the Ministry of Education has already set a target of reducing grade one dropout rate to 14.2 percent and total primary school dropout rate to 4.2 percent, by the academic year 2001/2002. But it seems an unattainable target, where, grade one, and total primary school dropout rates in 1998/99 were about 30 and about 19 percent respectively (MOE, 2000:19).
3. Substantial variations in dropping out of primary schools exist with respect to gender, place of residence, and household income. Thus, special attention has to be given to the disadvantaged groups like females, rural areas, and to those coming from relatively lower income households, to reduce primary school attrition. Creating awareness in the population about the importance of education and the need to reduce dropout rate has to be taken as one major task of the Education Sector Development Programme. The ongoing efforts of, promoting female education has to be strengthened as it allows them to improve their status and empowerment.
4. Since distance to the nearest primary school in the present study was found positively related to primary school pupils attrition, there is a need to exercise and expand school

mapping practices to further study the situation and to enable students to attend their education at the shortest possible distance.

5. From the author's experience in some rural parts of the country, school-feeding programme was found to play a considerable role in preventing primary school pupils from dropping out. Thus, expanding of this programme to the rural schools of some disadvantaged areas of the country has to be taken as one solution of dropout prevention. This can be made in collaboration with some donor agencies and community development organisations.
6. There is a need to create awareness among the population about the advantages of grade one enrolment at the appropriate age of admission (age seven) and about the consequences of early marriage. Although the revised Ethiopian Family Law has been adopted in July 2000 and establishes 18 years as a minimum age of marriage for both female and male, there is a need of creating awareness in the population for its implementation.
7. Pupil's working status, as it was found to be the most statistically significant covariate of attrition, it needs an attention. As the economic value of children in Ethiopia is high, the discontinuance of child labour may take a long time and children may still remain to be part of the labour force in both urban and rural areas of the country. Thus, awareness raising among parents to educate their children has to be considered as a means to minimise dropping out due to child labour. Parents need to have knowledge of the future advantage (to children and to parents themselves) from education, so that they do not oblige children to participate in full-time domestic and economic activities.

## REFERENCES

- Bandarage, Asoka, 1997. *Women Population and Global Crises: Political Economic Analysis*. London: Zed Books.
- Berhan Hailu, 1996. *Financing Technical and Vocational Schools in Ethiopia, under the New Policy of Education: An Analysis taken for Tigray Region*. Mannheim, Germany: German Foundation For International Development (DSE).
- Bicego, George and Omar B.Ahmed, 1996. *Infant and Child Mortality*. Demographic and Health Surveys (DHS) Comparative Studies No.20. Calverton, Maryland: Macro International Inc.
- Bogue, Donald, J.1969. *Principles of Demography*. New York: John Wiley and Sons, INC.
- Brimer, M.A. and L. Paul, 1971. *Wastage in Education: A World Problem*. Paris:UNESCO.
- Caudhury, Raffiquel Huda. 1982. *Social Aspects of Fertility: With Special Reference to Developing Countries*. Newdelhi: Vikas Publishing House Pvt. LTD.
- Central Statistical Authority (CSA), 1998. *The 1994 Population and Housing Census Report*. Addis Ababa: CSA.
- Central Statistical Authority (CSA), 1999. *Report on The 1998 Welfare Monitoring Survey*. Statistical Bulletin No. 224. Addis Ababa: CSA.
- Chau Ta Ngoc, 1969. *Demographic aspects of educational planning*. Belgium:UNESCO.
- Darge Wole, 1997. "Primary school and Wastage Rates in Different Regions and Associated Factors." In Fukui, K., E. Kurimoto, and M. Shigeta, (eds). *Ethiopia in Broader Perspective: Papers of the 13<sup>th</sup> International Conference of Ethiopian Studies*, Vol. I-III, Kyoto: Shokado Book Sellers.
- Department of Economics, Addis Ababa University, Ethiopia, Department of Economics, University of Goteborg, Sweden, and Institute of Development Research, Addis Ababa University, Ethiopia, 1994. *Report on the 1994 Socio-economic Survey of Major Urban Centres in Ethiopia*. Ethiopia: Institute of Development Research (IDR).

- Dissanayake, Lakshman, 1996. "The First Generation with Mass Schooling and Fertility Transition: The Case of Sri Lanka." In Douglas, Robert, M.; Gavin J. and Rennie M.D'Souza, (eds). *The Shaping of Fertility and Mortality Declines: The Contemporary Demographic Transition*. Cambera:Health Transition Centre.
- Educational Resources Information Center (ERIC), 1984. *School Dropouts*.(Internet Source).
- Eicher J.C., 1984. *Educational Costing and Financing in Developing Countries: Focus on Sub-Saharan Africa*. World Bank Working Papers No.655. New York: World Bank.
- Ekanem., I.I., and O.O., Arowolo, 1994. *Population and Development Planning: An integrated approach. Kenya. Some Lessons For African Countries*. Nigeria: Okpaku Communications Corporation.
- Elizabeth M.King, and M.Anne Hill, 1993. *Women's Education in Developing Countries: Barriers, Benefits, and Policies*. New York:World Bank.
- Federal Democratic Republic of Ethiopia (FDRE), 2000. *Revised Family Law of Ethiopia*. Addis Ababa: Berhanena Selam Printing Enterprise.
- Gardner, Robert. 1998. *Education*. Demographic and Health Surveys (DHS) Comparative Studies No.29. Calverton, Maryland: Macro International Inc.
- Gomes M., 1984. "Family Size and Educational Attainment in Kenya" *Population and Development Review* 10(4): 647-660. U.S.A.: The Population Council, Inc.
- Hanushek, Eric A., 1995. "Interpreting Recent Research on Schooling in Developing Countries". *The World Bank Research Observer*, 10(2):227-246. New York: World Bank.
- Hauser, P. and O. Duncan, 1959. *The Study of Population*. Chicago: University of Chicago.
- Haupt, A. and, T. Thomas, 1998. *Population Reference Bureau's Population Handbook*. Washington D.C.: Population Reference Bureau.
- Hosmer, D.W. and Lemeshow, S.1989. *Applied logistic Regression*. New York: John Wiley and Sons, INC.
- Hughe, J.M., 1973. *The Slow Learner in Your Class*. London: Watson and Viney Ltd.

- Kennedy, John F., 1963, Public Papers of the Presidents of the USA: USA.
- Levy, M.B., 1971. "Determinants of Primary School Dropouts in Developing Countries." *Comparative Education Review*, 15(1), Chicago: University of Chicago Press.
- Lloyd, Cynthia B. and Ann K. Blanc, 1993. "Children's Schooling in sub-Saharan Africa: The Role of Fathers, Mothers, and Others," *Population and Development Review* 22(2): 265-298. U.S.A.: The Population Council, Inc.
- Lockheed, Marlaine E. and Verspoor A.,1994. *Improving the Quality of Primary Education in developing Countries*New York: Oxford University Press.
- Lockheed, Marlaine E. and Verspoor A.,1991. *Improving the Quality of Primary Education in developing Countries*. New York: Oxford University Press.
- Lucas David, Peter McDonald, Elspeth Young and Christabel Young, 1980. *Beginning Population Studies*. Canberra: The Australian University.
- Mahmud, S. and Anne, M., 1994. Women's Status, Empowerment, and Reproductive Outcomes. In Sen G., Adrienne G., and Lincoln C. C.(eds). *Population Policies Reconsidered: Health, Empowerment, and Rights*. Boston: Harvard School of Public Health.
- Meekers, D. and G. Ahmed, 1999. "Pregnancy-related School Dropouts in Botswana." *Population Studies: A Journal of Demography* 53(2), 195-209. Great Britain: Population Investigation Committee.
- Menza V. and J.R. Lupien, 1998. World Population and Nutritional Well-being. In Polumin N. (ed), *Population and Global Security*. UK: Cambridge University Press.
- Mialaret, G., 1979. *The Child's Right to Education*. Paris:UNESCO.
- Ministry of Education and Fine Arts, 1972. *Report of the Education Sector Review, Education: Challenge to the Nation*. Addis Ababa: Ministry of Education and Fine Arts.
- Ministry of Education, 1986. *Evaluative Research of the General Education System in Ethiopia: A Quality Study*. Addis Ababa: Ministry of Education.

- Ministry of Education (MOE), 1994. *Education Statistics Annual Abstract*. Addis Ababa: MOE.
- Ministry of Education, 1995. *Education Statistics Annual Abstract*. Addis Ababa: Educational Materials Production and Distribution Agency (EMPDA).
- Ministry of Education, 1996. *Education Statistics Annual Abstract*. Addis Ababa: EMPDA.
- Ministry of Education, 1997. *Education Statistics Annual Abstract*. Addis Ababa: Commercial Printing Enterprise.
- Ministry of Education, 1998. *Education Statistics Annual Abstract*. Addis Ababa: MOE.
- Ministry of Education, 1999a. *Education Statistics Annual Abstract*. Addis Ababa: Bole Printing Enterprise.
- Ministry of Education, 1999b. *Education Statistics Annual Abstract*. Addis Ababa: Master Printing Press.
- Ministry of Education, 1999c. *Indicators of the Ethiopian Education System*. Addis Ababa: Artistic Printing Enterprise .
- Ministry of Education, 2000. *Education Statistics Annual Abstract*. Addis Ababa: BerhanenaSelam Printing Enterprise.
- Misistry of Economic Development and Co-operation (MEDAC), 1999. *Poverty Situation in Ethiopia*. Addis Ababa: MEDAC.
- Mulugeta Gebreselassie and Amanuel Gebru, 2000. *Salient Socio-economic and Demographic Aspects of School Enrolment: The Case of Primary Schooling in Ethiopia*. *Eastern Africa Social Science Research Review* 15(2), 1-25. Addis Ababa: Commercial Printing Enterprise.
- Nafis Sadik, 1994. *Education for All: Summit of Nine high population countries*. New Delhi: UNESCO.
- Nancy E.Riley, 1997. "Gender, Power, and Population Change." *Population Bulletin*, 52(1). Washington DC: Population Reference Bureau Inc.

- Policy and Human Resources Development Project (PHRD), 1996a. *Ethiopian Social Sector Report: Community Consultation and Participatory Development*. Addis Ababa: EMPDA.
- Policy and Human Resources Development Project (PHRD), 1996b. *Ethiopian Social Sector Studies: Education Sector Review, Synthesis and summary*. Addis Ababa: PHRD.
- Poostchi, I., 1986. *Rural Development and the Developing Countries: An Interdisciplinary Introductory approach*. Canada, Oshawa: The Alger Press Limited
- Pressat, Roland, 1985. *The Dictionary of Demography*. Great Britain: Bail and Bain Ltd.
- Psacharopoulos, G., 1994. "Returns to Investment in Education: A Global Update". *World Development*, 1994, 22(9) 1325-1343.
- Psacharopoulos, G. and M. Woodhall, 1985. *Education for Development: An analysis of Investment Choices*. Washington, D.C.: World Bank.
- Sarkar, B.N., 1983. *Primary Education Problems*. DRU Publication No. 47. India: Demography Research Unit. (Internet Source)
- Sharma, Subhash, 1996. *Applied Multivariate Techniques*. New York: John Wiley and Sons, Inc.
- Shryock, H.S. and Siegel, J.S., 1971. *The Methods and Materials of Demography*. New York: Academic Press Inc.
- Soedijarto, Lexy Moleong, Asuryadi, Darlis Machmud, F.Pangemanan, A.F.Tongyong, N.Naoetion, and R.Murray Thomas, 1980. *Reducing the Dropout Rate in the Elementary School*. In Postlethwaite, T. Neville, and R.Murray,Thomas (eds), *Schooling in The Asian Region: Indonesia, Malaysia, The Philippines, Singapore, Thailand*. Oxford: Pergamon Press.
- Steinberg L., Blinde P.L., and Chan K.S., 1984. Dropping out among language minority Youth. *Review of Educational Research*, Vol. 54.

- Sudha.S., 1997. "Family size, Sex Composition and Children's Education: Ethnic Differentials over Development in Peninsular Malaysia." *Population Studies* 51(2), 139-151. Great Britain: Population Investigation Committee.
- Swaminathan, M. and V. Rawal, 2000. Primary Education for All. In K.S. Parikh (ed), *India Development Report 1999-2000*. Oxford; Oxford University Press.
- Sweat and Toil Of Children, 1998.  
<http://www.dol.gov.dol/ilab/public/media/reports/iclp/sweat5>.
- Tadesse, Mengesha, 1975. *Primary school Dropouts in Rural Ethiopia: Planning and Policy Implications*. Ph.D. thesis, Education Administration. University of Wisconsin. Michigan: University of Microfilms.
- Tekeste Negash, 1990. *The Crises of Ethiopian Education; Some Implications for Nation Building*. Uppsola: Uppsola University.
- Tekeste, Negash, 1996. *Rethinking Education in Ethiopia*. Uppsola:Nordska Afrkainstitutet.
- Transitional Government of Ethiopia (TGE), 1994. Education and Training Policy of Ethiopia. Addis Ababa:
- Uddin Khan, Qutab and Dieter Berstecher, 1988.*The Problems of Repetition and dropout in Basic Education in Madagascar*. Paris: Unit for Cooperation with UNICEF and WFP. UNICEF, WFP, UNESCO.
- United Nations (UN), 1958. *Multilingual Demographic Dictionary*. New York: UN.
- United Nations (UN), 1973. *The Determinants and Consequences of population Trends*. Vol. 1. New York: UN.
- United Nations, 1993. *Women's Education and Fertility Behavior: A Case Study of Rural Maharashtra, India*. New York:UN.
- UNESCO, 1994. *Education for All: Summit of Nine high population countries*. New Delhi:UNESCO.
- United Nations Children's Fund (UNICEF), 1963. *Children of the Developing Countries*. London: Thomas Nelson and Sons Limited.

- United Nations Children's Fund (UNICEF), 1984. *UNICEF in Ethiopia. Nairobi, Kenya: UNICEF.*
- United Nations Children's Fund (UNICEF), 1995. *The Progress of Nations.* New York: UNICEF House.
- United Nations, Department of International Economics and Social Affairs, 1982. *World Population Trends and policies, Vol. 1.* New York:UN.
- United Nations, Department of International Economics and Social Affairs, 1987. *Fertility Behavior in the Context of Development: Evidence from the World Fertility Survey.* New York:UN.
- United Nations Development Programme (UNDP), 1998. *Human Development Report 1998, Ethiopia.* Addis Ababa: UNDP.
- United Nations Development Programme (UNDP), 2000. *Human Development Report.* New York: Oxford University Press.
- United Nations Educational, Scientific and Cultural Organization (UNESCO), 1994. *Education for All: Summit of Nine high population counties.* New Delhi:UNESCO.
- United Nations Population Fund (UNFPA), 1999. *The State of World Population.* U.S.A.: Prographics, Inc.
- United Nations Population Fund (UNFPA), 2000a. *Women's Empowerment and Reproductive Health: Links throughout the Life Cycle.* New York: UNFPA.
- United Nations Population Fund (UNFPA), 2000b. *Working to Empower Women: UNFPA's Experience in implementing the Beijing Platform for Action.* New York: UNFPA.
- Wanna Leka and Tsion Dessie, 1994. *Educational Wastage: The case of Female Students in Selected Primary and Secondary Schools of Ethiopia.* Addis Ababa: Institute of Development Research. Addis Ababa University.
- Weeks, John R., 1989. *Population: an Introduction to Concepts and Issues.* California: Wadsworth Publishing Company.

World Bank, 1990. *Primary Education: A World Bank Policy paper*. Washington, D.C.: World Bank.

World Bank, 1998. *Ethiopia, Social Sector*. Washington, D.C.: World Bank.

Yelfign W., Zewdu D., Alemnesh H., and Anbesu B., 1995. *Study on Primary School Female Participation and Performance in Cheha District*. Addis Ababa: Ministry of Education.

## APPENDICES

### Appendix 1: Abbreviations and Acronyms

AIR	= Apparent Intake Rate
CSA	= Central Statistical Authority
DHS	= Demographic and Health Survey
E.C.	= Ethiopian Calendar
EMIS	= Education Management Information Systems
EMPDA	= Educational Materials Production and Distribution Agency
ERIC	= Educational Resources Information Centre
ESDP	= Education Sector Development Program
Eth. Birr	= Ethiopian Birr
GDP	= Gross Domestic Product
ILO	= International Labour Office
MEDAC	= Ministry of Economic Development and Co-operation
MOE	= Ministry of Education
PGER	= Primary School Gross Enrolment Ratio
PHRD	= Policy and Human Resources Development
PNER	= Primary School Net Enrolment Ratio
SNNPR	= Southern Nations Nationalities and Peoples Region
TFR	= Total Fertility Rate
UN	= United Nations
UNESCO	= United Nations Educational, Scientific and Cultural Organization
UNFPA	= United Nations Population Fund
UNICEF	= United Nations Children's Fund
USD (or US\$)	= United States' Dollar
WMS	= Welfare Monitoring Survey

## Appendix 2: Definition of technical terms

1. 
$$\text{AIR} = \frac{\text{Total Number of Pupils Enrolled in Grade One}}{\text{Total Seven Years Old Population}} \times 100$$
2. Biological or Nuclear Family consists of the husband, wife and their unmarried children (Lucas, D. et al. 1980).
3. Collective Quarter is a premise (a housing unit, a building or a compound) in which a number of unrelated persons reside together, and share common facilities. Examples of collective quarters are, hostels, monasteries, prisons, boarding schools, home for aged, children's homes, work camps, military barracks, etc.
4. Composite or Extended Family consists of more than two generations of a biological family and is found in countries where it is not the custom for children to leave the parental home on marriage (UN, 1958).
5. Demography is defined in several ways according to several demographers. Some of the definitions are given here.

*Demography is the statistical and mathematical study of the size, composition, and spatial distribution of human populations, and of changes over time in these aspects through the operation of the five processes of fertility, mortality, marriage, migration, and social mobility. Although it maintains a continuous descriptive and comparative analysis of trends, in each of these processes and in their net result, its long-run goal is to develop a body of theory to explain the events that it charts and compares (Bogue, 1969: 1-2). Population composition refers not only to characteristics such as age, sex, and marital status but also to health and occupation. Social mobility involves changes in status e.g. through marriage and migration (Hauser and Duncan, 1959: 2).*

*Demography is the study of human populations in relation to the changes brought about by the interplay of births, deaths, and migration. When it is treated as Population Studies*

or Social Demography, it implies a wider frame of reference drawing in work from related fields. The scope of demographic work can be seen as falling into three main areas:

- (i) *The size and makeup of populations according to diverse criteria such as age, sex, marital status, spatial distribution etc. In short pictures of a population at a fixed moment.*
- (ii) *The different processes which directly influence this composition (fertility, mortality, nuptiality, migration, etc).*
- (iii) *The relationships between these static and dynamic elements and the social, economic and cultural environment within which they exist.*

*The diversity of subject matter and techniques is such that the discipline can in fact be regarded as a series of sub-disciplines, loosely united by a central core of techniques. Among these sub-disciplines are Economic Demography, Historical Demography, and Mathematical Demography. Works dealing with population theory and population policy are also distinguished as separate subject areas, while Genetics and Epidemiology are outside disciplines with close links to certain forms of demographic research. The study of Marriage has long been part of demographic analysis (Pressat, 1985: 164-165)*

*Demography is the study of the size, territorial distribution, and the composition of population, changes therein, and the components of such changes, which may be identified as mortality, territorial movement (migration), and social mobility (change of status) (Hauser and Duncan, 1959:2).*

6. Dropout Rate =  $\frac{\text{Total Number of Dropouts}}{\text{Total Number Enrolment}} \times 100$

7. Deviation contrast in logistic regression analysis compares the effect of each category to the average effect of all categories of the covariate.

8. Education Expenditure refers to the expenditure on the provision, management, inspection, support and subsidiary services of education.
9. Educational policies can be evaluated in terms of effectiveness and efficiency. Policy effectiveness asks, “does the policy produce the desired results?” Policy efficiency asks, “are those results obtained at the least possible amount of cost?”
10. Enumeration Area (EA) is a unit of land delineated for the purpose of enumerating housing units and population without omission and duplication. According to CSA, an EA in rural areas usually consists of 150 to 200 households. On the other hand, an EA in urban centres constitutes 150 to 200 housing units.
11. “Family is defined as those members of the household who are related, to a specific degree, through blood, adoption, or marriage.” (UN, 1958).
12. Gross Domestic Product (GDP) is the total output of goods and services for final use produced by an economy, by both residents and non-residents, regardless of the allocation to domestic and foreign claims. It does not include deductions for depreciation of physical capital or depletion and degradation of natural resources.
13. Gross National Product (GNP) is GDP plus net factor income from abroad, which is the income received by residents from abroad for factor services (labour and capital), less similar payments made to non-residents who contribute to the domestic economy.
14. Head of a household is a person who economically supports or manages the household or for reasons of age or respect, is considered as head by the household or declares himself as such or by members of the household. The head of household can be a male or a female.
15. Household is a group of individuals who share living quarters and their principal meals (UN, 1958). Household size is defined as the number of members of a household.  
For the present study household constitutes a person or group of persons, irrespective of whether related or not who normally live together in the same housing unit or group of housing units and who have common cooking arrangements. Member of a household is a person who constitutes a household. In the present study, on the basis of CSA’s definition, the following are considered as members of a household.

- (i) All persons who lived and ate with the household for at least six months including those who were not within the household at the time of survey and were expected to be absent from the household for less than six months.
  - (ii) All guests and visitors who ate and stayed with the household for six months and more.
  - (iii) Housemaids, guards, babysitters, etc who lived and ate with the household even for less than six months.
16. Human Development Index (HDI) is an index that measures the average achievement of a country in basic human capabilities by indicating whether people lead a long life, are educated and knowledgeable and enjoy a decent standard of living.
17. Indicator contrast in logistic regression analysis compares the effect of each category to the effect of a reference category.
18. Likelihood is the probability of the observed results given the parameter estimates. Likelihood of a model is defined as the probability that the estimated hypothesised model represents the input data.
19. Numeracy rate is the ratio of literate persons who have rudimental arithmetic capability to all literate persons in that group.
20. Primary education, refers to schooling from grade 1-8.
21. Primary school pupil's age grade mismatch is a situation that exists when a pupil more than 14 years old is enrolled in primary school. That means the school cycle in which the pupil was enrolled was below the school cycle which would normally be expected for her/his age. The standard official primary school age in Ethiopia is 7-14.
22. Primary school pupil dropout rate and primary school pupil attrition rate, are taken as the same throughout this work.
23. 
$$PGER = \frac{\text{Total Number of Pupils Enrolled in Primary Schools}}{\text{Total Population Aged (7-14)}} \times 100$$

24. 
$$\text{PNER} = \frac{\text{Total Number of Pupils Aged (7-14) Enrolled in Primary Schools}}{\text{Total Population Aged (7-14)}} \times 100$$

25. Real GDP per-capita (PP\$) is the GDP per-capita of a country converted into US\$ on the basis of the purchasing power parity exchange rate.

26. Urban Centre is in principle in Ethiopia is defined as a locality with 2000 or more inhabitants. However, according CSA, an urban centre in this study includes the following regardless of the number of inhabitants.

- (i) All administrative capitals (Regional capitals, Zone capitals, and Wereda capitals),
- (ii) Localities with Urban Development Associations (UDA) not included in (i) above,
- (iii) All localities which are not included either in (i) or (ii) above having a population of 1000 or more persons, and whose inhabitants are primarily engaged in non-agricultural activities.

27. Urban Development association (UDA), is the lowest administrative unit in urban centre with its own jurisdiction. It is an association of urban dwellers (commonly known as Kebele) formed by the inhabitants, and usually constitutes a part of the urban centre (CSA, 1998).

## DECLARATION

I, the undersigned, declare that the thesis is my original work, has not been presented for a degree in any other university and that all sources of material used for the thesis have been duly acknowledged.

Name: Berhan Hailu Ebuy

Signature: 

Place: Demographic Training and Research Centre (DTRC), Institute of Development Research (IDR), Addis Ababa University, Addis Ababa, Ethiopia.

Date of Submission: June, 2001.

### Approved by

1. Dr.P.K.Murthy  
Advisor

  
Signature

27/6/2001  
Date