

Report No. 36434-ET

# Ethiopia

## Capturing the Demographic Bonus in Ethiopia: Gender, Development, and Demographic Actions

June 27, 2007

Poverty Reduction and Economic Management 2 (AFTP2)  
Country Department for Ethiopia  
Africa Region



Document of the World Bank

---

## GOVERNMENT FISCAL YEAR

July 8 - July 7

## CURRENCY EQUIVALENTS

(Exchange Rate Effective as of May 30, 2007)

Currency Unit	Ethiopian Birr (ETB)
US\$1.00	= ETB 8.9792
Birr 1.00	= US\$ 0.1114

## WEIGHTS AND MEASURES

Metric System

## ABBREVIATIONS AND ACRONYMS

ASFR	Age-specific Fertility Rate
ASMR	Age-Specific Mortality Rate
BCC	Behavior Change Communication
BKKBN	Indonesia Family Planning Coordinating Board ( <i>Badan Koordinasi Keluarga Berencana Nasional</i> )
CBD	Community-Based Distribution
CBR	Crude Birth Rate
CBRHA	Community-Based Reproductive Health Agent
CD	Coale and Demeny Model Life Table
CDR	Crude Death Rate
CHC	Community Health Clinic
CHS	Child Health Survey
CGE	Computable General Equilibrium Model
CMR	Child Mortality Rate
CORHA	Consortium of Reproductive Health Associations
CPR	Contraceptive Prevalence Rate
CPS	Contraceptive Prevalence Survey
CSA	Central Statistical Authority
CSAE	Centre for the Study of African Economies
CSAg	Central Statistical Agency
CSM	Commercial Social Marketing
CYP	Couple Year of Protection
DFID	UK Department for International Development
DHS	Demographic and Health Survey
DRC	Democratic Republic of Congo
ESW	Economic and Sector Work
EC	Ethiopian Calendar
EGLDAM	Association for the Elimination of Harmful Traditional Practices in Ethiopia ( <i>Ye Ethiopia Goji Limadawi Dirgitoch Aswegaj Mahiber</i> )
ET	Ethiopia
ETB	Ethiopian Birr
EU	European Union
FAO	Food and Agriculture Organization
FDRE	Federal Democratic Republic of Ethiopia
FGAE	Family Guidance Association of Ethiopia
FGC	Female Genital Cutting

FP	Family Planning
FPE	Family Planning Effort
FWA	Female Welfare Assistant
GDP	Gross Domestic Product
GE	General Equilibrium
GF	Gulf Family
GoE	Government of Ethiopia
GTZ	German Agency for Technical Cooperation ( <i>Deutsche Gesellschaft für Technische Zusammenarbeit</i> )
ha	Hectare
HEW	Health Extension Worker
HFS	Health Facility Survey
HIV/AIDS	Human Immuno-deficiency Virus/Acquired Immuno-Deficiency Syndrome
HS	Health Survey
HSDP	Health Sector Development Program
HSEP	Health Service Extension Program
ICOMP	International Council on Management of Population Programmes
ICPD	International Conference for Population and Development
IDP	Internally Displaced Person
IEC	Information, Education, and Communication
IFPRI	International Food Policy Research Institute
IMR	Infant Mortality Rate
IPPF	International Planned Parenthood Federation
IUCD	Intrauterine Contraceptive Device
IUD	Intrauterine Device
JSI	John Snow International
KAP	Knowledge, Attitude, and Practice
KfW	German Funding Agency for International Development ( <i>Kreditanstalt für Wiederaufbau</i> )
LE	Life Expectancy
MAMS	Maquette for MDG Simulation
MCH	Maternal and Child Health
MDGs	Millennium Development Goals
M/F	Male/Female
MOA	Ministry of Agriculture
MOE	Ministry of Education
MOFED	Ministry of Finance and Economic Development
MOH	Ministry of Health
MOLSA	Ministry of Labour and Social Affairs
MR	Mortality Rate
MSI	Marie Stopes International
MSIE	Marie Stopes International-Ethiopia
MT	Metric Ton
MTEF	Medium-Term Expenditure Framework
M&E	Monitoring & Evaluation
n.a.	Non Available
n.d.	No Date
NCAPD	National Coordinating Agency for Population and Development
NF	National Fertility
NFS	National Fertility Sample Survey
NGO	Non-governmental Organization
No.	Number
NOP	National Office of Population
NOP/PD	National Office of Population/Population Department
NPC	National Population Council
NPP	National Population Policy

NPV	Net Present Value
NTS	Non Technical Staff
OCP	Oral Contraceptive Pill
PA	Peasant Association
PADETES	Participatory Demonstration and Training Extension System
PASDEP	Plan for Accelerated and Sustained Development to End Poverty
PD	Population Department
PER	Public Expenditure Review
PHCU	Primary Health Care Unit
PIE	Pathfinder International Ethiopia
PM	Prime Minister
POA	ICPD Program of Action
Pop/RH	Population and Reproductive Health
PRSP	Poverty Reduction Strategy Paper
RH	Reproductive Health
RH/FP	Reproductive Health/Family Planning
ROP	Regional Office of Population
RP	Research Paper
RPC	Regional Population Council
SDPRP	Sustainable Development and Poverty Reduction Program
SMART	Specific, Monitorable, Achievable, Realistic, and Time-bound
SNNPR	Southern Nations, Nationalities, and People's Region
SSA	Sub-Saharan Africa
STI	Sexually Transmitted Infection
TFP	Total Factor Productivity
TGE	Transitional Government of Ethiopia
TFR	Total Fertility Rate
TS	Technical Staff
UK	United Kingdom
UN	United Nations
UNAIDS	Joint United Nations Programme on HIV/AIDS
UNIFEM	United Nations Development Fund for Women
UNP	United Nations Publications
UNFPA	United Nations Population Fund
US	United States
USAID	United States Agency for International Development
US\$	US Dollar
U5MR	Under-five Mortality Rate
WAC	<i>Woreda</i> Advisory Committee
WFS	World Fertility Survey
WHO	World Health Organization
WMS	Welfare Monitoring Survey

Vice President:	Obiageli Katryn Ezekwesili
Country Director:	Ishac Diwan
Sector Manager:	Kathie Krumm
Task Team Leaders:	Luc Christiaensen and John F. May



## TABLE OF CONTENTS

ACKNOWLEDGEMENTS.....	I
EXECUTIVE SUMMARY .....	II
INTRODUCTION .....	1
<b>PART I: POPULATION IN PERSPECTIVE – PEOPLE, POVERTY, AND POLICIES.....</b>	<b>5</b>
<b>CHAPTER 1. THE DEMOGRAPHIC PROFILE.....</b>	<b>6</b>
1.1 Ethiopia is a Demographic Giant.....	6
1.2 Young People Dominate the Population Resulting in a High Dependency Ratio .....	7
1.3 The Population is rapidly Expanding.....	9
1.4 People Live Concentrated in the Rural Highlands.....	12
<b>CHAPTER 2. POPULATION AND POVERTY .....</b>	<b>18</b>
2.1 The Burdens and Benefits of an Evolving Age Structure.....	19
2.2 Population Growth and Population Pressure: Malthus or Boserup?.....	23
<b>CHAPTER 3. POPULATION POLICIES IN PRACTICE .....</b>	<b>27</b>
3.1 The 1993 National Population Policy.....	27
3.2 Institutional Arrangements .....	30
3.3 NPP Implementation Record .....	34
3.4 Delivery of Family Planning Services.....	35
<b>CHAPTER 4. CONCLUDING REMARKS .....</b>	<b>40</b>
<b>PART II: POPULATION GROWTH, DEVELOPMENT, AND CONTRACEPTION .....</b>	<b>43</b>
<b>CHAPTER 5. MORTALITY RATES IN PERSPECTIVE .....</b>	<b>45</b>
5.1 The Dynamics of Mortality .....	46
5.2 Socio-Economic Determinants of Child Mortality .....	50
<b>CHAPTER 6. DETERMINANTS OF FERTILITY .....</b>	<b>55</b>
6.1 Key Features of Fertility in Ethiopia .....	55
6.2 Unbundling Fertility – A Conceptual Framework.....	58
6.3 Structural Analysis of the Determinants of Fertility.....	60
6.3.1 Proximate Determinants of Fertility—the Bongaarts Model.....	60
6.3.2 What Has Driven Fertility Changes Over the Past Decade?.....	63
6.3.3 Determinants of Being in Union.....	65
6.3.4 Determinants of Contraceptive Use .....	71
6.4 Intermediate Determinants of Fertility .....	82
6.4.1 Socio-Economic Determinants of Fertility.....	82
6.4.2 Effectiveness of Family Planning in Reducing Fertility.....	88
<b>CHAPTER 7. ETHIOPIA’S POPULATION TOMORROW - DEVELOPMENT AND CONTRACEPTION.....</b>	<b>94</b>
7.1 The Demographic Outlook under Different Population Growth Scenarios.....	95
7.2 The Cost-Effectiveness of Family Planning .....	104
<b>CHAPTER 8. CONCLUDING REMARKS .....</b>	<b>115</b>

<b>PART III: CAPTURING THE DEMOGRAPHIC BONUS THROUGH DEVELOPMENT AND DEMOGRAPHIC ACTIONS .....</b>	<b>120</b>
<b>CHAPTER 9. PROMOTING EQUITABLE DEVELOPMENT .....</b>	<b>122</b>
9.1 Enhancing the Educational Attainments of Adult Women.....	122
9.2 Promoting Gender Equity and Empowerment.....	124
<b>CHAPTER 10. TOWARD A MORE ENABLING POPULATION POLICY ENVIRONMENT.....</b>	<b>127</b>
10.1 High Level Advocacy and Leadership.....	127
10.2 Better Financing Arrangements .....	131
10.3 Institutional Arrangements .....	132
10.4 Monitoring and Evaluation Systems.....	136
<b>CHAPTER 11. TOWARD A RAPID INCREASE IN FAMILY PLANNING SERVICES.....</b>	<b>138</b>
11.1 Benefits of Family Planning .....	138
11.2 Demand for Family Planning Services .....	138
11.3 Access to Family Planning Services.....	139
11.4 Increasing the Availability of Contraceptives.....	146
11.5 Improving the Quality of Family Planning Services .....	148
11.6 The Way Forward.....	149
<b>CHAPTER 12. CONCLUDING REMARKS .....</b>	<b>152</b>
APPENDICES .....	154
Appendix A: Trends in Contraceptive Use in Selected Sub-Saharan Countries.....	154
Appendix B: Descriptive Statistics of the Covariates of Fertility and Marital Status.....	156
Appendix C: Description of Pathfinder Survey 2004 .....	157
Appendix D: Methodological Considerations in Estimating the Effect of Family Planning.....	159
Appendix E: Estimated Results on the Determinants of Birth in the Past 3 Years.....	161
<b>REFERENCES.....</b>	<b>163</b>

### LIST OF BOXES

Box A: The Demand for Contraceptives is Rising.....	xii
Box 7.1: Population Projections Assumptions .....	100
Box 7.2: Structural Features of the MAMS Model .....	107
Box 7.3: The Cost of Family Planning in Ethiopia .....	109
Box 9.1: Provision of Low-Cost Child Care to Foster Female Labor Market Participation.....	125
Box 10.1: Faith-Based Organizations and Religious Leaders Advocate against Early Marriage .....	129
Box 10.2: Population Issues get Attention in the Ethiopian Parliament .....	131
Box 10.3: Population Intervention Synergies among Various Sectors and Ministries.....	134
Box 10.4: SNNPR is moving Faster on Population Issues.....	135
Box 11.1: The Success of Community-Based Reproductive Health Agents (CBRHAs).....	143
Box 12.1: The Case of Indonesia .....	152
Box 12.2: The Case of Bangladesh .....	153

## LIST OF FIGURES

Figure A: Under the Low Population Growth Scenario People are on Average Richer and Fewer People Live in Poverty .....	ix
Figure 1.1: Population Pyramid, 2005.....	8
Figure 1.2: Increase of Ethiopian Population, 1900-2005 (million) .....	9
Figure 1.3: Annual Population Growth Rate, 1900-2005 (percent) .....	10
Figure 1.4: Crude Death Rate and Crude Birth Rate, 1950-2005 (per 1,000).....	12
Figure 1.5: Map of Ethiopia .....	13
Figure 1.6: Map of the Regions of Ethiopia.....	14
Figure 2.1: The Demographic Transition and the Changing Age Structure.....	20
Figure 2.2: Agricultural Performance in Ethiopia, 1990-2004.....	24
Figure 3.1: Organizational Structure of the Population Department at MOFED .....	32
Figure 3.2: Organizational Structure of the Ministry of Health .....	33
Figure 3.3: Structure of the Public Health Delivery System.....	37
Figure 3.4: Donors' Expenditures for Population Assistance in Ethiopia, by Channel of Distribution,.....	38
Figure 3.5: Government Expenditures on Population Programs by Activity in Sub-Saharan Africa, 2001 .....	39
Figure 5.1: Life Expectancy and Crude Death Rates in Ethiopia, 1955-2005 .....	45
Figure 5.2: Mortality Rates by Age in Ethiopia, 2000 .....	46
Figure 5.3: The Relation between the CDR and IMR in Ethiopia, 1955-2005 .....	48
Figure 6.1: Total Fertility Rates in Selected Sub-Saharan African Countries 1990 and 2003 .....	57
Figure 6.2: Total Fertility Rates in Ethiopia by Selected Background Characteristics .....	57
Figure 6.3: Cumulative Fertility and Education in Ethiopia by Age Group.....	58
Figure 6.4: Proximate Determinants, Intermediate Determinants, and Fertility .....	60
Figure 6.5: Total Fertility Rate Responses to Contraceptive Use, Holding other Factors Unchanged .....	65
Figure 6.6: Marriage Rates by 15 and 19 years, by Age Group and Residence.....	66
Figure 6.7: Cumulative Fertility by Age at Marriage and Age Cohort .....	66
Figure 6.8: Contraceptive Prevalence and Unmet Needs in Selected Sub-Saharan Countries .....	73
Figure 6.9: Unmet Needs for Contraception in Ethiopia.....	74
Figure 7.1: The Evolution of the Population under High and Low Population Growth Scenarios, 2000-2030 (million).....	101
Figure 7.2: Evolution of the Dependency Ratio under High and Low Population Growth Scenarios, 2000-2030.....	104
Figure 7.3: Evolution of Ethiopia's GDP (billion 2005 ETB) and Household Consumption per Capita (2005=100) under a High <sup>1)</sup> and Low Population Growth Scenario.....	111
Figure 7.4: The Number of People in Poverty under High <sup>1)</sup> and Low Population Growth Scenarios, 2005-2030 (million).....	112
Figure 7.5: Evolution of Government's Spending and Population Size under High <sup>1)</sup> and Low Population Growth Scenarios, 2005-2030 .....	113
Figure 11.1: Disconnect between Awareness and Accessibility of Contraceptives.....	139
Figure 11.2: Contraceptive Forecasts and Funding Requirements.....	146

## LIST OF TABLES

Table 1.1: Key Data for Ethiopia, Neighboring, and Other Big Countries in Sub-Saharan Africa.....	7
Table 1.2: Sex Ratios and Dependency Ratios in Ethiopia, 2005 .....	9
Table 1.3: Mortality and Fertility Indicators for Ethiopia, Neighboring, and Other Big Countries in Sub-Saharan Africa, 2005.....	11
Table 1.4: Distribution of the Ethiopian Population among the Regions.....	13
Table 1.5: Population Density by Regions in Ethiopia .....	15
Table 1.6: Migration by Regions and Sex, Recent and General.....	15
Table 1.7: Migration by Regions, Urban rural, Recent and General.....	15
Table 1.8: Migration Patterns in 1984, 1994, and 1999 (percent).....	16
Table 1.9: Estimated Numbers of IDPs in Ethiopia per Regions .....	17
Table 3.1: Synopsis of the National Population Policy of Ethiopia .....	35
Table 5.1: Age Structure of the Ethiopian Population, Age-Specific Mortality Rates (per 1,000), and Contribution to CDR by Age, 2000.....	47
Table 5.2: HIV Prevalence Rate of Adults aged 15-49 (percent) in Selected Sub-Saharan Countries .....	49
Table 5.3: Socio-Economic Determinants of Under-Five Child Mortality in Rural and Urban Areas of Ethiopia .....	50
Table 6.1: Evolution of Total and Age-Specific Fertility Rates in Ethiopia, 1984-2005 .....	56
Table 6.2: TFRs and ASFRs by Residence and Wealth, 1990-2005.....	58
Table 6.3: Proximate Determinants of TFRs in Ethiopia and Estimated Total Fecundity, 2000 and 2005 .....	62
Table 6.4: Indices of Proximate Determinants of TFRs by Residence, 1990-2000 .....	63
Table 6.5: Relative Contribution of Different Proximate Determinants to the Decline in Fertility by Residence in Ethiopia, 1990-2000.....	64
Table 6.6: Marriage, Location, and Cumulative Fertility.....	67
Table 6.7: Marriage Determinants.....	69
Table 6.8: Predicted Effect of Education and Urbanization on Marriage and Marriage on TFRs.....	71
Table 6.9: Correlates of Current Contraceptive Use, Women 15-49 Correlates of Current Contraceptive Use, Women 15-49.....	75
Table 6.10: Employment, Cash Earnings, and Decision Power over Cash Earnings among Women of Childbearing Age in Ethiopia.....	78
Table 6.11: Current Contraceptive Use Rates in 2004 among Women 15-49 and Family Planning Availability in PAs/ <i>kebeles</i> .....	80
Table 6.12: Simulations Based on the Structural Model.....	82
Table 6.13: Correlates of Fertility, Women 15-49 .....	84
Table 6.14: Children Born, Rural Women 15-49.....	86
Table 6.15: Children Born, Urban Women 15-49 .....	87
Table 6.16: Impact of Family Planning on Total Children Born in 2004 .....	91
Table 7.1: The Fertility Transition in Ethiopia Given Current Development Plans, 2000-2030 .....	96
Table 7.2: The Evolution of Child Mortality in Ethiopia Given Current Development Plans, 2000-2030.....	98
Table 7.3: Evolution of the Demographic Profile High Fertility - High Mortality Scenario, 2000-2030 .....	102
Table 7.4: Evolution of the Demographic Profile Low Fertility - Low Mortality Scenario, 2000-2030 .....	103
Table 7.5: Evolution of Economic Indicators under High and Low Population Growth Scenarios, 2005-2030.....	110
Table 10.1: The Distribution of Scores for Policy, 1994-2002 .....	128
Table 11.1: Average Distances to Hospitals/Health Centers/Health Clinics (km).....	140
Table 11.2: Characteristics of PAs/ <i>kebeles</i> by percent of Family Planning Users in the PA/ <i>kebele</i> .....	141
Table 11.3: Distribution of Method-Mix between the two DHS Surveys among all Married Women .....	148

## ACKNOWLEDGEMENTS

Substantial changes have taken place in the population field over the past years in Ethiopia, following a renewed interest in the role of demographic issues in development. This report seeks to capitalize on this evolution and chart a way forward together with the National Office of Population (NOP) and later the Population Department (PD) of the Government of Ethiopia, the official counterpart of the study, and the multiple stakeholders. The team would like to express its gratitude for the numerous occasions it was provided to interact with them to deepen its understanding, sharpen its arguments, and fine tune its suggestions.

The study began with a series of meetings and brainstorming sessions with the Government of Ethiopia, the development partners, NGOs, and civil society in Addis Ababa followed by field visits in SNNPR, Amhara, and Addis Ababa. Following these consultations, the key themes of the report were articulated in a Concept Note which was discussed with the NOP and the stakeholders. In March 2006, the first draft was discussed with colleagues at the World Bank, followed by a one-day consultative workshop in Addis Ababa with representatives from the Government, international organizations, bilateral donors, NGOs, and civil society. The report was revised and presented at the National Symposium on “Population Issues and the PASDEP: From Concept to Action” in July 2006.

The team, which was composed of economists, demographers, and reproductive health specialists to reflect the multi-disciplinary nature of the topic, would in particular like to thank H.E. Ato Mekonnen Manyazewal, State Minister at the Ministry of Finance and Economic Development (MOFED), Ato Hiruy Mitiku, former Head of the National Office of Population at MOFED, and Wzo. Genet Mengistu, Head of the Population Department of MOFED, for their continuous support of the study as well as the Central Statistical Agency (CSAg) and ORC Macro International for clarifying the population data, making the Demographic and Health Survey (DHS) 2000 data available, and sharing the results of the DHS 2005 with the team. The team is grateful to Pathfinder International for sharing the results of a survey on family planning conducted in 2004 (the Pathfinder Survey 2004) and arranging for the follow-up Facility Survey. It would further like to gratefully acknowledge the generous financial, administrative, and moral support received from the Packard Foundation as well as the continuous encouragement and input of USAID and UNFPA during the preparation of this report. The team is furthermore indebted to the Danish Consultancy Trust Fund and the Bank-Netherlands Partnership on Poverty Reduction for financing inputs into this report.

The core team of this report includes Luc Christiaensen and John F. May (Task Team Leaders), Kathleen Beegle, and Elizabeth Lule. Important inputs were provided by Rahimaisa Abdula, Daniel Assefa, Alok Bhargava, Kiyomi Horiuchi, Hans Lofgren, Yared Mekonnen, Claus Pörtner, and Sangeeta Raja. Excellent research, administrative, and editorial assistance by Eyerusalem Fasika, Reem Hafez, Dora Harris, Senait Kassa, Marjorie Kingston, and Alex van Duinen is gratefully acknowledged. Mary-Ann Abeyta-Behnke, Oladele Arowolo, Anwar Bach-Baouab, Tesfanesh Belay, Eduard Bos, Behailu G/Medhin, Tom Goliber, Jean-Pierre Guengant, Sahlu Haile, Gebreselassie Okubagzhi, Monique Rakotomalala, Agnès Soucat, John Stover, and Charles Teller provided important feedback and support. Invaluable guidance and suggestions were given by Ishac Diwan and Kathie Krumm and by peer reviewers Khama O. Rogo and Ato Sisay Worku. Many helpful comments and suggestions were further received from numerous colleagues at the World Bank and elsewhere.

## EXECUTIVE SUMMARY

1. **Background.** With average land holdings per rural person estimated at only 0.21 ha in 1999, down from 0.50 ha in the 1960s, and without a substantial increase in yields, population pressure is reaching critical levels. Land holdings are becoming too small to sustain households, which Ethiopia's 2005 participatory poverty assessment cites as an important cause of poverty. A growing group of people is annually in need of food aid, currently estimated at 5 to 7 million.<sup>1</sup> These developments culminated in 14 million people being threatened by drought-related famine in 2003. While a major humanitarian crisis was averted, it instigated renewed attention to demographic considerations in fostering economic growth and reducing poverty in Ethiopia.

2. **Ethiopian demography in numbers:**

- ✓ **Since 1990, population growth in Ethiopia has declined from about 3 to 2.5 percent per year in 2005.** *The expected number of children per women is estimated at 5.7 in 2005, somewhat above the Sub-Saharan African average of 5.3, though over the past 15 years the total fertility rate has been declining at a slightly faster pace than in other sub-Saharan African countries following a postponement in the age at marriage and an increase in contraceptive use.*
- ✓ **Nonetheless, Ethiopia is already a demographic giant, and at the current rate its population is bound to double in 27 years.** *Ethiopia's population was estimated at 78 million people in 2005, the second most populated country in sub-Saharan Africa, and it is expected to expand by more than two million people every year. Fertility is almost twice as high in rural as in urban areas. Surprisingly, it is below replacement level<sup>2</sup> in Addis Ababa.*
- ✓ **Agricultural growth struggles to keep up with population growth.** *Despite concerted efforts to foster the adoption of land saving technologies average agricultural growth per GDP has been flat between 1990 and 2004. More recently, agricultural growth appears to be accelerating. Nonetheless, already 20 percent of the rural households have not enough land to produce half of their caloric needs given current technologies. A land poor class is emerging.*
- ✓ **Female education and empowerment are critical determinants of fertility behavior.** *Providing all girls with at least four years of primary education by 2015 and assuming that about half of all 15-19 year old women would have some secondary education by 2030 was estimated to reduce the TFR by more than 2 children per women from 5.9 in 2000 to 3.8 in 2030, assuming the supply in contraceptives keeps up with the ensuing increase in demand.*

---

<sup>1</sup> The number of people who are "chronically food insecure" is estimated at 8.3 million (World Bank, 2006c: 42).

<sup>2</sup> Replacement fertility is estimated at 2.1 children per woman, assuming favorable mortality conditions.

- ✓ **Fertility preferences have been changing, even in rural areas, as illustrated by the substantial unmet demand for contraceptives.** *About 5 in 10 married women expressed needs for family planning services in 2005, though only 1.5 out of 10 married women currently use contraception often due to supply constraints.*
- ✓ **There are substantial welfare gains from more concerted expansion of family planning services.** *The net present value of the per capita welfare gain from increasing the contraceptive prevalence rate from 8.1 percent in 2000 to 44.7 percent in 2030 as opposed to 35.1 percent was estimated at about US\$112, about equal to one year of consumption. Consequently, there would be 1.5 to 3 million people less in poverty from 2010 onwards.*

3. **The study addresses three overarching questions.** First, how do population growth and economic development interact and would Ethiopia stand to gain from a more rapid decline in fertility? Second, what is the relative role of broad development-oriented policies and investments (such as those related to education, infrastructure, agriculture, the environment, and gender equity) versus more population-specific policies and interventions including family planning services in addressing fertility behavior? Third, how could population-specific policies and investments be strengthened to accelerate the fertility transition?

4. **The central thesis of the report** is that while high population growth puts initially a burden on economic growth and poverty reduction through higher dependency ratios, lower savings, and increased land pressure, it also generates favorable conditions for accelerated economic growth later on. When fertility rates begin to decrease rapidly, and do so faster than mortality rates, the proportion of working age people in the total population increases. The welfare benefits from this process could be substantial with increased household savings and investments, and accelerated economic growth. It is this demographic bonus or dividend that the Government of Ethiopia (GoE) may want to capture sooner rather than later by accelerating the fertility transition accompanied by employment intensive growth. While gender equitable development will go a long way in reducing fertility, the report contends that there are substantial welfare and poverty gains at the margin from complementing these efforts with concerted efforts to vigorously implement the population policy and more rapidly enhance access to, and quality of, family planning services. Nevertheless, reducing fertility and population growth is by nature a slow process, underscoring the need for immediate action. The existing pent-up demand for contraceptives presents the ideal environment for kick starting the acceleration of the fertility decline.

5. **Methodological approach.** To address how population growth and economic development interact, the study interprets and illustrates key hypotheses from the economic and demographic literature within the Ethiopian context. Applying micro-econometric estimation techniques and macro-economic modeling devices to Ethiopia-specific data sets, it then estimates the relative contribution both from overall development and population-specific interventions in reducing child mortality and fertility. Finally, the Delphi technique was applied to identify bottlenecks and assess progress in implementing ongoing population-specific interventions.

6. **Information base.** To assess the basic demographic profile, the study draws heavily on the latest 1994 Census, which is by now somewhat outdated, as well as the Demographic and Health Surveys 2000 and 2005. This information base is adequate, given the focus on population and development dynamics rather than on calibrating the exact size of the population. The DHS surveys form the core information base for estimating the effect of the different determinants of child mortality and fertility. A fertility survey conducted in 2004 (the Pathfinder Survey 2004) was further augmented with a facility survey to analyze the effect of access to family planning on fertility within the Ethiopian context. An in-depth understanding of the implementation of the population policy and the provision of family planning was obtained through numerous expert interviews and field visits.

### ***A Young Rapidly Growing Population Living Concentrated in the Rural Highlands***

7. **Ethiopia's population continues to grow rapidly by an estimated 2 million people annually.** Since the beginning of the 20<sup>th</sup> century, the population has increased more than seven times, from 10 million to nearly 78 million in 2005—making Ethiopia the second most populous country in sub-Saharan Africa (SSA) after Nigeria. Following a decline in child mortality rates, population growth accelerated in the 1950-60s to peak at 3 percent per year in 1990, declining to 2.5 percent per year in 2005. These developments resulted in a very young population and a high dependency ratio. Nearly 44 percent of the Ethiopian population is under 15 years, and only 3.1 percent is over 65.

8. **People live concentrated in the rural Highlands.** Only 15 percent of Ethiopia's population live in urban areas and most of its rural population is concentrated in the Highlands. Fertile land is still available in the Lowlands, though they are not well supplied by infrastructure and many areas are malaria-infested. They also suffer from the presence of the tsetse fly, a vector for *trypanosomiasis*, preventing the use of oxen traction. Cultural differences between the low- and highlanders further hinder intraregional migration. Finally, migration to urban areas has been discouraged to avoid mass poverty; the true extent of rural-urban migration will become better understood with the results of the Population and Housing Census which was conducted in May 2007.

### ***Rapid Population Growth—Curse or Blessing?***

9. **A Malthusian reading of Ethiopia's current situation does have some appeal.** The rapid expansion of the population in the absence of intraregional migration went hand in hand with an increase in land pressure and environmental degradation. Nonetheless, the adoption of land saving technologies such as fertilizer and improved seeds remains limited, and over the past 15 years growth in agricultural GDP has barely kept pace with population growth despite recent signs of an upturn in agricultural output. In 2003, about 13-14 million people were threatened with starvation and it is estimated that 5 to 7 million people annually are in need of food aid to survive. Clearly, Malthusian forces (such as epidemics and famines) to restore mortality rates to their original levels and restore the original land-labor ratio appear to be at work. Fortunately, major human disasters have been averted through substantial international assistance and regular, and at times massive, amounts of food aid. In addition, voluntary reduction in fertility, through delays in age at marriage, another key response posited by Malthus to slow down population



growth, has been observed especially in SNNPR, the most densely populated region. The desire to reduce fertility is also apparent from the high percentage of unmet demand for contraceptives.

10. **Nonetheless, Boserupian type responses are also happening, albeit with limited success so far.** As argued by Ester Boserup, increasing population pressure may generate the necessary conditions to boost agricultural production, by changing the land-labor and capital-labor ratio, and thus the relative factor prices. These changes have historically been observed to induce change in agricultural technology as well as change in the institutions necessary to facilitate their adoption, especially those related to property rights. The GoE's efforts to enhance the use of land saving technologies such as modern inputs as well as its latest adaptations to the land policy to generate more secure and transferable land tenure rights could be seen as Boserupian-like responses to Ethiopia's increasing population pressure. However, more concerted efforts by policy-makers to induce the technological and institutional changes necessary for a sustained acceleration of agricultural growth are called for, especially since soil degradation, one of the reasons for the lackluster performance of agriculture over the past 15 years, is often irreversible.

#### *Ethiopia at the Brink of the Fertility Transition with a Demographic Bonus in Sight*

11. **Ethiopia finds itself on the verge of the second phase of the demographic transition.** The decline in overall mortality levels, the first stage of the demographic transition, is usually followed by the onset of fertility decline, the second phase of the demographic transition (triggering a reduction of population growth if fertility declines faster than mortality). Ethiopia seems to have started the latter process—fertility has declined from 6.4 children per woman in 1990 to 5.7 in 2005. However, fertility will need to decline substantially more to be in equilibrium with the declining levels of mortality, and to slow population growth.

12. **Along with the demographic transition comes a change in the age structure of the population providing prospects for a demographic bonus.** As population growth takes off in response to the decline in child mortality, the dependency ratio increases, yielding relatively fewer workers, while the demand for social services (especially education and health) and thus fiscal pressures increase thereby hampering economic growth. Ethiopia has been going through this process over the past decades. When Government's expenditures are financed through increased taxation or domestic borrowing, it may crowd out private saving, investment, and consumption, leading to a reduction in economic growth and welfare. Yet, when followed by a decline in fertility, population growth will slow down, dependency ratios will decline, young people reaching working age will boost the labor force, and savings and investment rates may increase. The demographic change also reduces the demand for social services allowing a rebalancing of public spending on human and physical capital. Together these evolutions may provide the country with a (temporary) demographically induced economic growth bonus, called the demographic bonus or dividend. As the demographic transition proceeds further to a low mortality and low fertility equilibrium, however, the demographic gift for growth disappears. The benefits from this demographic bonus can be large and the sooner it can be captured the better. This requires an accelerated decline in fertility as well as sound economic and labor market policies to engender employment intensive growth. This will require a substantial expansion of the private sector.

### ***Gender Equitable Development is the Best Contraceptive***

13. **The GoE has so far emphasized economic development and increased female education as key policy levers to reduce fertility.** More recently, it has started to pay closer attention to supply-side issues, such as the strengthening of both access and quality of family planning services. To shed more light on the relative merits of broader development and more population-specific oriented interventions in accelerating the fertility transition, the study quantified the effects of a host of behavioral and socio-economic factors as well as family planning programs on fertility and mortality. Using the economy-wide Maquette for MDG Simulation (MAMS) model, which has been calibrated on Ethiopia, the report subsequently explored the fiscal, economic, and poverty effects of a high population growth/low family planning and a low population growth/high family planning scenario.

14. **In Ethiopia, early age at marriage and extremely low use of contraceptives are the key behavioral factors contributing to high fertility.** In analyzing the determinants of fertility, demographers have focused on the direct (*proximate*) determinants which are biological and behavioral in nature. These include exposure to the risk of conception as proxied by the percentage of women currently in union (married or living together), the use of contraceptives, level of abortions and pathological sterility, and postpartum infecundability (determined by postpartum abstinence and duration of breastfeeding). The relative effect of each of these variables on the total fertility rate (TFR) is captured in a model developed by John Bongaarts (1978), the methodological workhorse for demographers. When applied to Ethiopia, early age at marriage and first birth and extremely low use of contraceptives emerge as the key behavioral factors contributing to high fertility. Women who married before age 17 have on average one child more than those married at 17 or older. In line with these findings, the observed decline in TFR during the 1990s in Ethiopia closely corresponds to the observed delays in the age at marriage in both urban and rural areas as well as the observed increase in contraceptive use in urban areas. The decline has been largest in urban areas, and especially large in Addis Ababa, where the TFR even dropped to below-replacement levels around 2000.

15. **Education, culture, and residence are the key factors affecting age at marriage (and thus fertility).** Women with some primary education married about half a year later than those without any education, while women with post-primary education tended to postpone marriage by 2.5 years. Keeping all other factors constant, women in Amhara marry on average 1.5 years earlier than those in Tigray, who in turn marry 1.7 years earlier than those in SNNPR, where population density is also highest. Urban women between 15 and 29 years are 9 percentage points less likely to have been married than rural women. Coupled with current urbanization trends, the anticipated progress in educational achievements over the next 25 years predicts delayed and reduced marriage leading to an estimated reduction in fertility of one child per woman.

16. **Continuation of the observed annual increase in CPR between 2000 and 2005 of 1.32 percentage points combined with a decline in the proportion of married women from 63.5 to 53 percent following urbanization and educational expansion is estimated to reduce fertility from 5.9 in 2000 to 2.85 by 2030.** Historically, rapid expansion of contraceptive use

has been a challenge. Across the world, sustained annual increases in the CPR of 2 percentage points have been rarely observed for long periods. The average CPR increase among selected sub-Saharan African countries during the 1990s was 0.9 percentage points. The recently observed increase in contraceptive use in Ethiopia from 8.1 in 2000 to 14.7 in 2005 is thus encouraging and coincided with a rapid expansion of health facilities and family planning services. Nonetheless, unmet demand declined only marginally from 36 to 34 percent, suggesting continuing bottlenecks in the supply-chain. Econometric analysis also highlighted the important role of female education in the use of contraceptives, as well as a woman's likelihood of earning cash by participating in the labor force.

**17. Female education also has important fertility reducing effects among other women in the community and reduces from primary school onwards.** Economists have focused on indirect (*intermediate*) determinants and reduced form estimation techniques to gauge the relative importance of the different determinants of fertility. Indirect determinants of fertility include education, income, child mortality, cultural practice, and the status of women. Consistent with our findings from the proximate determinants analysis, female education is strongly associated with having fewer children. These effects are already visible at the primary education level, though they are stronger among women with post-primary education. This is an important and encouraging finding as the literature has so far suggested that only post-primary education reduces fertility. Moreover, female education also has positive externalities. Women living in communities with a large proportion of educated women have lower fertility, irrespective of their own level of education. Knowledge of family planning methods and the opportunity to earn cash income also reduce women's fertility. Substantial regional variations persist, with rural women having 0.4 more children on average than urban women.

**18. Assuming the development objectives and outcomes articulated in the Plan for Accelerated and Sustained Development to End Poverty (PASDEP) are achieved, the total fertility rate is simulated to drop by half from 5.9 in 2000 to 2.94 by 2030.** This holds under the following assumptions. By 2015 all girls will have completed primary school (i.e. Grade 4), which implies that by 2020 all 15-19 year old women will have at least some primary education. Half of all 15-19 year old women will have some secondary education by 2030. A sustained annual economic growth per adult equivalent between 2000 and 2030 of 1.5 percent (equivalent to the observed growth between 2000 and 2005) is hypothesized, as well as an increase in the urban population ratio from 14.9 in 2000 to 28 percent by 2030 (the UN Medium Variant urbanization projection). The TFR derived from our micro-econometric simulations using these assumptions is 2.94 children per woman in 2030. For comparison, the High, Medium, and Low Variant of the UN population projections predict a TFR in 2030 of 3.65, 3.15, and 2.65, respectively. This lends credibility to the simulations of the report, which are grounded in observed micro-behavior in the Ethiopian context and consistent with the ongoing GoE's development plans. The simulated results also help select the relevant UN projection scenario.

**19. Female education is the driving factor behind the simulated decline in fertility.** The envisioned progress in female adult education would reduce the TFR by more than two children from 5.9 in 2000 to 3.8 in 2030. This dramatic decline partly results from the strong external effects of female education on fertility. The decline in TFR associated with the simulated

increase in income per adult equivalent was about 1 child (from 5.9 in 2000 to 4.8 in 2030), while the effect of urbanization was limited.

20. **Similarly, expanding female education dramatically reduced child mortality**, both directly and through delayed marriage and older age at first birth. Based on the education intervention alone, under-five mortality was estimated to decline from 166 children per thousand live births in 2000 to 76 by 2030. While well above the Millennium Development Goal (MDG) of a 2/3 reduction by 2015, this is similar to the UN estimated decline in under-five mortality from 172 in 2000 to 73 by 2030. Adding the effects of increased access to water and sanitation services and expanding family planning services yields an accelerated decline in under-five mortality to 50 by 2030, a two-thirds reduction.

### *Contraceptives are also Good for Development*

21. **Studies from across Asia, Latin America, and sub-Saharan Africa estimate that lifetime exposure to family planning programs reduces lifetime fertility on average between 0.5 and 1.5 children per woman.** The estimates from Ethiopia undertaken for this study also point to substantial effects of family planning exposure on the number of children born, with a decrease in lifetime fertility at the higher end of the range found in the literature. The length of exposure to the program is also an important determinant of the program's effectiveness.

22. **In the absence of substantial access to family planning services, Ethiopia is expected to follow the UN High Variant population projection, i.e. TFR of 3.65 by 2030 or 0.7 additional children compared with a broader expansion of family planning services.** The projections derived from the reduced form analysis discussed above assume that the supply of family planning services and contraceptives parallels the rising demand. If this were not the case, it is assumed that TFR would be approximately 0.7 children per woman higher by 2030.<sup>3</sup>

23. **The welfare and poverty gains from accelerated fertility decline through accelerated family planning expansion and vigorous implementation of the population policy are substantial.** Two scenarios were considered. Under the high population growth/low family planning scenario, the TFR declines to 3.65, under-five mortality reaches 76, and the population expands to 135.3 million in 2030. Under the low population growth/high family planning scenario, the TFR will reach 2.94, under-five mortality drops till 50 by 2030, and the population is predicted to expand to 124.2 million, a difference of about 11.1 million people. The net present value of the per capita welfare gain (at a 5 percent discount rate) from sustained extra spending on family planning services is estimated at US\$112 per person, about equal to one year of income.<sup>4</sup> Through increased spending on family planning, households enjoy an accelerated

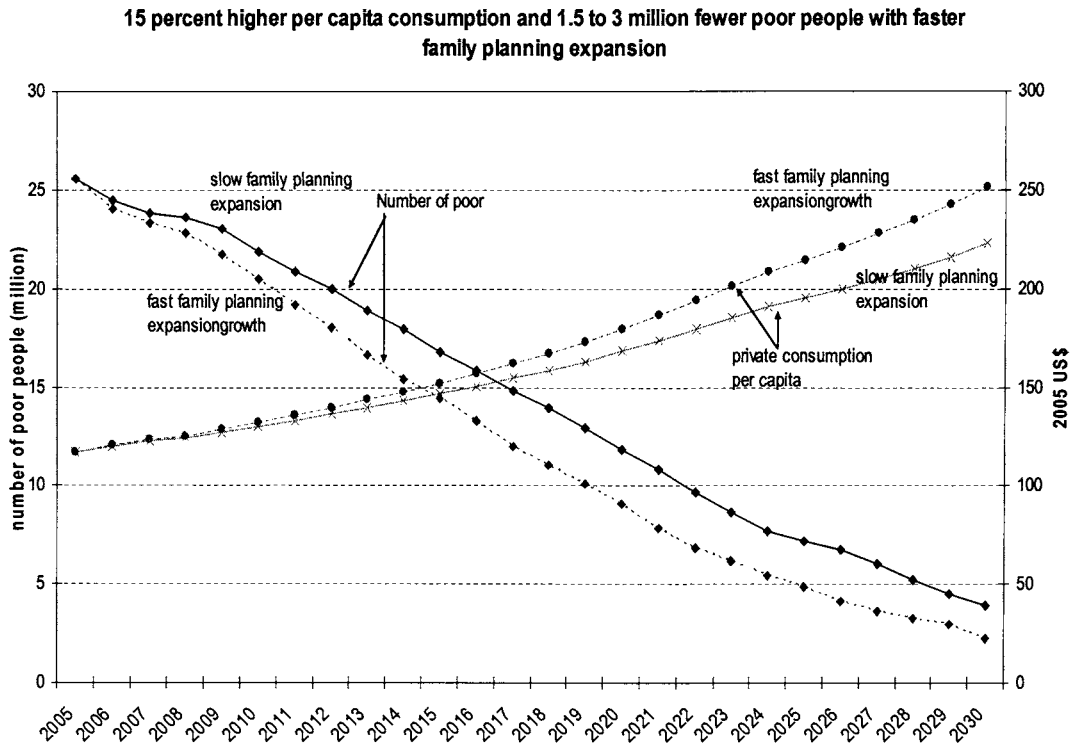
---

<sup>3</sup> Three considerations motivate this assumption. First, the effect of lifelong exposure to family planning activities is estimated to decrease total fertility by between 0.5 and 1.5 children per woman. Second, the difference in the TFR between increases in the CPR of 1.32 percentage points per year versus a slower rate of increase of a 0.9 percentage point per year is 0.64. Finally, an increase in the TFR by 0.7 would put Ethiopia on the UN population projection High Variant scenario.

<sup>4</sup> Two high population growth scenarios were considered differing only in the way increased public spending on social services was financed, i.e. through direct taxation or domestic borrowing. The former proved to be the least costly. The net present value (NPV) of the welfare difference is estimated at US\$105 to 112 per person.

annual growth in their real per capita consumption of at least 0.3 percentage points. This results in an 8 to 11 percent higher private consumption per capita in 2030. Therefore, between 1.5 and 3 million less people would be living in poverty from 2010 onwards. These benefits largely follow from reduced spending on education under the higher family planning expansion scenario (Figure A).

**Figure A: Under the Low Population Growth Scenario People are on Average Richer and Fewer People Live in Poverty**



Source: Authors' calculations.

24. **The Ethiopia National Population Policy (NPP) considers three broad entry points to redress the imbalance between demographic and economic growth:** 1) fostering gender equitable development, especially through female education, female empowerment, and overall income growth (including raising agricultural productivity and land conservation); 2) creating an enabling policy environment to address demographic issues; and 3) expanding the provision of family planning services. The focus has been largely on the first factor so far, i.e. fostering shared growth and enhancing gender equity by advancing female education. Progress toward the generation of a more enabling population policy environment has been mixed. The expansion of family planning services has more recently been embraced as key in accelerating the demographic transition. While good progress has been made over the past couple of years, the starting base is very low and concerted efforts will continue to be needed.

25. **Raising education levels for women has emerged as the key factor to accelerate the demographic transition in Ethiopia.** A lot of progress has been made over the past decade in

raising education levels more broadly and reducing the gender gap in particular. Nonetheless, substantial challenges do remain. Female adult education remains especially limited in rural areas. Bringing schools (especially primary schools) closer to students remains a critical step to increase girls' enrollment rates. To do so in a timely and affordable manner, school construction standards could be reviewed. On the demand-side, there is important scope for social protection programs, which help mitigate the negative impact of household income downturns on girls' school enrollment and completion. In particular, preliminary results with conditional cash programs in the Productive Safety Nets program have been promising and could be further explored. Given the strong association between parental (and especially female adult) education and the educational achievements of the community, the role of awareness and adult literacy campaigns deserves further attention.

**26. Enhanced female participation in the labor force and women's empowerment are also critical for demographic and economic development.** Indeed, the National Population Policy (NPP) calls for the empowerment of women and the PASDEP proposes concerted actions to address gender inequalities. Yet, with only one in five women earning cash income, the challenge is clearly huge. Traditional roles and household responsibilities continue to play a very important role in determining the likelihood of labor market participation. Provision of inexpensive child care has often proven to be an effective way to alleviate part of this barrier. Other interventions to foster women's participation in the labor force include the provision of incentives to businesses to hire women, the provision of business management training and follow-up support, and the extension of credit to female entrepreneurs. More broadly, implementation mechanisms to enforce legal reforms and women's rights could be strengthened.

**27. Concerted efforts will be necessary to effect the technological and institutional change needed to boost agricultural production more rapidly.** While the reader is referred to the Rural Development Review (World Bank, 2006a), the Land Degradation Study (World Bank, 2006b), and the Poverty Assessment (World Bank, 2005c) for more concrete policy suggestions, the thread running through these suggestions is the need for a paradigm shift from a top-down to a bottom-up approach in the design and implementation of rural development strategies to bring about the necessary technological and institutional change.

**28. A more enabling population policy environment should be promoted, including properly implemented institutional arrangements and sustainable Government financing.** Ethiopia has a good policy framework for its population activities—the population policy is sound, the legal framework is supportive of population-related activities, and the institutional architecture has been well thought through. Yet, it is also commonly accepted that the implementation of the National Population Policy (NPP) has been wanting, despite strong initial commitment at the highest levels of leadership. The recommended institutional arrangements at the national and regional levels were never implemented fully and a comprehensive implementation plan was never devised. In the absence of a National Population Council, coordination of the multi-sector players envisioned to implement the NPP has been difficult. Inadequate financing and volatility of donors' funding has further hampered the implementation of the NPP. Long-term sustainable financing of the National Office of Population (NOP) and the subsequent Population Department (PD) will remain a challenge unless domestic resources are

made available and NOP/PD funding is included in the Medium-Term Expenditure Framework (MTEF). Some regions such as SNNPR are moving in this direction.

29. **Furthermore, while monitoring and evaluation has improved over the past decade, substantial room for improvement remains.** Setting targets provides an important policy-making tool. Yet, targets are only useful if they are SMART, i.e. Specific, Monitorable, Achievable, Realistic, and Time-bound. The two major population-related targets included in the PASDEP (a reduction of the TFR from 5.4 in 2004/05 to 4.0 by 2009/10<sup>5</sup> and an increase in CPR from 15 percent in 2004/5 to 60 percent by 2009/10) are far too ambitious and how progress will be measured is not precisely defined. Substantial progress has been made toward collecting regular and reliable data on fertility and mortality through the Demographic and Health Surveys (DHS), though the information base on the supply of family planning services, the overall size and migration patterns of the population, and the number of births and deaths occurring in the population could be substantially improved through the implementation of Health Facility Surveys (HFS) and better collection of vital and services statistics. The information flow between analysts and policy-makers should also be strengthened.

30. **The main challenge, however, is to provide more and better family planning services.** Actions should focus on addressing issues of access, supply, and quality. Interventions could be pursued along three programmatic directions:

- ✓ *The coverage of family planning services should be expanded, especially in the more remote rural areas.* The closer family planning service centers are the more likely women will increase their use of contraceptives. The Ministry of Health is in the process of deploying 30,000 Health Extension Workers (HEWs) and 20,000 Community-Based Reproductive Health Agents (CBRHAs) throughout the country. They will be responsible for delivering primary health care services, including family planning and other reproductive health services at community and household levels. The prospect that the HEWs and especially the CBRHAs will improve the coverage and use of family planning services in the country is good (Box A). Nonetheless, introduction of a monitoring and evaluation program examining the effectiveness of these outreach activities is recommended to continuously learn and adapt the implementation modalities. In addition, the private sector and NGOs could be further engaged as partners in scaling up family planning activities, especially to help reach certain groups (e.g. the youth, the most remote, the rich), exploiting the advantages of market segmentation.
- ✓ *Improve the availability of contraceptives in existing distribution points.* This requires more sustainable financing of contraceptives as well as more effective distribution systems. Given the fluctuations in external financing, the Government could consider funding part of the cost of contraceptives to ensure a stable supply. Moreover, bottlenecks in the commodity supply-chain need to be removed. Emerging issues include the lack of transportation services at all levels of the distribution system and the need to reduce the number of steps in the supply-chain.

---

<sup>5</sup> The TFR base figure comes for the DHS 2005, using the 5-year prior to the survey reference period.

- ✓ *The quality of family planning services also needs to be improved.* To do so, the range of contraceptives should be expanded and the shortage of qualified health personnel addressed. To reduce human resource constraints in the health sector, rules governing the combination of jobs in the public and private sectors could be clarified, individual preferences in post assignments could be taken into account, performance-based management of health workers could be introduced, and HIV/AIDS infection as a professional risk could be more adequately addressed. In partnership with NGOs, reorientation of staff skills and attitudes in family planning service provision needs also to be addressed.

#### Box A: The Demand for Contraceptives is Rising

An increasing number of women travel long distances, in some cases walking as long as four days (return trip) every three months to receive a Norplant injection. Tsedeke says that “this progress represents a major behavioral change among community members.”

These women waited in line to receive long-term family planning services during a 7-day training session on Norplant injection and IUD insertion and removal. The training took place in the town of Nekemte in the West Oromiya Region and was organized by Pathfinder, the major partner Ethiopian Evangelical Church Mekane Yesus/Central Synod, and the Oromiya Development Association and the Oromiya Regional Health Bureau.



Source: Pathfinder International Ethiopia (2004).

31. **Overall, the prospects for rapid demographic change look promising in Ethiopia.** In the past decade, changes have taken place in the areas of female education, gender equitable development, women’s empowerment, income growth, as well as demand for - and acceptance of - modern contraceptives. The Government of Ethiopia has also come forward to address population issues in a more forceful way through institutional strengthening and the renewed priority given to population concerns in major strategic documents such as the PASDEP. However, there is still a need to provide more and better family planning services. In this respect, attitudes of Ethiopian people themselves have changed dramatically, including in rural areas. Although levels of unmet needs for family planning services remain high they could be satisfied more rapidly with the right mix of clear policy guidance, supply-chain strengthening, and health personnel deployment. Combined with private sector development and employment intensive growth, Ethiopia could then reap the benefits of its demographic bonus which would ultimately translate into an estimated 1.5 to 3 million Ethiopians less in poverty from 2010 onwards.



## INTRODUCTION

1. **The issue of rapid population growth is receiving renewed attention** (World Bank, 2007c). Over the past decade, sub-Saharan African (SSA) countries have engaged in major efforts to reduce poverty levels and reach the Millennium Development Goals (MDGs) by 2015. Reaching the MDGs will require a substantial expansion of social services. These services will need to expand at a faster rate when population growth is high and an ever increasing number of young people will need education and adequate health care. As a result, the demands on the Government's resources will increase rapidly while the increasing dependency ratios may reduce savings and investments in physical capital thereby imposing a drag on economic growth and development. Yet, sub-Saharan Africa remains sparsely populated compared with other continents and it has been argued that both population size and population density positively contribute to economic growth. Moreover, it is often argued, especially among economists, that it is not clear how to reduce population growth, even if it were desirable. In short, is a decrease in the rate of population growth really necessary to alleviate high levels of poverty and achieve the MDGs, and if so, how should this be achieved?

2. **Ever since Thomas Malthus issued his first "Essay on the Principle of Population" (1798), the relationship between population growth and development has been hotly debated.** The initial Malthusian proposition held that population growth would follow a geometric progression while food production would only increase arithmetically with hunger and disease keeping per capita income levels constant. These theoretical insights were inconsistent with historical evidence and Ester Boserup, a Danish economist, inverted the Malthusian proposition by making population growth the major factor for agricultural and technological development. She contended that agricultural intensification and food production were actually induced by an increase in population pressure (Boserup, 1965). Later she extended her hypothesis indicating that population pressure did not only induce technological, but also institutional change and the empowerment of women. However, the Boserupian alternative itself came under fire as her initial proposition did not seem to hold when populations grew fast. Most recently, a revisionist school has emerged, most elegantly articulated in a seminal book entitled "Population Matters" by Birdsall, Kelley, and Sinding (2001). In this view, the various demographic dimensions (population size, population density, population growth) affect economic growth differently depending on the country's stage in the demographic transition and the resulting changes in age structures.

3. **Irrespectively, consensus is growing that it is the *pace* of population growth which matters most, and much less its size.** Technological and institutional change may be too slow to avert the detrimental consequences associated with rapidly increasing population pressure such as land degradation, which may be irreversible, land fragmentation and potentially impoverishment. Population growth exceeding 2 percent per year is often considered a critical benchmark (World Bank, 1984) beyond which technology and institutions have hard time to keep up. In addition, rapid population growth changes the age structure of a population which in turn increases the demand on public resources especially in the education and health sectors as well as the savings potential of governments and individual households. This may lead to reduced investment both in human and physical capital jeopardizing current and future economic

growth. Yet, if a period of faster population growth is followed by a decline in population growth, usually induced through a decline in fertility, dependency ratios would come down, thereby reversing the negative effects of the age structure into a demographic bonus<sup>6</sup> of a larger share of working age people who could positively contribute to economic growth and poverty reduction. This assumes however that appropriate policies and programs are in place to capture this demographic bonus or dividend.

4. **In addition to these macro rationales, one must also factor in the aspirations of the people themselves.** Surveys in sub-Saharan African countries increasingly show large unmet demands for contraceptives, even in rural areas. This is consistent with the increasing levels of induced abortion in sub-Saharan Africa. Induced abortions in turn negatively affect maternal mortality rates, while lower fertility rates positively affect the survival rates and health of the children.

5. **All these considerations apply to Ethiopia, which has one of the largest and faster growing populations of sub-Saharan Africa.** Ethiopia does not only continue to score poorly in terms of its human development outcomes, despite substantial improvements in recent years, it also has a very youthful and rapidly expanding population, exacerbating the need for rapid expansion of quality social services. The peculiar features of its geographical landscape and the rural concentration of its people further complicate the logistics of service delivery.

6. **Until most recently, Ethiopia's record regarding agricultural production, food security, and environmental conservation has been mixed at best.** During the past decade, economic reforms, adoption of improved seeds and fertilizer, and agricultural intensification have enabled national food and grain production to keep pace with rapid population growth. However, the country has also suffered from severe drought, increasing population pressure, severe land degradation as well as severe recurrent famines. Moreover, the Ethiopian population is concentrated in the rural Highlands thereby exacerbating the demand on natural resources and land. Today, an estimated 5 to 7 million Ethiopians are annually in need of food aid.<sup>7</sup> Starvation has largely been prevented through a massive inflow of food aid every year. Inhabiting the Lowlands, which in essence constitute the new frontier, could be a great opportunity for the Ethiopian economy, especially for food production. Yet, cultivation of the Lowlands would also necessitate large investments to build the necessary infrastructure and eradicate disease (malaria, *trypanosomiasis*). Furthermore, it is not clear whether these areas could absorb the entire surplus of labor and whether geographical redistribution of the population could provide a sustainable solution. Lowland resettlement programs currently being implemented will accommodate a total of about two million people, a figure which in absolute terms corresponds to the Ethiopian population increase of just one year.

7. **This report addresses three overarching questions.** First, how do population growth and economic development interact in the Ethiopian context, and in particular, would Ethiopia stand to gain from a more rapid decline in fertility? Second, what is the role of public policy in addressing fertility behavior and in particular what is the relative role of broad development-

---

<sup>6</sup> For a discussion of the demographic bonus in sub-Saharan Africa, see Bloom et al. (2007).

<sup>7</sup> The number of people who are "chronically food insecure" is estimated at 8.3 million (World Bank, 2006c:42).

oriented policies and investments (education, infrastructure, agriculture, the environment, and gender equity) versus more population-specific policies and interventions including the provision of family planning services? Third, how could overall development and population-specific policies and investments be strengthened to more effectively accelerate the decline in fertility?

**8. The approach in this study is essentially empirical guided by insights from theory.** To examine how population growth and economic development interact, the study draws on key hypotheses from the economic and demographic literature and interprets and illustrates them within the Ethiopian context. Applying micro-econometric estimation techniques and macro-economic modeling devices to Ethiopia-specific data sets, it then estimates the relative contribution from both overall development and population-specific interventions in reducing fertility (and child mortality). Finally, the Delphi technique was applied to identify bottlenecks and assess progress in implementing ongoing population-specific interventions. These results, together with the insights from our empirical estimations and international experience, were synthesized in a series of suggested actions to more effectively affect fertility behavior in Ethiopia.

**9. Information base.** For constructing the basic demographic profile, the study draws heavily on the latest 1994 Census, which is by now somewhat outdated, as well as the Demographic and Health Surveys 2000 and 2005. Given that the focus of this study was on population and development dynamics, rather than on calibrating the exact size of the population, these data sources are adequate. The third Ethiopian Population and Housing Census was conducted in May 2007 (the Somali and Afar regions are to be enumerated later in 2007). The DHS surveys also form the basis for estimating the effect of different determinants of child mortality and fertility. A fertility survey conducted in 2004 with technical and financial assistance from Pathfinder (called the Pathfinder Survey 2004<sup>8</sup>) was augmented with a facility survey executed by the team to specifically analyze the effect of access to family planning on fertility within the Ethiopian context. An in-depth understanding of the specifics surrounding the implementation of the population policy and the provision of family planning surveys was obtained through numerous expert interviews and field visits.

**10. The first part of this study puts the population issue in Ethiopia in perspective.** Chapter 1 updates Ethiopia's demographic profile, looking in particular at the size of its population, its age structure, the speed at which it grows and its distribution across space. Chapter 2 explores the relationships between population growth, economic growth, and poverty within the Ethiopian context. Chapter 3 examines how Ethiopia has attempted to deal with its demographic challenges. In particular, it reviews the policies that have been developed, assesses their implementation, and analyzes how they relate to the new development paradigms, in particular, the poverty reduction strategies and the achievement of the MDGs. Chapter 4 concludes the review of population, poverty and policy-related issues in Ethiopia today.

**11. The second part of the study gauges the effect of the current development strategy on the prospects for population growth, economic growth, and poverty reduction in Ethiopia. It further explores the benefits from more concerted efforts to expand**

---

<sup>8</sup> Pathfinder International Ethiopia (2005a, 2005b); in this report, referred to as Pathfinder Survey 2004.

**population-specific interventions.** Chapters 5 and 6 empirically assess the relative importance of different determinants of mortality and fertility using micro-econometric techniques. Based on the empirical results of Chapters 5 and 6, Chapter 7 then explores how the envisioned interventions by the Government as articulated in the recent Plan for Accelerated and Sustained Development to End Poverty (PASDEP)<sup>9</sup> are likely to affect population growth, economic growth, and poverty reduction (Ministry of Finance and Economic Development, 2006b). The Spectrum population model (DemProj) of the Futures Group International and a dynamic macro-economic model called Maquette for MDG Simulation (MAMS) were used. A high fertility-high mortality and a low fertility-low mortality scenario are considered. They differ by the rate at which the provision of family planning services is expanded and by the emphasis placed on the creation of a more conducive population policy environment. These two scenarios broadly correspond to the High Variant and Medium Variant of the 2004 United Nations population projections. By comparing the difference in income growth per capita and the evolution of poverty across both scenarios, the net benefits from a more rapid expansion of population-specific interventions is gauged. Chapter 8 concludes.

12. **Finally, the third and last part of the report explores what actions could accelerate the demographic transition and help Ethiopia capture the demographic bonus faster.** Chapter 9 reviews which public interventions could help foster female education and empowerment. Chapter 10 outlines initiatives to create a more conducive policy environment to address population-related issues. Finally, Chapter 11 explores how family planning services could expand more rapidly and be made more effective. Chapter 12 concludes.

---

<sup>9</sup> In this report, subsequently referred to as the PASDEP.

## **PART I: POPULATION IN PERSPECTIVE – PEOPLE, POVERTY, AND POLICIES**

Part I reviews how population issues, poverty, and population policies relate to each other in the Ethiopian context and explores how they have evolved over the past decades. In doing so, the emphasis lies much more on exploring the dynamics of these relationships and their implications for the future, than on the exact magnitude of the statistics. As the latest available population census data go back to 1994 (a new Population and Housing Census was conducted in May 2007), one can only approximate the magnitude of some of the key dimensions of a demographic profile such as the population's current size, and its distribution across the country. Better information is available regarding fertility behavior and child mortality rates. Chapter 1 presents the current demographic profile. Chapter 2 discusses the implications of this profile in relation to Ethiopia's economic development. Chapter 3 assesses how the Government of Ethiopia (GoE) has responded so far to the population challenge. Chapter 4 synthesizes the key findings emerging from this picture.

## CHAPTER 1. THE DEMOGRAPHIC PROFILE

1.1 **Four key dimensions characterize a population: its size, its structure, the speed at which it changes, and its spatial (geographical) distribution.**<sup>10</sup> The *size* of a population is important to appreciate a country's potential political, military, and economic weight in relation to its neighbors as well as in the global community. Population density, i.e. the size of the population in relation to its total (or total arable) land, is an indicator of population pressure. When combined with a country's technological capabilities, it provides an indication of the pressure on the economic system, especially in agriculture-based economies. The population's age (and sex) *structure*, captured by the population pyramid and the dependency ratio, gauges the economic and social burdens placed on the economically active population. The *speed* at which a population grows is of critical importance as well, as it affects both the pressure on the overall economy's resources and the structure of the population. It sets the minimum pace at which the economy needs to grow and its institutions need to change to maintain the population's standard of living. Finally, how a population is distributed across *space*, including urbanization and internal migration trends, affects population pressure patterns, conglomeration effects, and development and investment choices.

1.2 In the following sections, we review how Ethiopia performs along each of these four dimensions both in absolute terms and in relation to its neighboring as well as other sub-Saharan African (SSA) countries. While Ethiopia's baseline data is comprehensive and of high quality in terms of fertility and mortality measures, it is somewhat outdated in other dimensions (e.g. age and sex structure and migrations). The third Population and Housing Census of 2007 should help fill this important information gap.<sup>11</sup>

### 1.1 Ethiopia is a Demographic Giant

1.3 **With a population estimated at 78 million in mid-2005 (World Bank projections; see Table 7.3), Ethiopia belongs to the 18 most populated countries in the world**<sup>12</sup> (Table 1.1 shows population data for 2005). Ethiopia also has the second largest population in sub-Saharan Africa (SSA) after Nigeria and it is expected to grow to 173 million people by 2050 (United Nations, 2005). Ethiopia will then become one of the 10 most populous countries in the world (Population Reference Bureau, 2004). At an estimated 2000 US\$110 income per capita (World Bank, 2006d), Ethiopia is also among the poorest countries in sub-Saharan Africa, and well below the SSA average.

1.4 **At 64 people per square kilometer, population density is high, even though with 1,104 million square kilometers Ethiopia has a large surface area.** This density is more than twice the population density of sub-Saharan Africa as a whole (Population Reference Bureau, 2005) (Table 1.1). It is even higher in the Highlands.

---

<sup>10</sup> This chapter is drawing from Ministry of Finance and Economic Development (2006a) and Worku (2006).

<sup>11</sup> The Census enumeration took place in May 2007 in all regions, except Somali and Afar where Census operations will be conducted later in the year.

<sup>12</sup> Together, these 18 countries hold 69 percent of the world's population; see Chasteland and Chesnais (2002).

**Table 1.1: Key Data for Ethiopia, Neighboring, and Other Big Countries in Sub-Saharan Africa**

	Population 2005 (million)	Surface area (Thousand sq. km.)	Population density (People per sq. km.)*	Gross Domestic Product per capita 2004 (2000\$)
<b>Ethiopia and neighboring countries:</b>				
Ethiopia	71	1,104	64	110
Sudan	36	2,506	14	530
Kenya	34	580	59	480
Somalia	8	638	13	-
Eritrea	4	118	34	190
<b>Other big countries in sub-Saharan Africa:</b>				
Nigeria	132	924	143	430
Congo, Dem. Rep.	58	2,345	25	110
<b>Sub-Saharan Africa</b>	<b>743</b>	<b>24,265</b>	<b>31</b>	<b>601</b>

*Source:* World Bank Development Indicators (World Bank, 2006d, 2007d).

*Note:* \* Population density is the total population divided by the surface area in square kilometers.

1.5 **From a demographic viewpoint, the three most important regions are: Oromiya, Amhara, and Southern Nations, Nationalities, and People's Region (SNNPR).** Together, these three regions harbor 86.2 percent of the total population of Ethiopia. They will be discussed in more detail in section 1.4 below.

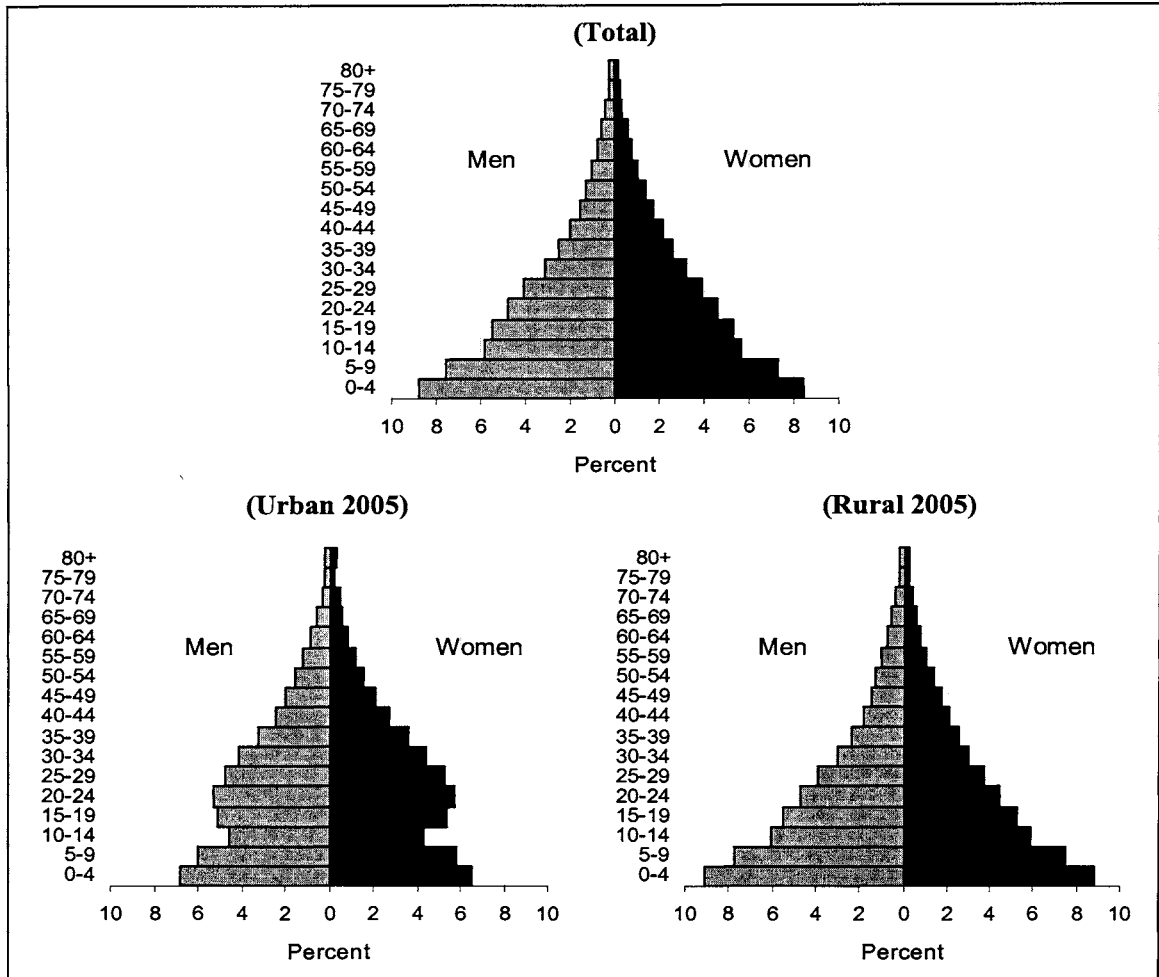
## 1.2 Young People Dominate the Population Resulting in a High Dependency Ratio

1.6 **The population pyramid for the entire country (Figure 1.1) has a very broad base, because a large part of the population belongs to young age groups (age group 0 to 14).** This age (and sex) structure is typical for a developing country. Nearly 44 percent of the total population is under 15, about 53 percent is between 15 and 64, and only about 3 percent is over 65 (National Office of Population, 2000). In addition, Ethiopia has a "youth bulge" meaning that the population between ages 15-29 represents more than 40 percent of the adult population (i.e. 15 and above) (Cincotta et al., 2003). In Ethiopia, the 15-29 age group represents almost half (49.8 percent) of the total population above age 15.

1.7 **In urban areas, the population pyramid has a smaller base because of lower urban fertility.** The relative greater importance of the age group 15-24, compared with the age group 10-14 may be explained both by the migration of young adults to urban areas as well as by the more rapid decline in urban fertility over the past decades. However, the pyramid shape of the urban areas has little impact on the population pyramid for the entire country because only about 15 percent<sup>13</sup> of the population lives in urban areas. In rural areas, populations have not yet experienced a major decline in fertility levels.

<sup>13</sup> The exact number is uncertain in the absence of a recent population census.

Figure 1.1: Population Pyramid, 2005



Source: World Bank Projections.

1.8 **There are slightly more men than women in Ethiopia (102 men per 100 women).** The sex ratio (the proportion of male population vs. female population) is higher in rural areas (102 men per 100 women) than in urban areas (97 men per 100 women) (Table 1.2). The dependency ratio is defined as the number of dependents in the population (i.e. those fewer than 15 and above 65 years) divided by the number of working age people (i.e. those aged between 15 and 64). This gives a useful approximation<sup>14</sup> of the economic dependency burden. The dependency ratio for Ethiopia is 84, which means that for every 100 persons who are of working age, there are 84 dependent people (81 of them are younger than 15 years and 3 are older than 65 years). Ethiopia's dependency ratio is comparable to the rest of sub-Saharan Africa, excluding South Africa. In urban areas, the total dependency ratio is lower (54) than in rural areas (87).

<sup>14</sup> Not everyone who is of working age works, and not everyone in the dependent ages is dependent.



**Table 1.2: Sex Ratios and Dependency Ratios in Ethiopia, 2005**

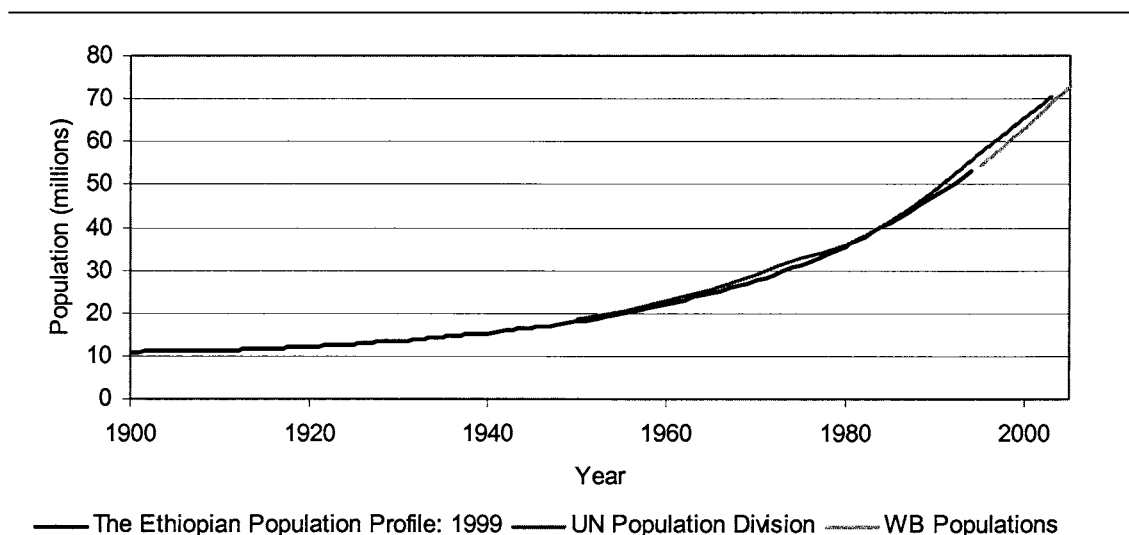
	Urban	Rural	Total
Sex ratio (men per 100 women)	97	102	102
Total dependency ratio	54	87	84
Youth dependency ratio	3	3	81
Old-age dependency ratio	57	90	3

Source: World Bank Projections.

### 1.3 The Population is rapidly Expanding

1.9 **Ethiopia's population has increased more than seven times over the past century.** The population of Ethiopia was approximately 10 million at the beginning of the 20<sup>th</sup> century (Figure 1.2). In mid-2005, the population was estimated at 78 million. The population increase can be mainly attributed to a decline in mortality (induced mainly by better health services, hygiene, and sanitation) in the face of continuing high fertility rates.

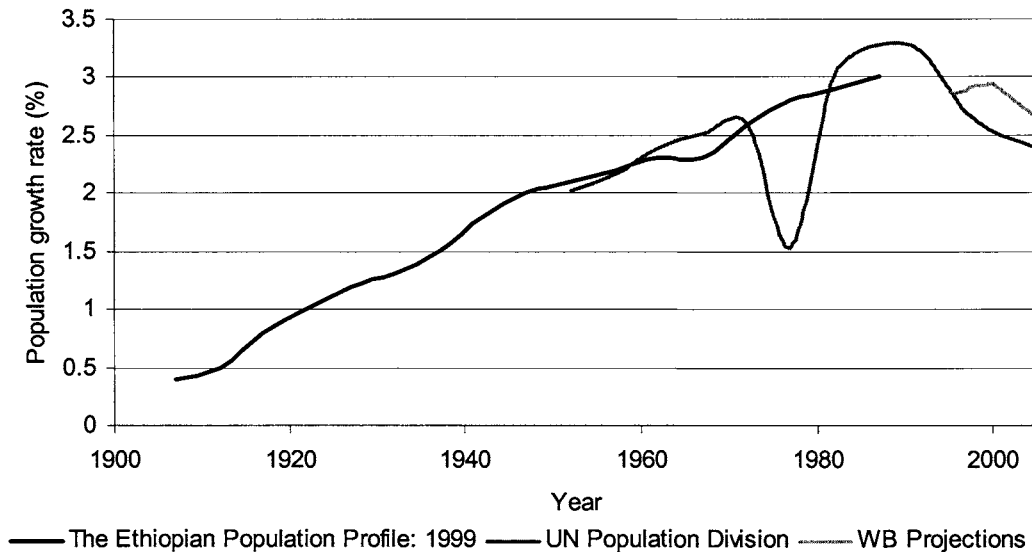
**Figure 1.2: Increase of Ethiopian Population, 1900-2005 (million)**



Sources: *Ethiopian Population Profile: 1999* (National Office of Population, 2000) and *World Population Prospects: The 2004 Revision, Medium Variant* (United Nations, 2005).

1.10 **Population growth accelerated in the 1950-1960s to peak at around 3 percent in 1990 and is currently around 2.5 percent per year, which is comparable to the average rate for sub-Saharan Africa.** In the first half of the 20<sup>th</sup> century, the annual population growth rate increased steadily but remained below 2 percent per year (Figure 1.3) (National Office of Population, 2000). From 1950 onwards, the population growth rate increased further to peak at around 3 percent in 1990. However, the rate has since declined to reach the current rate of about 2.5 percent per year. The sharp decrease in the population growth rate at the end of the 1970s (as highlighted in the United Nations Population Division data) was probably due to widespread social disruption and famine.

Figure 1.3: Annual Population Growth Rate, 1900-2005 (percent)



Sources: *Ethiopian Population Profile: 1999* (National Office of Population, 2000) and *World Population Prospects: The 2004 Revision, Medium Variant* (United Nations, 2005).

1.11 **Given the current rate of population growth in Ethiopia, it is estimated that almost two million people are added to the Ethiopian population every year and that the population will double in 30 years.** A common way to ascertain population growth is to calculate the time it will take for the population to double at a certain annual rate of growth. For example, at an annual growth rate of 2.3 percent the population will double in 30 years. If the population grows at 3 percent per year, the population will double in only 23 years. At the current estimated growth rate of 2.57 percent, the Ethiopian population is expected to double in 27 years.

1.12 **Population growth is determined by current and future crude<sup>15</sup> birth rates (CBR) as well as current and future crude death rates (CDR).** The difference between crude birth rates (number of births per 1,000 people) and crude death rates (number of deaths per 1,000 people) determines the rate of (natural) population increase. Population growth is further affected by net migration rates, i.e. the balance between in-migrants and out-migrants. In Ethiopia, population growth is likely mainly determined by mortality and fertility levels, given the rather small levels of net migration (though this is not very well documented—see section 1.4).

1.13 **Mortality levels started to decline in Ethiopia in 1950, but HIV, if unchecked, could slow overall improvements.** Levels of infant and child mortality are still high and the under-five mortality rate (number of children dying before their fifth birthday) was estimated at

<sup>15</sup> These rates are called “crude” because they are sensitive to the age structure.

166 per 1,000 live births in 2000 (DHS 2000<sup>16</sup>) and 123 per 1,000 live births in 2005 (DHS 2005<sup>17</sup>). Infant and child mortality outcomes could still be improved substantially in the nearby future through interventions aimed at improving education, nutrition, and public health. Adult mortality levels are also high, as evidenced by low life expectancies at birth. Progress in adult mortality may be harder in the future because of the possible impact of the HIV/AIDS epidemic. Major efforts are currently underway to stem the rise of the HIV/AIDS epidemic and there are signs that these efforts are starting to pay off. Overall, Ethiopian mortality indicators do not compare too favorably with other countries in sub-Saharan Africa, except perhaps with Somalia and the Democratic Republic of Congo (DRC).

**1.14 Fertility levels remain high in Ethiopia and above those of neighboring and other big sub-Saharan African countries** (Table 1.3). The total fertility rate (TFR)—the average number of children that women would have during their lifetime if they experienced current conditions of fertility—was estimated at 5.7 in 2005 (DHS 2005). It declined slightly from 6.4 in 1990 (Family and Fertility Survey 1990<sup>18</sup>) and 5.9 in 2000 (DHS 2000). Fertility is particularly low in Addis Ababa, where it has already reached below replacement levels due to behavioral change as reflected in the increased age at marriage, especially among females, and the greater use of modern contraceptives. Several factors have been cited to explain changes in urban fertility behavior including higher education, better provision of family planning services, and high housing costs inducing young couples to postpone marriage (Sibanda et al., 2003).

**Table 1.3: Mortality and Fertility Indicators for Ethiopia, Neighboring, and Other Big Countries in Sub-Saharan Africa, 2005**

	Life expectancy at birth (M/F) (years)	Infant mortality rate (per 1,000 live births)	Under-five mortality rate (per 1,000 live births)	Total fertility rate (births per woman)	Contraceptive prevalence rate, all methods (% of women ages 15-49)
Ethiopia and neighboring countries:					
Ethiopia	42/43	80	127	5.3	15
Sudan	55/58	62	90	4.1	7
Kenya	50/48	79	120	5.0	-
Somalia	47/49	133	225	6.2	15
Eritrea	53/57	50	78	5.2	8
Other big countries in sub-Saharan Africa:					
Nigeria	44/44	100	194	5.5	13
Congo, Dem. Rep.	43/45	129	205	6.7	31
Sub-Saharan Africa	46/47	96	163	5.3	23

Source: World Bank Development Indicators (World Bank, 2007d).

**1.15 Ethiopia is in the early phases of its fertility transition.** It has experienced a decline in mortality levels, which is the first stage of the demographic transition. This decline in mortality—even though infant, child, and adult mortality levels remain high—has triggered an acceleration of the population growth because it was not followed by an equal decline in fertility.

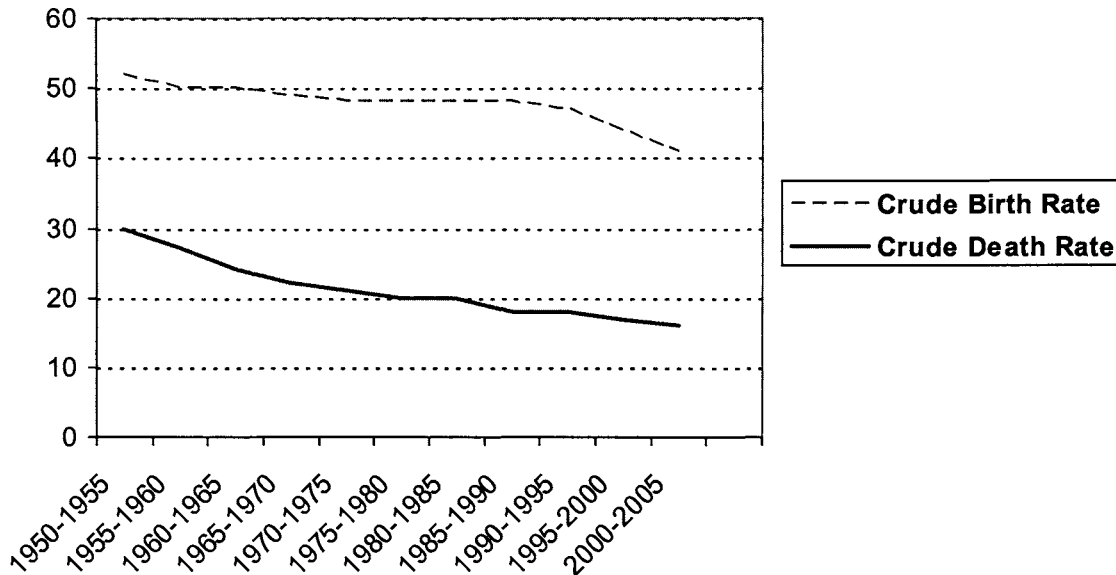
<sup>16</sup> Central Statistical Authority (2001); in this report, referred to as DHS 2000.

<sup>17</sup> Central Statistical Agency and ORC Macro (2006); in this report, referred to as DHS 2005.

<sup>18</sup> Central Statistical Authority (1993); in this report, referred to as Family and Fertility Survey 1990.

This first stage in the demographic transition is usually followed by a decline in fertility. This has now also started in Ethiopia (Figure 1.4) although fertility will need to decline substantially in order to reach a new balance with lower levels of mortality. The HIV/AIDS epidemic will also affect the survival of mothers and their children and might have an impact on fertility levels. Nevertheless, it seems at this stage that the demographic outcome of the epidemic will probably be less important than initially anticipated.

Figure 1.4: Crude Death Rate and Crude Birth Rate, 1950-2005 (per 1,000)



Source: United Nations (2005).

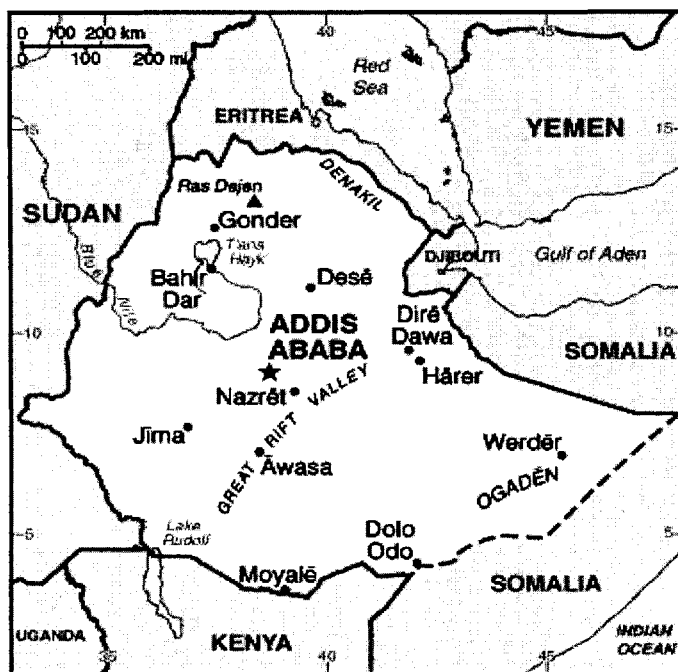
#### 1.4 People Live Concentrated in the Rural Highlands

1.16 **Ethiopia is a landlocked country located in East Africa with Highlands in the middle and Lowlands in its surroundings.** Ethiopia is surrounded by five countries: Eritrea, Sudan, Kenya, Somalia, and Djibouti (Figure 1.5). The Highlands are divided by the Great Rift Valley and this major geological divide is susceptible to earthquakes, volcanic eruptions, and frequent droughts. The Blue Nile, the chief headstream of the Nile in terms of water volume, starts in T'ana Hayk (Lake Tana) in northwest Ethiopia.

1.17 **The Ethiopian population is concentrated in the rural Highlands.** The size of farm holdings in Ethiopia is rapidly decreasing (from 0.5 ha per person in 1960 to 0.21 ha per person in 1999), available new land is in short supply, and the soil is quickly eroding. The Lowlands have lower population densities and could be used for resettlement, but they are not well supplied by infrastructure, are malaria infested, and suffer from the presence of the tsetse fly (leading to *trypanosomiasis*) making it difficult to undertake traditional ox-plow agriculture. There are also important cultural differences between the low- and highlanders, further impeding intraregional migration. Second, about 85 percent of the Ethiopian population lives in rural areas. Finally, 86.2 percent of the population lives in three regions, i.e. Amhara, Oromiya, and

SNNPR<sup>19</sup> (Table 1.4) (with Tigray, they encompass more than 90 percent of the total population).

Figure 1.5: Map of Ethiopia



Source: [www.wikipedia.org](http://www.wikipedia.org)

Table 1.4: Distribution of the Ethiopian Population among the Regions

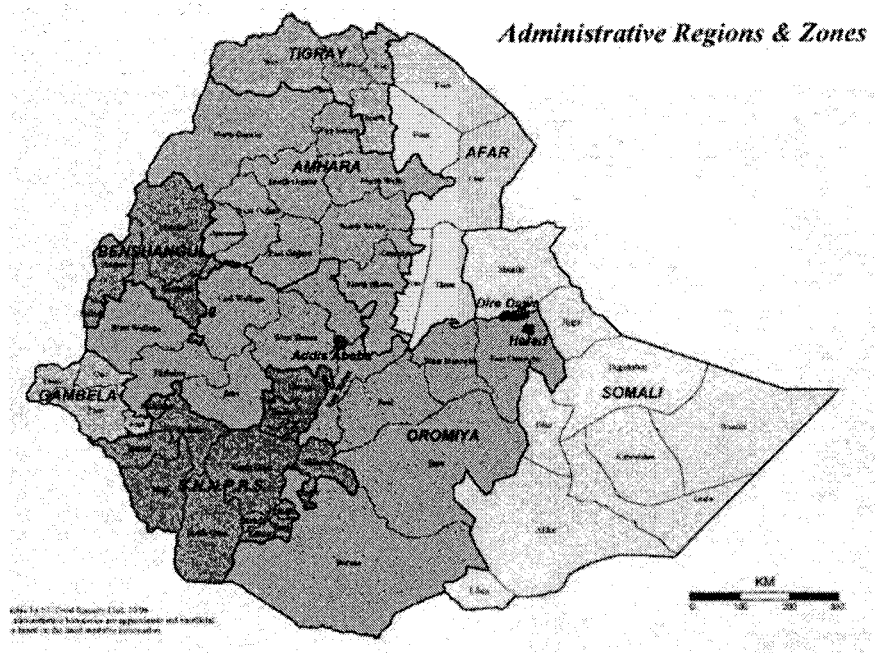
Region	Urban		Rural		Total	
	N	Percent	N	Percent	N	Percent
Tigray	453,414	0.8	2,809,203	5.2	3,262,617	6.0
Afar	69,098	0.1	201,255	0.4	270,353	0.5
Amhara	1,182,948	2.2	13,034,504	23.9	14,217,452	26.1
Oromiya	2,186,132	4.0	19,055,873	35.0	21,242,005	39.0
Somali	158,786	0.3	463,725	0.9	622,511	1.1
Benshangul/Gumaz	47,348	0.1	562,112	1.0	609,460	1.1
SNNPR	816,610	1.5	10,656,688	19.6	11,473,298	21.1
Gambella	39,278	0.1	141,509	0.3	180,787	0.3
Harari	73,284	0.1	66,141	0.1	139,425	0.3
Addis Ababa	2,161,996	4.0	24,833	0.0	2,186,646	4.0
Dire Dawa	162,658	0.3	86,025	0.2	284,683	0.5
Country-Total	7,351,552	13.5	47,101,686	86.5	54,453,238	100.0

Source: *The 1999 National Labour Force Survey* (Central Statistical Authority, 2000).

<sup>19</sup> For spelling of Ethiopian regions, see Turner, 2006.

1.18 Among the four major regions, population density is highest in SNNPR. In that region, population density was estimated in 1999 at 108 people per km<sup>2</sup>, but more importantly, the rural population per arable km<sup>2</sup> was estimated at 380. Population density per arable km<sup>2</sup> relates population size to arable area, measuring more accurately the carrying capacity of the land and thus the degree of population pressure on land resources. Oromiya<sup>20</sup>, on the other hand, was in 1999 the region with the largest population (over 21 million people), though population density was only 62 persons per km<sup>2</sup> and the rural population per arable km<sup>2</sup> was estimated at 267 people per km<sup>2</sup>. The capital, Addis Ababa, had the highest population density of the country with 4,572 people per km<sup>2</sup> whereas the Gambella, Afar, and Somali regions had the lowest population densities with 10 people or less per km<sup>2</sup> (Table 1.5 and Figure 1.6).

Figure 1.6: Map of the Regions of Ethiopia



Source: World Bank, Addis Ababa Office.

1.19 While internal migration appears limited, this is poorly documented and not well understood. Internal migrants can be either intraregional migrants or interregional migrants. In addition to its effect on population pressure, internal migration affects the age and sex structure of the population, as is clearly the case in Addis Ababa where migrants are more likely to be young adult males. The 1999 National Labour Force Survey provided some information on internal migration patterns. Tables 1.6 and 1.7 show for the four largest regions the level of migration (i.e. migration during the lifetime) as well as the level of recent migration (i.e. migration during the preceding five-year period). Both levels of migration point to a larger

<sup>20</sup> On Amhara and Oromiya regions, see Partnership in Improving Reproductive Health (2001).

portion of female migrants, which can be explained by marriage. Moreover, people living in urban areas are much more likely to migrate than people living in rural areas.

**Table 1.5: Population Density by Regions in Ethiopia**

Region	N (thousand)	Percent	Area (thousand km <sup>2</sup> )	Percentage of total area	Density (N/km <sup>2</sup> )
Tigray	3,593	5.8	50.1	4.5	72
Afar	1,188	1.9	-	-	10 <sup>a</sup>
Amhara	15,850	25.7	159.2	14.4	100
Oromiya	21,694	35.3	353.0	32.0	62
Somali	3,602	5.8	-	-	10 <sup>a</sup>
Benshangul/Gumuz	523	0.8	49.3	4.5	11
SNNPR	12,132	19.8	112.3	10.2	108
Gambella	206	0.3	25.8	2.3	8
Harari	154	0.2	0.3	0.0	495
Addis Ababa	2,424	3.9	0.5	0.5	4,572
Dire Dawa	306	0.5	1.2	0.1	252
Country total	61,672	100.0	1,104 <sup>b</sup>	-	56 <sup>c</sup>

a. Average density computed for the two regions taking the sums of their population and land area data.

b. Surface area according to World Bank World Development Indicators (2006d).

c. Density per km<sup>2</sup> using Surface Area from World Bank World Development Indicators (2006d).

Source: *Ethiopian Population Profile: 1999* (National Office of Population, 2000).

Note: Data are taken from different sources.

**Table 1.6: Migration by Regions and Sex, Recent and General**

Region	Level of migration (%)			Level of recent migration (%)		
	Total	Male	Female	Total	Male	Female
Amhara	16.9	14.4	19.3	3.9	3.4	4.3
Oromiya	19.1	16.5	21.6	4.2	4.0	4.5
SNNPR	16.0	13.5	18.4	3.4	3.3	3.4
Tigray	22.6	19.4	25.4	5.0	4.7	5.2
Country total	19.6	17.1	22.2	4.3	3.9	4.6

Source: Analytical report on the 1999 National Labour Force Survey (Central Statistical Authority, 2000).

**Table 1.7: Migration by Regions, Urban rural, Recent and General**

Region	Level of migration (%)			Level of recent migration (%)		
	Total	Urban	Rural	Total	Urban	Rural
Amhara	16.9	51.0	13.8	3.9	18.0	2.6
Oromiya	19.1	50.4	15.5	4.2	17.1	2.8
SNNPR	16.0	46.6	13.7	3.4	18.4	2.2
Tigray	22.6	50.3	18.1	5.0	18.6	2.8
Country total	19.6	49.3	15.0	4.3	14.8	2.6

Source: Analytical report on the 1999 National Labour Force Survey (Central Statistical Authority, 2000).

1.20 **According to the 1999 National Labour Force Survey, the net inflow of migrants into urban areas has been declining since 1984.** Almost 40 percent of internal migration is from rural to rural, often linked to marriage as mentioned. The second most important form of migration is from rural to urban areas. Urbanization takes place when Rural-Urban migration is larger than the Urban-Rural migration. During the 1999 Survey, there was still a difference between Rural-Urban and Urban-Rural, a difference of 7.8 percent, but this was less important

than during the previous surveys (Table 1.8). Thus, according to these estimates, urbanization still happens, but at a slower rate, a phenomenon that needs to be better understood.

1.21 **The rate of urbanization is important given the large difference in fertility behavior between rural and urban populations.** This is most vividly demonstrated by the fertility levels in Addis Ababa that are below replacement. Moreover, when people are scattered over large areas, it is more difficult to provide them with social services. On the other hand, a large influx of rural people into towns in the absence of urban employment opportunities leads to urban congestion and diseconomies of agglomeration.

**Table 1.8: Migration Patterns in 1984, 1994, and 1999 (percent)**

Forms of Migration	1984 Census	1994 Census	1999 Labour Force Survey
Rural-Rural	55.8	48.9	37.6
Rural-Urban	28.7	24.8	23.5
Urban-Rural	2.0	7.3	15.7
Urban-Urban	13.5	18.9	23.2
All forms	100.0	100.0	100.0
Net difference (Urban-Rural)	26.7	17.5	7.8

Source: Analytical report on the 1999 National Labour Force Survey (Central Statistical Authority, 2000).

1.22 **Very little is known about international migration.** Some Ethiopians leave their country to look for a better future. They are sometimes called “brain-drain” migrants. Other Ethiopians, given the political turmoil over the past decades, have left their country to seek asylum elsewhere. The United Nations Population Division (population projections of 2004) assumed the total number of Ethiopian emigrants to be 30,000 per year between 2000 and 2005. But this appears to be a conservative estimate and the actual number of emigrants could be twice as much. Irrespectively, these numbers are dwarfed by the estimated expansion of the Ethiopian population by two million a year. The effect of international emigration on Ethiopia’s population dynamics is small for all practical purposes.

1.23 **More numerous are the Internally Displaced Persons (IDPs) due to food shortages, war situations, and/or interethnic tensions.** Often, IDPs come from neighboring countries. IDPs are estimated between 151,000 and 167,000, though there are no official numbers (Table 1.9). In the Tigray region, there was a border war in 1998-2000 with 62,000 IDPs. The other IDPs are people who left their homes because of interethnic conflicts.

1.24 **Although population size, structure, and spatial distribution all have important implications on the overall economy, it is the *rate of population growth* that is most critical in exploring how demographic considerations do affect development and poverty reduction.** A country’s population growth rate determines what development strategy a country should adopt in order to minimize pressure on Government’s resources, meet expanding demand for social services, and alleviate land and environmental pressures. It is this link between population and economic growth that is explored in the following chapter.



**Table 1.9: Estimated Numbers of IDPs in Ethiopia per Regions**

Region	Estimated Numbers of IDPs
Tigray	62,091
Gambella	50,000
Oromiya	10,520 - 21,520
Somali	28,900 - 33,900
Total	151,511 - 167,511

*Source:* Focus on Ethiopia: Regional Overview (United Nations, n.d.) and Populations in the Horn of Africa Region (United Nations, 2004).

## CHAPTER 2. POPULATION AND POVERTY

2.1 **Our interest in Ethiopia's population dynamics is primarily motivated by the effect of demographic change on its people's well-being.** We focus in this study on the monetary dimensions of well-being, as captured by consumption/income per capita and monetary measures of poverty, recognizing that demographic change is likely to affect progress in the non-monetary dimensions of well-being as well.<sup>21</sup> The debate about whether rapid population growth actually impedes (Malthus, 1798) or fosters (Boserup, 1965) development has been longstanding and still continues today. Nonetheless, a "revisionist" consensus is emerging which emphasizes the need to consider separately the effects of different dimensions of demography (in particular, the rate of increase of the population and its age structure) on economic growth and poverty, and to distinguish between effects of rapid population growth on development in the short and the long term to allow sufficient time for potential feedback effects (Birdsall, Kelley, and Sinding, 2001).

2.2 **Changes in population growth affect the demographic profile in two fundamental directions, both affecting economic growth and poverty reduction.** First, a change in population growth transforms the age structure of the population, affecting particularly the dependency ratio. This in turn affects the savings and investment patterns of the population, both drivers of economic growth. Second, as populations expand the land-labor ratio likely declines. In the absence of technological and institutional change, this is detrimental for agricultural and overall economic growth especially in (closed and subsistence-oriented) agriculture-based economies such as Ethiopia. The capital-labor ratio is also likely to decline as faster population growth per se is unlikely to induce a higher savings rate to compensate for the decline in the capital-labor ratio.<sup>22</sup> Consequently, in the absence of a compensating increase in productivity through technological and institutional change, the declining resource base per person is likely to reduce output per capita.

2.3 **The effect of population growth on economic growth and poverty through its effects on the population's age structure and land pressure will further depend on where a country finds itself in the demographic transition.** The central message of this report is that high population growth, usually exogenously induced through a decline in child mortality rates, puts a burden on economic growth and poverty reduction in the early stages of the demographic transition through the generation of higher dependency ratios and lower savings, and increasing land pressure. However, this early phase of high population growth also generates favorable conditions for acceleration of the economic growth through an increase in the share of working age people. This occurs when a decline in mortality is eventually followed by a decline in

---

<sup>21</sup> Non-monetary indicators of well-being include, among others, the population's literacy rates, its nutritional and health status, and its status of empowerment. For a recent review of the status and evolution of non-monetary indicators since 1990, see World Bank (2005c). At the household level, a larger number of children are usually associated with lower human capital investment in each child, coined by Becker the quantity-quality trade-off. Klasen (2003) found for example that high fertility is one of the main reasons for high child mortality in sub-Saharan Africa (SSA).

<sup>22</sup> The decline in the land – labor ratio has been more emphasized in the agricultural economics and farming systems literature while the capital-shallowing (the decline in the capital - labor ratio) has been at the center of the economic literature on economic growth and population.

fertility, and thus a slower population growth. Economic growth is also bolstered by technological and institutional innovations following the changing production factor ratios and relative production factor prices. This thesis posits that a decline in population growth, when preceded by a rapid increase, is good for economic growth and poverty reduction. It provides hope for Ethiopia which has entered the second phase of its demographic transition; fertility peaked in the early 1990s and has started to decline thereafter (probably faster than mortality), slowing down population growth, albeit timidly so far.

**2.4 This chapter reviews in more depth the thesis that high population growth not only generates an initial drag on economic growth, but in doing so, also yields favorable conditions for accelerated growth thereafter.** First, it is illustrated how the evolving age structure affects saving and investment patterns and thus economic growth as the country moves through the phases of its demographic transition. From this analysis it will be argued that Ethiopia is poised to capture a (much needed) demographic bonus. However, this does not happen automatically. In the second section, it is reviewed how population growth is affecting the land-labor ratio in Ethiopia and its implications for further development. It is argued that Ethiopia finds itself at a crossroad between a Malthusian and a Boserupian evolution. While Malthusian type responses are emerging through voluntary reductions in fertility and famines, Boserupian responses emphasizing technological and institutional changes can also be observed in the current development policies such as the emphasis on the adoption of land-saving technologies and changes in land policy to enhance the security and transferability of land tenure rights.

## **2.1 The Burdens and Benefits of an Evolving Age Structure**

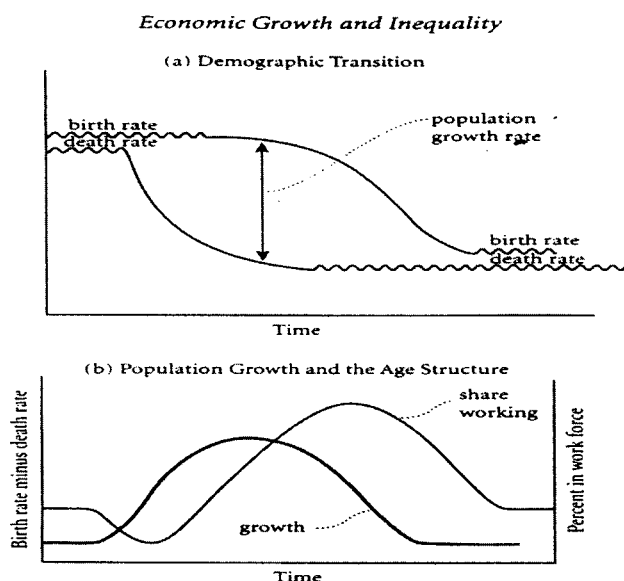
**2.5** A stylized presentation of both the demographic transition as well as the accompanying change in the share of working age people in the total population is presented in Figure 2.1. As discussed in Chapter 1, the demographic transition describes the evolution from a situation of high fertility/CBR and mortality/CDR associated with low population growth to a situation of low mortality and low fertility also associated with low population growth. Declines in mortality, especially infant and child mortality, instigate a rapid increase in the population growth rate, as fertility usually does not decline at first, resulting in a youth bulge which is large and persistent. This forms the first phase of the demographic transition. A decline in fertility usually follows, albeit with a lag, marking the second phase of the transition when the fertility decline is faster than the mortality decline (Chesnais, 1992).<sup>23</sup> The decline in mortality is usually exogenously induced through the adoption of improved health services and better immunization coverage, though the decline in fertility is mostly (but not only) endogenous. The latter observation raises fundamental questions about the possibilities for policies to help trigger the fertility decline. The population growth rate is implicitly represented in panel one of Figure 2.1

---

<sup>23</sup> For example, in Singapore, Korea, and Malaysia, fertility began to decline about fifteen years after the child mortality drop. In other countries, the delay was longer (e.g. about 25 years in Thailand). In sub-Saharan Africa, the mortality decline started before World War II while the fertility decline did not start in earnest before the 1980s and even the 1990s with the exception of a few front-runner countries such as South Africa, Zimbabwe, Botswana, and Kenya.

as the difference between fertility and mortality.<sup>24</sup> It is depicted explicitly in panel two together with the evolution of the share of the working population to the total population. The latter declines at first as the share of children in the population rapidly increases following the decline in (infant and child) mortality. It subsequently increases and declines again thereafter.

**Figure 2.1: The Demographic Transition and the Changing Age Structure**



Source: Bloom and Williamson (1998: Figure 1)

2.6 **High population growth reduces economic growth per capita at first but generates favorable conditions for accelerated growth thereafter, a phenomenon often referred to as the demographic bonus.** In the early stages of the demographic transition, per capita income growth is diminished by large youth-dependent burdens maintained by proportionally fewer working-age adults, resulting in relatively less workers and savers. Along with the growing young population comes an increasing demand for social services, in particular, education and health. Meeting this demand may come at the expense of public spending on physical capital (e.g. infrastructure). If financed through domestic borrowing, it could crowd out private investment through an increase in interest rates. As the demographic transition proceeds, per capita income growth is fostered by smaller youth-dependent burdens and a larger share of working age adults, producing relatively more workers and savers. The early burden of having few workers and savers becomes a potential gift in the form of a high share of working age adults, the “demographic bonus.” In addition, Government spending can be reduced and/or redirected to investment in physical capital thereby freeing up resources for private investment and redressing potential imbalances between the level and quality of human and physical capital.

<sup>24</sup> The figure abstracts from migration, which, as discussed in Chapter 1, is unlikely to substantially affect population dynamics in Ethiopia.

Later, however, this bonus evaporates, as the elderly share rises. Indeed, in a stable population, the growth rate of the workforce equals the growth rate of the population, and net demographic effects vanish. While this demographic bonus is temporary, it also indicates that the country potentially stands to gain from a decline in fertility (and thus slower population growth), after a period of accelerated population growth.

2.7 **The demographic bonus can be large.** It has been estimated that 1.4 to 1.9 percentage points of GDP per capita growth in East Asia during the period 1965-1990 or as much as one third of the East Asian miracle (1.9/6.11) can be explained through the rapid increase in the labor force and the associated increase in savings and accumulation.<sup>25</sup> Clearly, the demographic bonus can be substantial. In South East Asia, the fertility decline started later and infant mortality rates did not decline as dramatically. Population dynamics still accounted for 0.9 to 1.8 percentage points of per capita economic growth, or up to almost half their average per capita economic growth (1.8/3.8) over the same period. In South Asia, which has not advanced as much in the demographic transition, and which has grown slower over time, 0.4 to 1.3 percentage points, or up to three quarters of average economic per capita growth (1.3/1.7) between 1965 and 1990, can be attributed to demographic changes. Until the early 1990s, sub-Saharan Africa was still largely in the first phase of the demographic transition. Its population dynamics of increasing dependency ratios and depressed savings posed a burden on its growth process. Yet, as the fertility decline has started in about two thirds of sub-Saharan countries, it is now also poised to capture its demographic bonus.

2.8 **The demographic bonus is by no means automatic.** For the increasing share of the working age population to positively contribute to economic growth they must: 1) be productively employed and not reduce their hours of work; 2) save more and invest it wisely; and 3) be well educated by their governments to ensure a high return for their labor efforts. This implies that the positive effects of a declining dependency ratio are likely to depend strongly on the economic policy that accompanies this transition. Birdsall, Kelley, and Sinding (2001) argue that East Asia captured most of its demographic bonus due to a combination of good accompanying economic policies including fiscal discipline, relatively open and competitive markets, and substantial public investment in basic education yielding both a healthy return on human and physical capital and substantial participation in the labor force. Countries in Latin America, on the other hand, may have benefited less from the demographic bonus, perhaps because their fertility declines have been more protracted than in Asia and because they did not manage to productively employ their expanding young labor force.

2.9 **While the demographic bonus is transitional, there are substantial benefits from capturing it sooner rather than later.** Using a savings model applied to Taiwan with individual savings decisions governed by life-cycle considerations, Lee, Mason, and Miller (2001) found that a more rapid transition in Taiwan would have caused incomes to begin increasing at an earlier date, but that the rate of growth would not have been more rapid. In case of a slower transition, incomes would have grown slower. Clearly, any measure which helps

---

<sup>25</sup> Average GDP growth per capita in East Asia during the 1965-1990 period was estimated at 6.11 percentage points (Williamson, 2001). Krugman (1994) also argued that the East Asian miracle has been mainly driven by high rates of labor force growth and accumulation. On the Asian miracle, see also Bloom and Williamson (1998).

increase incomes earlier is desirable, especially when levels of development are as low as in Ethiopia. Chapter 7 simulates the welfare benefits from a faster fertility transition based on a dynamic economic growth model.

**2.10 In addition to reducing poverty through fostering economic growth, the decline in fertility and the accompanying change in the age structure may also reduce poverty through its dampening effects on inequality.** That economic growth fosters poverty reduction has by now been well established. Equally well known is that the lower overall income inequality is, the larger the effect of growth on poverty reduction will be.<sup>26</sup> The effect of a change in fertility may affect the income distribution through two channels.<sup>27</sup> First, econometric analysis suggests that higher dependency ratios are associated with lower consumption per capita (World Bank, 2005c). Higher national fertility would then increase inequality of consumption/income if the additional births were concentrated among the poor, raising dependency ratios among the poor disproportionately. Or vice versa, lower national fertility would reduce inequality if the decline in fertility would be concentrated among the poor. This is plausible given that the poor tend to have more children to begin with.<sup>28</sup> Eastwood and Lipton (2001) present weak empirical evidence that the ratio of dependents to non-dependents increases slightly faster among the poor when fertility increases. Second, fertility changes are also likely to affect the productive and savings capacity of the non-dependent members and an equal increase/decrease in the dependency ratio may affect these capacities differently among poorer and richer households. One channel through which higher fertility may be a disadvantage to poorer households is the differential costs of child care. If the cost were constant across households, then the poor would disproportionately lose more holding household income constant. If not, then it is possible that the cost of child care may differ depending on the wealth of the household.

**2.11 Finally, while the proposition of a demographic bonus provides hope, it hinges critically on the assumption that the exogenously induced decline in mortality is followed rapidly by a decline in fertility.** This raises the question of how the fertility decline will be triggered and whether there is scope for policies to accelerate this process. Quantifying the demographic bonus and exploring the appropriate policy package to do so, forms the objective of Part II of this report. In particular, it will address the debate about whether broad gender equitable development interventions will be sufficient to induce a reduction in population growth or whether there is a need for population-specific interventions. In other words, is development the best contraceptive and/or are contraceptives good for development?

---

<sup>26</sup> Ravallion (2001); Adams (2004).

<sup>27</sup> Eastwood and Lipton (2001).

<sup>28</sup> There are several reasons why poorer households may have more children. First, poorer households may not have wanted more children, though they may find themselves without access to affordable family planning services. The higher rates of unmet needs among poorer uneducated women in Uganda support such a hypothesis (Klasen, 2005). Second, to be certain of future support in the face of high mortality rates, parents may choose to have more children than strictly necessary and they may actually end up having more surviving children than they anticipated. Third, when living in larger households, parents can pass on part of the costs of raising children to other household members (e.g. older relatives).

## 2.2 Population Growth and Population Pressure: Malthus or Boserup?

2.12 **The Malthusian perspective holds that a sudden increase in population growth is likely to result in impoverishment, which in turn will induce a change in fertility behavior, and an upsurge in mortality until the natural equilibrium is restored**—growth in the population is kept in check by an exogenously determined rate of growth in food production. As a population grows and the possibilities for expanding the land frontier or migrating abroad diminish, the land-labor ratio is likely to decline and the marginal returns to labor decrease given fixed land endowment. Pending an increase in the food productivity growth rate or an increase in off-farm employment opportunities, this will reduce food production and income per capita, thereby impoverishing people. This in turn will induce voluntary reduction in fertility (e.g. through the delay in the age at marriage and thus the first birth) as well as an increase in mortality (e.g. through the occurrence of epidemics and/or famine) until population growth is back in line with the exogenously determined growth in food production. Food production thus establishes the limits to population growth.

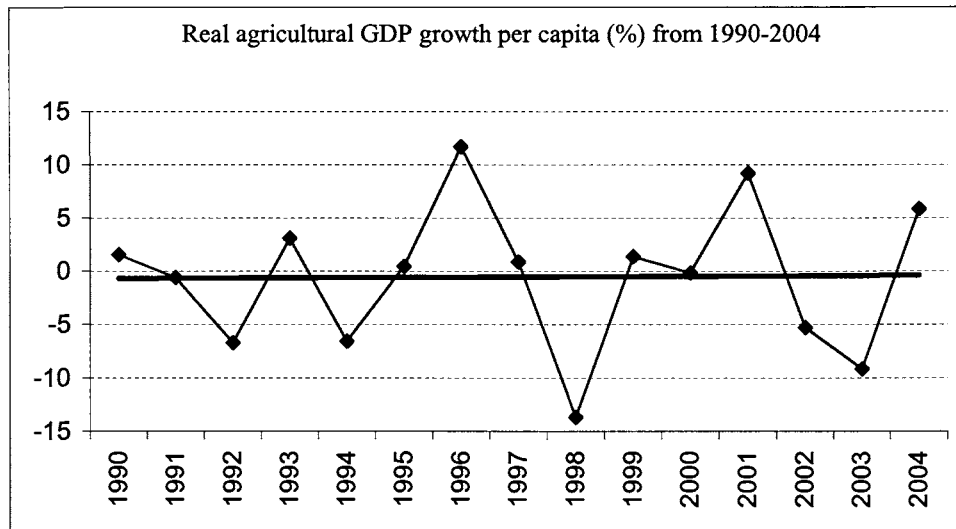
2.13 **A Malthusian reading of Ethiopia's most recent history of economic development is appealing.** Indeed, an exogenously induced decline in child mortality instigated an upsurge in population growth, which in turn led to a rapid decline in land holdings per household. Each farming household was estimated to have about one hectare of land in 1999 which translates to 0.21 hectares per rural person. This had declined from 0.5 hectares per person in the 1960s. At 0.11 hectares the available land per rural person is especially low in the SNNPR and Gambella regions. Land holdings per person are also smaller in the food insecure zones, consistent with common perceptions of much higher land scarcity in these areas (World Bank, 2005c). Moreover, a land-poor class is emerging with 20 percent of the rural population reported to have less than 0.06 ha per person or 0.08 when SNNPR is excluded.<sup>29</sup> With current cereal production techniques, 0.08 ha per person yields, on average, a daily equivalent of 779 calories per capita, just about half the person's daily cereal caloric needs (World Bank, 2005c). In sum, while the ongoing resettlement programs may suggest that the land frontier has not yet been reached, the land-labor ratio is clearly declining rapidly. This puts Ethiopia's farming system under great pressure. Modern agricultural technologies, including irrigation, remain low and agricultural GDP growth has barely kept up with population growth over the past 15 years (Figure 2.2), though a series of bumper crops have been reported more recently.<sup>30</sup>

---

<sup>29</sup> Holders in SNNPR have smaller plots and tend to allocate a substantial share of their land to coffee and enset (i.e. false banana) production.

<sup>30</sup> The extent of these bumper crops remains unclear as they went hand in hand with a substantial increase in food prices.

Figure 2.2: Agricultural Performance in Ethiopia, 1990-2004



Source: World Bank (2005c).

2.14 **Malthusian type responses both in terms of mortality and fertility appear at work, though food aid and international assistance have partly prevented the worst from happening.** The emergence of Malthusian type responses is expounded by the emergence of a (rapidly growing) core group of five to seven million people who need food assistance every year. This is further compounded by an ever more frequently recurring threat of drought-related famine, most recently in 2003, when an estimated 13-14 million lives were jeopardized by acute food (and water) shortages. Despite the clear presence of these Malthusian forces pushing to restore mortality rates to original levels through famine and epidemic, this has fortunately been averted through substantial international assistance in general, and a massive food aid response in particular. Huge amounts of food aid have been provided, both on an annual basis, as well as in times of drought-related crises as witnessed in 2003. Food aid imports have averaged about 715,000 Metric Tons (MT) a year between 1992 and 2003 and they are showing a strong upward trend since the mid-1990s. Moreover, food aid imports are equivalent to about 27 percent of the local cereal markets (World Bank, 2006a). There are also emerging signs of a voluntary reduction in fertility through a delay in age at marriage (and thus first birth) and strong demand for family planning services. While strict causality has not been established, the observation that age at marriage is *ceteris paribus* on average 3.2 years higher in SNNPR compared with Tigray is telling, especially given that population density per km<sup>2</sup> arable land in the former region is about twice as large as in the latter region.

2.15 **Do these observations imply that there is no scope for a Boserupian type response in Ethiopia?** Rather than assuming that technology and institutions are fixed over time as in Malthus' model, Ester Boserup (1910-1999) argued that increasing population pressure actually generates the necessary conditions to instigate technological and institutional changes which would help relieve the diminishing returns on labor arising from declining land-labor ratios (Boserup, 1965). While this thesis is derived from a broad and historical analysis of patterns of development, it drew further support from Hayami and Ruttan's (1985) seminal work



on the mechanisms underpinning technological and institutional changes. According to their induced innovation theory, changes in relative factor ratios induce changes in relative factor prices which in turn instigate the adoption of technologies which save in the scarce factor. Thus, as populations grow, land prices rise relative to wages, stimulating the adoption of land-saving methods (such as fertilizer). In addition, they argue that changes in the factor ratios and relative factor prices will also induce institutional changes such as the development of property rights and contractual arrangements that allow a more efficient allocation of resources.

**2.16 Boserupian type responses are happening, though they have not yet yielded the desired results on the ground.** The critical role assigned to fostering the adoption of land-saving technologies such as fertilizer and improved seeds, as well as the introduction of water management techniques in Ethiopia's PASDEP is fully consistent with the induced innovation theory. Nonetheless, despite concerted efforts by the GoE under the Participatory Demonstration and Training Extension System (PADETES) program to foster modern input use, farmers' adoption of modern inputs and technologies remains limited and well below the level necessary to substantially boost yields and agricultural output (World Bank, 2005c, 2006a).

**2.17 On the institutional front, the official land policy is also evolving** (World Bank, 2006a). In response to the continuous decline in the size of land holdings and thus the increasing need for land transactions to restore farms to a more optimal size,<sup>31</sup> renting land has been legalized. This in effect legitimizes the ongoing land transactions in the form of renting and share cropping. In addition, a massive resettlement program in the Lowlands has been undertaken to address land scarcity in an attempt to open the remaining land frontiers. Nonetheless, important restrictions on renting land remain and the GoE continues to adhere to state ownership of land, as enshrined in the 1994 Constitution (along with the promise to allocate land to all adults who wish to farm).<sup>32</sup> In addition, this broader policy stance on land, together with the occurrence of land redistributions in the 1990s, lack of clarity in the judicial rules to settle land disputes, and the remaining authority of different Government agencies to intervene in land-related matters has raised the level of uncertainty regarding land tenure security. This also impedes fixed investments (that yield only long-term benefits) such as perennial crops and trees

---

<sup>31</sup> What the size of a farm should be in order to reap the economies of scale has been a hotly debated topic in the agricultural economics literature. Clearly when capital (e.g. agricultural equipment such as tractors, ploughs, oxen, etc.) is important in the production process, farm sizes should be sufficiently large, at least to the extent that the lumpy indivisible nature of these investments cannot be overcome through institutional arrangements (e.g. production cooperatives or commercial provision of certain agricultural services [e.g. plowing] as is common in Western Europe). Yet, very little equipment is currently used in Ethiopian agriculture and most of the land-saving technologies (fertilizer, pesticides, and improved seeds) are labor intensive. As a result, while it is clear that land holdings may have become too small for certain households to be self-sufficient given current production technologies, this does not automatically imply that land holdings per se are not optimal, and that productivity could be increased merely by increasing land holdings to capture increasing returns to scale. That said the World Bank (2006a) does find that plot sizes (as opposed to the total size of the farm) are often in the increasing returns to scale range and that consolidation of plots could increase productivity. The reasons for the fragmentation of the landholdings in many plots are not clear. This could be partially driven by the desire to diversify crop production as a risk mitigation strategy, but it could also be the result of land fragmentation in response to population pressure more broadly.

<sup>32</sup> Land can be rented out only for a limited time (2 or 3 years if traditional technology is used, and up to 20 years, if modern technology is used). Access to land is also still conditional on residence in the *kebele*, and an individual cannot have rights to land in more than one *kebele* (World Bank, 2006a).

as well as soil conserving techniques such as terracing. Nonetheless, interventions to stop and restore soil fertility are urgently needed to halt the rapidly-expanding land degradation in Ethiopia which has been proven to pose a substantial drag on agricultural growth (World Bank, 2006b). Lack of land tenure security may also generate disincentives for labor mobility from agriculture to other sectors, thereby preventing an efficient allocation of labor across activities. The Government has recognized the importance of addressing the issue of land tenure security and is seeking to address this through the issuance of land holding documents or certificates of user rights. It is too early yet to assess the effectiveness of this approach.

**2.18** **Nonetheless, the speed at which the population has expanded and the potential irreversible nature of soil degradation call for more immediate institutional change and effective policy implementation.** While Boserupian responses are being attempted, they have not been sufficient to translate into a major productivity change. One reason for this must be found in the rapid onset of the population expansion in Ethiopia. While population growth has historically led to technological and institutional change, this happened over a much longer time period. Behavioral and institutional change is bound to take time and concerted policy actions will be necessary to speed up the process. This is especially important as soil fertility losses are often irreversible. It is further argued that while food aid has definitely contributed positively to people's well-being (Yamano, Alderman, and Christiaensen, 2005), especially among those in food insecure areas, the current modalities under which food aid is procured and distributed have also depressed cereal prices in the cereal producing surplus areas generating disincentives for net sellers to adopt modern technologies and boost cereal production (World Bank, 2006a).

**2.19** **In conclusion, while Ethiopia appears well placed to capture the benefits from its high population growth in the past, capturing these benefits will not happen automatically and will require concerted action on the Government's part.** The thesis that high population growth not only poses an initial drag on the economy and people's welfare, but also generates favorable conditions for accelerating growth thereafter, follows from an historical analysis of broad tendencies at the macro-level and remains in some sense, descriptive. In particular, it implicitly assumes that the decline in fertility and technological and institutional change will ensue automatically. This poses the question of whether there is a role for policy-making in this process. To address this question it is imperative to undertake a micro-analysis of fertility behavior and investigate, in particular, the role of both overall development policy and more population-specific interventions in couples' fertility choices. Similarly, the role of changing factor ratios and relative factor prices in the adoption of more productive agricultural technologies requires an in-depth understanding of farmers' behavior, which also requires micro-analysis. Finally, political economic analysis is required to better understand the processes driving institutional changes especially those related to property rights. This study will focus on the different behavioral and policy factors driving fertility choices in Part II. The debate about appropriate policies to foster technological and institutional changes and boost agricultural and economic growth is addressed in other recent World Bank reports including the Ethiopia Poverty Assessment (2005c), the Ethiopia Rural Development Review (2006a), the Ethiopia Poverty and Land Degradation study (2006b), and the World Bank Ethiopia Country Economic Memorandum (2007a).

## CHAPTER 3. POPULATION POLICIES IN PRACTICE

3.1 **Emerging from the long civil war and the severe famine of 1984-85, the Transitional Government of Ethiopia (TGE) that took control in 1991 introduced major policy changes and legal and institutional reforms** to shift the economy from a centralized to a decentralized free market economy. It also introduced several complementary socio-economic development policies around the same time. These included: the new economic policy, the national policy on Ethiopian women, the health policy, the social policy, the education and training policy, the development and social welfare policy, and the National Population Policy (NPP) which was adopted in 1993. In 1995, the TGE issued a new Constitution and established a decentralized federal system devolving authority to nine regional state governments, two administrative councils (in Addis Ababa and Dire Dawa), and 560 *woredas* (districts) with responsibility for planning, administration, and implementation of development programs.

3.2 **The rationale for the 1993 National Population Policy (NPP) was to address the imbalances between population growth and its natural resource base, given limited progress in productivity.** Economic growth had declined in the 1980s with the gross domestic product (GDP) growing at an average rate of 1.9 percent while the population grew at 3.1 percent annually, eroding per capita incomes (Transitional Government of Ethiopia, 1993). The Government was also concerned about high unemployment, uneven distribution of population, large numbers of displaced people and refugees, fragmentation and degradation of agricultural land, and the depletion of other natural resources including accelerating deforestation and soil erosion. The reality of a rapidly growing population in the face of limited agricultural innovation, stagnating food production, and a rapidly degrading natural resource base became starkly evident with chronic food insecurity regularly compounded by drought and the threat of famine.

3.3 **The disadvantaged position of women posed another concern.** While gender disparity reflects a broader societal phenomenon, many of the issues were also related to reproductive health, putting women at a particular disadvantage. The poor health status of women and high maternal mortality rates were associated with the high incidence of unplanned and unwanted births as well as early childbearing with an expected average number of children per woman (total fertility rate) of 6.4 in 1990.

3.4 **This chapter assesses the policies and programs that were put into place in Ethiopia to address the issue of rapid population growth.** It begins by reviewing the 1993 National Population Policy (NPP) (its framework, objectives, and strategies) and its purported institutional arrangements. This is followed by an assessment of the implementation of the NPP. Subsequently, the chapter briefly reviews the main tool of the policy, i.e. the Ethiopia family planning program. Finally, how these policies link with broader development strategies as articulated in the more recent Plan for Accelerated and Sustained Development to End Poverty (PASDEP) and the Millennium Development Goals (MDGs) is also discussed.

### 3.1 The 1993 National Population Policy

3.5 **The NPP articulated the Government's position on the relationship between demographic and economic growth, with sustainable and equitable human development as**

**its central theme.** The NPP was designed to provide a comprehensive and multi-sector framework for addressing population issues, as these were perceived not to be commensurate with achieving sustainable socio-economic development and poverty reduction. The policy stated that without a reduction in population growth, the efforts to reduce poverty and the achievement of national development goals would be jeopardized. National development goals include, but are not limited to, food security, universal primary education, wider access to health services and better health outcomes, improvement in housing conditions, and increased employment opportunities. In other words, the main goal of the NPP was to balance the rate of population growth with the country's capacity for sustainable development.

**3.6 The NPP aimed to achieve several broad objectives** including: (i) closing the gap between high population growth and low economic productivity through planned reduction of population growth and increasing economic returns; (ii) expediting economic and social development processes through holistic integrated development programs designed to achieve the structural transformation of the economy and employment; (iii) reducing the rate of rural to urban migration; (iv) maintaining/improving the carrying capacity of the environment by taking appropriate environmental protection/conservation measures; (v) raising the economic and social status of women by freeing them from the restrictions and drudgeries of traditional life and making it possible for them to participate productively in the larger community; and (vi) improving the social and economic status of vulnerable groups (i.e. women, youth, children, and the elderly).

**3.7 The NPP defined the following goals to be attained by the year 2015:** reducing total fertility from 7.7 to 4.0 children per woman by 2015;<sup>33</sup> increasing contraceptive use from 4.0 to 44.0 percent by 2015; reducing maternal, infant, and child mortality; improving the welfare of the population; increasing female participation in all levels of education; removing all legal and customary practices militating against economic and social rights of women, including the full enjoyment of property rights and access to gainful employment; ensuring spatially (geographically) balanced population distribution; maintaining environmental security; improving agriculture and introducing off-farm, non-agricultural employment; and mounting an effective country-wide population, information, and education (IEC) program promoting a smaller family and its relationship to human welfare and environmental security. As many of these goals are not time-bound, it is difficult to assess progress toward reaching them. More importantly, a monitoring and evaluation plan was not included in the NPP and was never developed.

**3.8 A series of multi-sector strategies and interventions was identified to achieve the goals** including: expanding information, education, and communication (IEC) as well as social mobilization; improving the quality of family planning services through community-based outreach and clinical approaches; enacting legal reforms to ensure women's participation and empowerment; fostering NGO and private sector participation; increasing national capacity for population research, data collection, and analysis; disseminating population information; and expanding training in population issues. An IEC program was developed to increase awareness

---

<sup>33</sup> Statistics as reported by the NPP. According to Gubhaju (1997), the TFR is estimated at 7.5 which is an upwardly revised estimate based on the 1984 Census (Central Statistical Authority, 1984).

of the benefits of a smaller family and its relationship to improved human welfare and the environment. The NPP also specified the institutional arrangements and organizational mechanisms to implement and coordinate the multi-sector aspects of the policy, including a National Population Council (NPC) chaired by the Prime Minister and an Office of Population within the Prime Minister's office. This will be discussed in the NPP Institutional Arrangements section of this chapter.

**3.9 Although the NPP was developed prior to the International Conference on Population and Development (ICPD) held in Cairo in 1994, it is considered complete and progressive.** It reflects many of the tenets and objectives of the ICPD Program of Action (POA). Both the ICPD and the NPP emphasized the links between population and development, with the underlying principle of focusing on individual welfare, promoting gender equity, and improving the quality of life rather than attaining demographic targets.

**3.10 Nevertheless, at first HIV/AIDS and reproductive health rights were not covered in the NPP.** The first cases of HIV/AIDS had been identified in 1984 and the epidemic has since spread rapidly in the 1990s reaching a prevalence rate estimated by UNAIDS at 4.4 percent in 2003. HIV prevalence was estimated at 3.9 percent of adults 15-49 in 2004 (Ministry of Health – Disease Prevention and Control Department, 2004). More recently, the Demographic and Health Survey 2005 has found a lower HIV prevalence, which is likely an underestimate because of the no response factor (Central Statistical Agency and ORC Macro, 2006). HIV/AIDS has contributed to slowing progress in many sectors and has become a major challenge facing the country. The prevalence rates are much higher in urban areas and lower in rural areas. Transmission is mainly through risky sexual behavior, with young people in urban areas being particularly vulnerable to infection. To curb the spread of the epidemic, the Federal Democratic Republic of Ethiopia (FDRE) issued a comprehensive multi-sector HIV/AIDS Policy in 1998. A strategic framework to facilitate its implementation was developed in 2001. To date, initial results in mitigating the HIV/AIDS epidemic appear to be encouraging.

**3.11 Reproductive health rights, a concept introduced at the ICPD, rest on the recognition of the basic rights of women to make choices** regarding the number, timing, and spacing of children, free from coercion, discrimination, and violence, as well as the right to access information and services to attain a high standard of sexual and reproductive health. Furthermore, the NPP does not include the broad reproductive health-integrated approach to address reproductive tract infections and HIV/AIDS. In addition, the NPP does not emphasize the importance of male participation which is critical in decision-making on fertility choices and utilizing health services.

**3.12 The Government has recently developed and launched a National Reproductive Health Strategy for the period 2006-2015** (Ministry of Health, 2006a), to incorporate the reproductive health concept with reproductive health as one of the three core sub-programs with emphasis on family planning (National Office of Population, 2003). Male participation, an important dimension, was also incorporated in the IEC component. The Ministry of Health incorporated a reproductive health program in its health sector development program (Ministry of Health, 1996). HIV/AIDS has also been addressed as a broad development issue. However, the implementation of integrated family planning and HIV/AIDS services remains a challenge as the two programs tend to operate vertically.

3.13 **Population issues have also been reflected in Ethiopia's poverty reduction strategies**, namely the Sustainable Development and Poverty Reduction Program (SDPRP)<sup>34</sup> in 2002 and the Plan for Accelerated and Sustained Development to End Poverty (PASDEP). The SDPRP's main objectives were consistent with the NPP multi-sector objectives to accelerate economic growth, enhance food security, and extricate the country from dependence on food aid. The SDPRP indicates also a focus on reducing the high fertility rate that is strongly influenced by the low education status of women, gender inequalities, and high infant and child mortality levels. To address population growth, the SDPRP emphasizes increasing female education and increasing access to maternal and child health care. These goals were sharpened in the PASDEP which specifically addresses the issue of high fertility levels and proposes concerted action to address gender inequalities. However, the two major population-related targets included in the PASDEP (a reduction of the TFR from 5.4 in 2004/05 to 4.0 by 2009/10<sup>35</sup> and an increase in the contraceptive prevalence rate from 15 percent in 2004/5 to 60 percent by 2009/10) are far too ambitious and how progress will be measured is not precisely defined.

3.14 **In 2000, the Government signed the 2000 Millennium Declaration committing to accelerate progress to achieve the Millennium Development Goals (MDGs) and specified targets for 2015, many of which overlap with the 2015 NPP targets.** The MDGs reflect different dimensions of the fight against poverty. Ethiopia is still below the sub-Saharan African average on several of the MDGs but has been making dramatic progress in recent years. For example, the primary education completion rate for Ethiopia (both sexes) was 22 percent for the period 1989/89 to 1993/94, but increased to 39 percent around 2002, and then to 55 percent in 2005 (as compared with 58 percent in 2005 for sub-Saharan Africa) (World Bank, 2005d, 2007d). Moreover, there is growing political commitment to accelerate progress toward reaching the MDGs and a multi-sector program is emerging. Policy reforms have been introduced to accelerate economic growth, improve infrastructure, agricultural productivity and private sector development, and build capacity. Achieving the MDGs will require large increases in both domestic and external resources.

## 3.2 Institutional Arrangements

3.15 **Recognizing that population issues cut across multiple economic and social sectors and given the difficulties of coordinating interagency concerted actions through one ministry, the NPP recommended establishing a National Population Council (NPC) as well as a National Office of Population (NOP), the latter to be located within the Prime Minister's office.** The NPC was to be chaired by the Prime Minister (or a senior official designated by the PM) and the NOP was created to ensure proper coordination. The NPC envisioned the inclusion of representatives from Line Ministries such as planning and economic development, agriculture, health, education, information, labor, and social affairs as well as the natural resources and environmental authorities to implement the various aspects of the NPP. Other non-ministerial institutions and offices to be included in the NPC were the Addis Ababa University, the Central Statistical Authority (CSA) which became the Central Statistical Agency

---

<sup>34</sup> Ministry of Finance and Economic Development (2002).

<sup>35</sup> The TFR base figure comes for the DHS 2005, using the 5-year prior to the survey reference period.

(CSAg), the Women's Affairs, and the Family Guidance Association of Ethiopia (FGAE). In addition, two prominent Ethiopian experts in the area of population were also to participate.

3.16 **The functions of the NPC were clearly defined to include:** developing specific policies and programs in different sectors and forging coordination across sectors; defining a broad legal framework and appropriate information, education, and communication (IEC) to educate the public; and monitoring and evaluating the implementation of the NPP. The NPC was to report to the Council of Ministers.

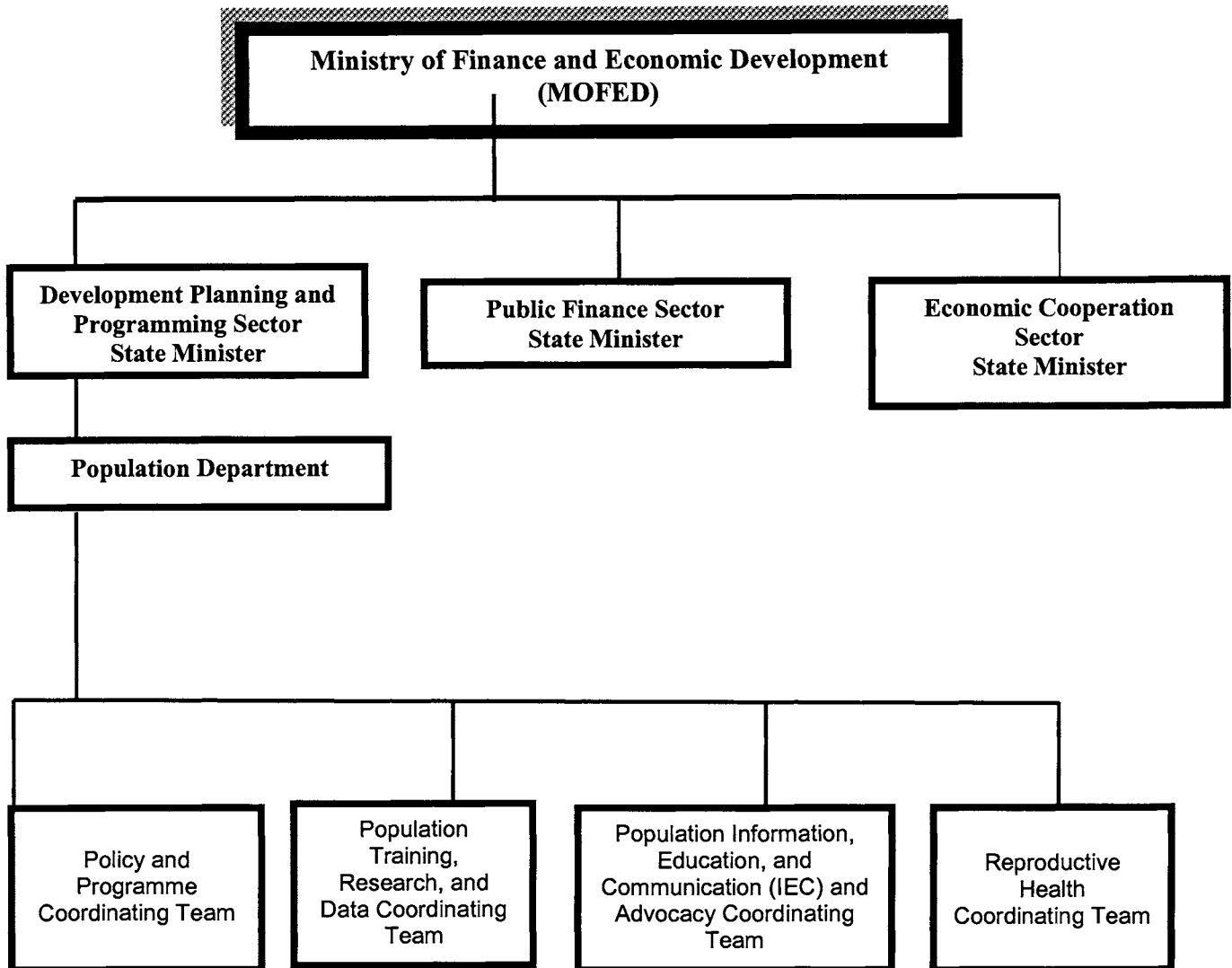
3.17 **On the other hand, the National Office of Population (NOP) was mandated to serve as the Secretariat of the NPC** coordinating inter-sectoral activities, monitoring and evaluating progress toward established goals, conducting advocacy, exchanging information, facilitating implementation, building local capacity to provide contraceptives and equipment, establishing a vital registration system, maintaining partnerships with international development agencies, and supporting capacity-building and training. One major task was articulating operational programs of population-related activities and ensuring that the programs conducted by various ministries and agencies comply with National Population Policy (NPP) and Council guidelines. The structure at the national level was to be replicated at the regional level and accordingly Regional Population Councils (RPCs) and Regional Offices of Population (ROPs) would be established comprising similar memberships as at the national level. Annual consultations with regions and grassroots structures were envisioned to facilitate the implementation of the NPP.

3.18 **The NOP became the Population Department (PD) in 2006 and the current organizational structure of the PD is shown in Figure 3.1. It reflects the priorities of the NPP,** namely: policy and program coordination; population training, research, and data coordination; population information, education, and communication (IEC); and reproductive health. It should be noted that the PD reports to the Ministry of Finance and Economic Development (MOFED), through the State Minister for Development Planning and Programming. This arrangement was made to facilitate the integration of population issues into development strategies, plans, and programs.

3.19 **The NPP emphasized the need for a clearly defined division of labor** across the different bodies at the national, regional, and *woreda* levels. However, a closer look at the organizational structure shows a potential overlap, in particular between the Reproductive Health Coordinating Team unit in the PD and Ministry of Health (MOH). Nevertheless, it is understood that the NOP/PD focuses chiefly on coordination whilst the MOH is mainly responsible for the provision of reproductive health and family planning services including IEC.

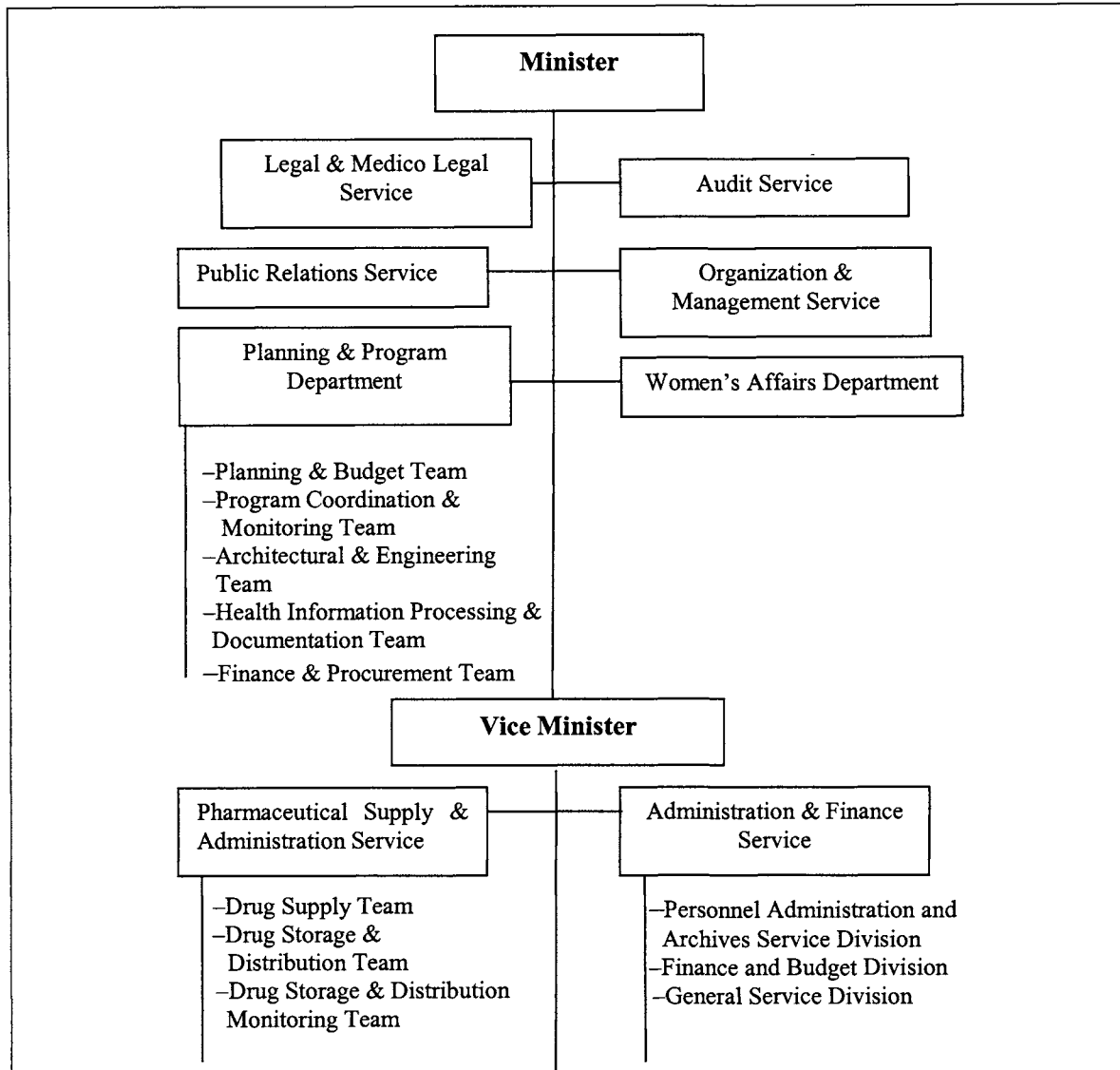
3.20 **The Ministry of Health (MOH) has a key role in executing the family planning program.** The organizational structure of the MOH (Figure 3.2) includes a Family Health Department responsible for mother and child health, family planning, and reproductive health.

Figure 3.1: Organizational Structure of the Population Department at MOFED

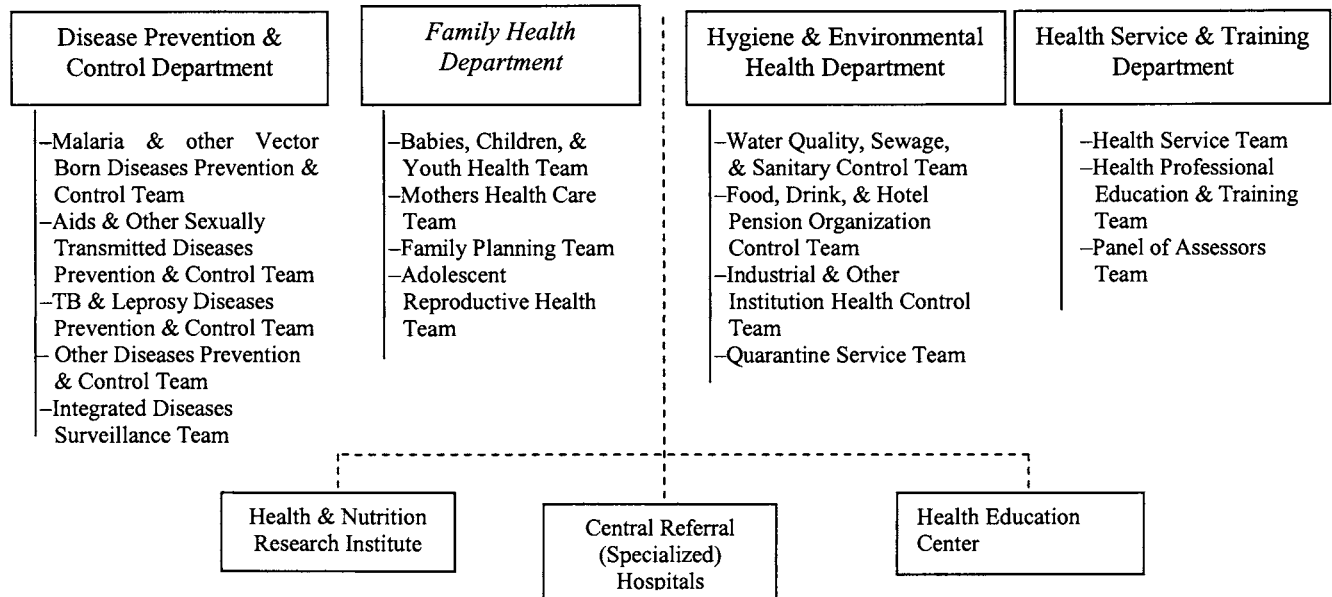




**Figure 3.2: Organizational Structure of the Ministry of Health**



**Figure 3.2: Organizational Structure of the Ministry of Health (continued)**



### 3.3 NPP Implementation Record

3.21 **A ten-year review of the National Population Policy (NPP) concluded that progress has been mixed and rather modest.** A national symposium and conference on population and development reviewed the achievements, implementation problems, and the continuing challenges. It was agreed that broad-based policy reforms (e.g. in education) initiated within the last decade had produced important gains in Ethiopia. However, while the NPP was judged fairly complete and not requiring major revisions, the progress made in its overall implementation was deemed rather modest (Table 3.1).

3.22 **These modest results may be linked to the lack of clear, specific objectives.** Although some goals are self-explanatory, i.e. to achieve a country-wide IEC campaign, quantitative targets are mentioned in only two areas, namely for the reduction of the total fertility rate (TFR) and the increase in the contraceptive prevalence rate (CPR), and both look overly ambitious. Other targets are not very specific; e.g. remove all constraints affecting females or increase agricultural productivity and off-farm activities. Moreover, half of the demographic-specific goals were not assigned any precise target. Finally, population institutions, such as the National Population Council (NPC), that were meant to spearhead and coordinate the overall effort in the population and reproductive health area did not play the role that was expected from them.

**Table 3.1: Synopsis of the National Population Policy of Ethiopia**

<b>Demographic Component/ Area</b>	<b>Proposed Overall Intervention</b>	<b>Specific Objectives</b>	<b>Achievements</b>
Population Growth	Reduce	None stated	Moderately successful
Infant and Child Mortality	Reduce	None stated	Moderately successful
Adult Mortality	Reduce	None stated	Moderately successful
Maternal Mortality	Reduce	None stated	Moderately successful
Total Fertility Rate (TFR)	Decrease	From 7.7 to 4.0 by 2015	5.4 in 2005
Family Planning & Smaller Family Information, Education, and Communication (IEC)	Expand	Achieve a country-wide IEC campaign	Successful, with shortcomings in remote rural areas
Contraceptive Prevalence Rate	Increase	From 4.0% to 44.0% by 2015	One third of target reached by 2005
Legal & Regulatory Framework	Reform existing legal and customary practices	Remove all constraints affecting females	Moderately successful
Internal Migration Patterns	Regulate	Reduce rate of rural to urban migration	Moderately successful
International Migration Trends	–	–	–
Socio-economic Development	Improve	Increase agriculture productivity and off-farm activities	Moderately successful
Environmental Conservation	Maintain	Maintaining/improving carrying capacity of the environment	Unsuccessful
Female Participation in Education	Increase	None stated	Moderately successful

*Source:* Transitional Government of Ethiopia (1993), pp. 27-29.

### **3.4 Delivery of Family Planning Services**

**3.23 Family planning programs improve public and individual welfare and reduce infant and maternal mortality.** Birth spacing of at least two years reduces infant mortality as well as the risk of maternal mortality, reduces unwanted pregnancies that often result in unsafe abortions, promotes responsible parenting, and reduces the financial and social burdens on

women as well as increases their productive and economic capacities. Family planning also extends potential benefits to the poorest of the citizenry where fertility and mortality rates are the highest.

**3.24 Recognizing the importance of family planning, the Government of Ethiopia approved in 1966 the formation of the Family Guidance Association of Ethiopia (FGAE), a national NGO which is an affiliate of the International Planned Parenthood Federation (IPPF), an international NGO based in London. Its program aimed to provide family planning information, counseling, and services to families that voluntarily expressed their need to space or limit their births (Central Statistical Authority, 2001) and to promote access and acceptability of family planning methods and incentives. This led to the opening of the first family planning clinic in Addis Ababa in 1975.**

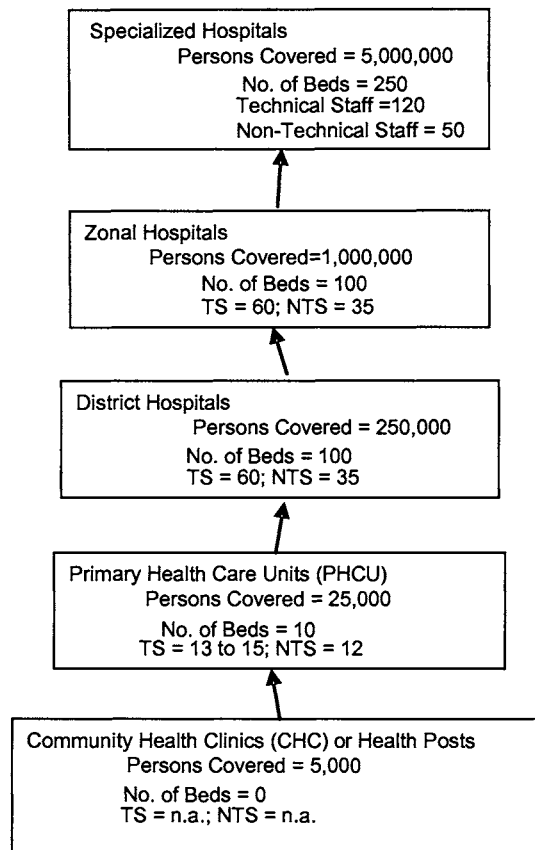
**3.25 Provision of family planning services through public institutions began in the early 1980s (Ahmed and Mengistu, 2002). This was done by integration of the Maternal and Child Health Program into the MOH. The strategy aimed to expand the accessibility of family planning services by utilizing the existing infrastructure of national health facilities. Most of the hospitals and health centers took part in this integration by virtue of having Maternal and Child Health (MCH) facilities. Currently, nearly all Government health facilities provide family planning (FP) services (National Office of Population, 2000).**

**3.26 The public sector, which operates through the primary health care system,<sup>36</sup> is the largest provider of family planning services in Ethiopia, providing 79.5 percent of family planning methods (DHS 2005). According to the Ministry of Health, Ethiopia has 110 hospitals, 382 health centers, 2,393 health stations and 1,023 health posts (the structure of the public health delivery system is provided in Figure 3.3; see also World Bank, 2004). In addition, 84 percent of the hospitals are public while 7 percent and 8 percent are NGO's and private, respectively (Ahmed and Mengistu, 2002). Most of the health facilities, both private and public, are located in urban areas, and this greatly impedes access of FP services to the poor, who reside mostly in rural areas. Overall, 51 percent of Ethiopians have access to clinical services (Ministry of Health – Planning and Programming Department, 1992, 1997). However, it is estimated that 75 percent of urban dwellers and only 42 percent of rural households have access to a health facility (World Bank, 2005c). For example, Addis Ababa, the most urbanized of the regions, has 22 hospitals, 17 of which are privately owned. In contrast, Afar, the second poorest area in the country has just two hospitals, both owned by the MOH (World Bank, 2004).**

---

<sup>36</sup> See also Essential Services for Health in Ethiopia (2005) and Ministry of Health (1998).

**Figure 3.3: Structure of the Public Health Delivery System**



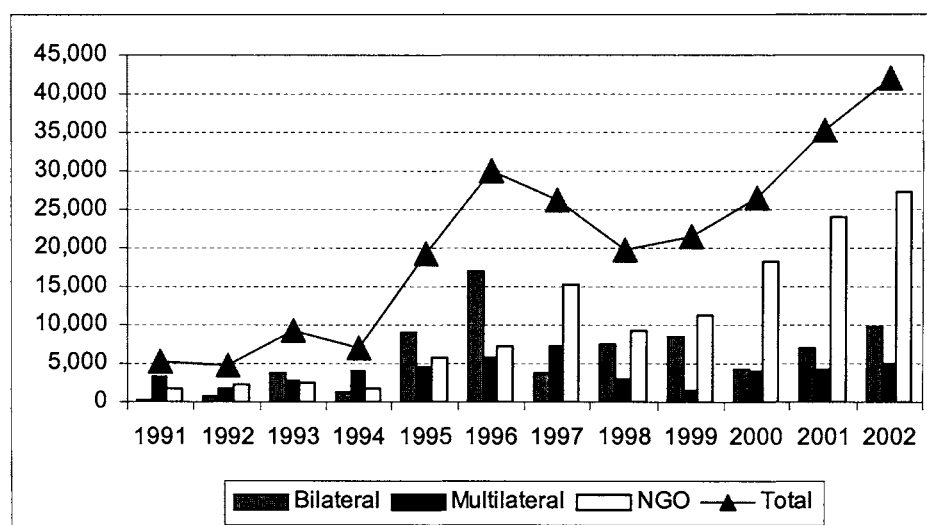
Source: World Bank (2004).

**3.27 Ethiopia does not have an explicit policy regarding the delivery of family planning services, although service providers have a few guidelines to follow.** In 1996, the MOH published national guidelines for family planning services which encompass facility-based, community-based outreach, and social marketing modalities (Ministry of Health, 1996). A curriculum was developed later for the training of community-based reproductive health agents (CBRHAs) (Ministry of Health, 2003). Guidelines for the provision of contraceptives state that a range of family planning methods should be offered, which typically include oral contraceptive pills (OCPs), condoms, foaming tablets, injectable contraceptives, implants, intrauterine contraceptive devices (IUDs), and female and male sterilization (Ministry of Health, 1996). Delivery of FP services also depends on procurement of contraceptive commodities, service infrastructure, sector and service integration, public-private partnerships, as well as effective management and supervision.

**3.28 Family planning (FP) commodities are largely funded through external assistance, including NGOs.** Figure 3.4 shows the trends in donors' expenditures for

population assistance in Ethiopia by channel of distribution.<sup>37</sup> The total expenditures by donors have steadily increased since 1995 with some fluctuations, following the 1994 International Conference of Population and Development (ICPD) held in Cairo. Bilateral channels have also increased their expenditures according to recent trends. Funding and technical support predominantly comes from the United Nations Population Fund (UNFPA), the United States Agency for International Development (USAID), and the David and Lucile Packard Foundation. Other major organizations that support family planning programs in Ethiopia include the International Planned Parenthood Federation (IPPF), the German Technical Cooperation (GTZ), the German Funding Agency for International Development (KfW), Marie Stopes International Ethiopia (MSIE), Pathfinder International, and the UK Department for International Development (DFID).

**Figure 3.4: Donors' Expenditures for Population Assistance in Ethiopia, by Channel of Distribution, 1991-2002 (thousand of constant 1993 US\$)**



Source: Authors' calculations based on UNFPA Ethiopia figures.

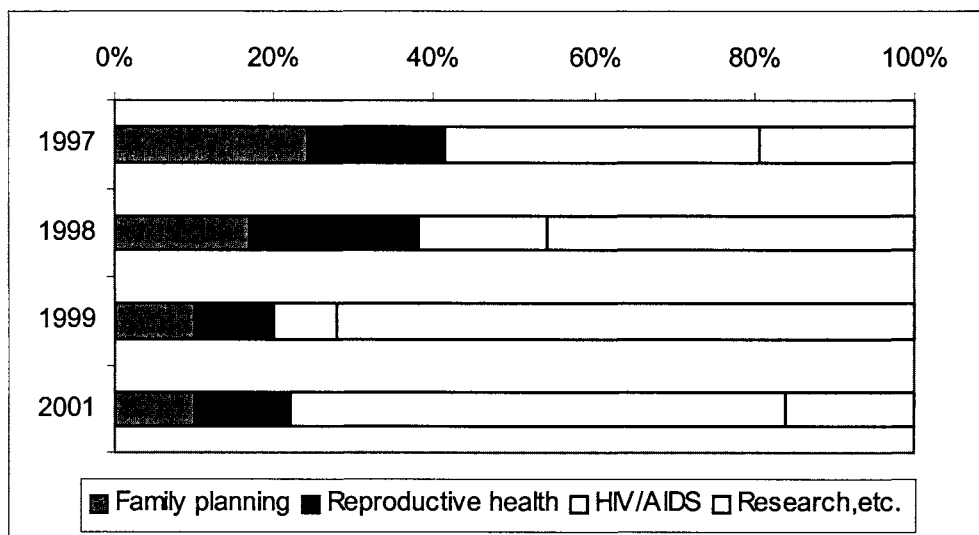
**3.29 The heavy reliance on external funding to cover the cost of contraceptive commodities raises the issue of program sustainability.** Program implementation is very susceptible to the unpredictability of external finances in terms of amounts and timing of disbursement, which is often beyond the control of the Government of Ethiopia (GoE). Therefore, problems with planning, implementation, and sustainability of the program are plentiful.

<sup>37</sup> "The bilateral channel includes funds that flow directly from donors to Ethiopia. The multilateral channel includes general funds that are not (necessarily) earmarked for specific population activities which multilateral organizations receive from developed countries, funds from developing countries, and interest earned on income. The NGO channel comprises funds from foundations and general contributions to NGOs active in the field of population and bilateral expenditures for specific population activities that are executed by NGOs." (UNFPA Glossary of Terms).

3.30 On the other hand, a large portion of the salaries, training, and other administrative costs of health workers providing RH/FP (including HIV/AIDS) services in public health facilities are covered by the Government of Ethiopia. The public sector is the major provider of family planning and HIV/AIDS services in the country. MOH data show a modest increase in FP/RH services between 1996 and 2002, from 1.78 million Birr (US\$1 = Birr 8.6 in 2004) to 2.24 million Birr in 1998 and 3.22 million Birr in 2002 (Ministry of Health – Family Planning Department, 2004, 2005). There has also been an increase from donors rising from 1.10 million Birr in 1996 to 4.39 million Birr in 2002 (Mekonnen, 2004).

3.31 However, increasing portions of FP/RH funds are being diverted to HIV/AIDS mitigation activities, as it has been the case in many other countries. Figure 3.5 shows the recent changes in proportion spent on each activity in sub-Saharan African countries, including Ethiopia. From 1997 to 1999, spending on research, data, and population policy analysis expanded rapidly, whereas spending on the other three activity categories (i.e. family planning, reproductive health, and HIV/AIDS) declined to less than 30 percent. Although spending on family planning remained proportionately constant through 2001, spending on HIV/AIDS and STI related activities increased drastically. As HIV/AIDS becomes an increasingly dominant policy issue, this trend is to be watched. In fact, future family planning program strategies may have to incorporate HIV/AIDS as a core component.

Figure 3.5: Government Expenditures on Population Programs by Activity in Sub-Saharan Africa, 2001



Source: UNFPA (2006).

## CHAPTER 4. CONCLUDING REMARKS

4.1 **Ethiopia emerges as a demographic giant, with a high dependency ratio and a predominantly young population concentrated in the rural Highlands.** The population is estimated (mid-2005) at 78 million, making Ethiopia the second most populated country in sub-Saharan Africa. Nearly 44 percent of the Ethiopian population is under 15, and 3.1 percent is over 65, implying that on average each non-dependent has to support, in addition to itself, about one other dependent. Moreover, the population continues to grow at a rapid pace with an estimated expansion of almost two million people every year and it stands to double in about 30 years. Ethiopia's population is rapidly exhausting its natural resources and increasingly exceeding its land carrying capacity.

4.2 **A Malthusian reading of Ethiopia's current situation does have some appeal.** Following the exogenously induced decline in child and infant mortality, population growth has rapidly grown since the 1950s to peak at around 3.0 percent in 1990. Since then, fertility has started to decline, though at 5.7 (DHS 2005) the total fertility rate (TFR) remains relatively high, even when compared with the sub-Saharan African average. Population growth is now estimated at about 2.5 percent per year. This rapid expansion of the population went hand in hand with an increase in land pressure and environmental degradation.<sup>38</sup> Land holdings per rural person declined from 0.50 ha in the 1960s to 0.21 in 1999. Moreover, a land-poor class is emerging with 20 percent of the rural population reported to have insufficient land to meet half of its cereal caloric needs with the current production technology. The adoption of new agricultural production techniques remains limited and over the past decade and a half, agricultural GDP has struggled to keep pace with population growth. It is estimated that five to seven million people are in need of food aid every year, and the threat of recurring and larger (often drought-related) famines looms large. In 2003, about 14 million people were threatened with starvation. Clearly, Malthusian forces to restore mortality rates to their original levels and restore the land-labor ratio appear to be at work, though fortunately major human disasters have been averted through international assistance and regular, and at times, massive amounts of food aid. In addition, voluntary reduction in fertility through delays in the age at marriage, another key response posited by Malthus to slow down population growth, is emerging. Couples also express strong needs for family planning services.

4.3 **Nonetheless, a Boserupian-type response appears feasible and is happening, though so far with limited success.** Much more concerted efforts will be needed to foster the technological and institutional changes needed to boost agricultural production. As argued by Ester Boserup, increasing population pressure may actually generate the conditions to induce the technological and institutional changes necessary to boost agricultural production. Indeed the GoE's efforts to enhance the use of modern land saving technologies as well as its latest adaptations to the land policy to generate more secure and transferable land tenure rights could be seen as Boserupian responses to Ethiopia's population pressure. However, the behavioral and institutional changes necessary to implement these policies effectively require time and the resulting increase in agricultural productivity seems to continue to run behind the growth in

---

<sup>38</sup> Grepperud (1996) is one of the few empirical studies which credibly and empirically establish a causal link between population pressure and soil erosion in Ethiopia.



population. Moreover, the modalities under which food aid is procured and distributed have in the past contributed to a decline in cereal prices which has positively affected the welfare of most of the net food buyers (of which many are poor), but has also generated disincentives to the net cereal sellers in the cereal producing surplus areas. Food-aid modalities causing less distortion such as the local purchase of food and cash as opposed to food transfers could be more productive and are currently being implemented under the new Productive Safety Net program. In general, a much more effective implementation of the current rural development policies and more far-reaching and immediate institutional change may be needed to trigger the necessary boost in agricultural production. This may require a more fundamental shift from a top-down to a bottom-up approach in the design and implementation of the development strategies.

**4.4 In addition, demographic change does not only affect economic growth through its effects on factor ratios and relative factor prices, but also through its effect on the age structure.** In particular, population growth exogenously induced through a decline in mortality rates at first hampers economic growth by increasing the dependency ratio and reducing the savings and investment rates. Yet, when followed by a decline in fertility, population growth will slow down, the dependency ratios will decline, young people reaching working adult age will boost the labor force, and savings and investment rates will increase, all providing the country with a (temporary) demographic bonus. However, as the demographic transition proceeds further to a low mortality and low fertility equilibrium, this demographic gift for economic growth will disappear. The benefits from this demographic bonus can be large and it was estimated that up to one third of East Asia's economic miracle (6.11 percent average growth between 1965 and 1990) could be attributed to the change in its population's age structure. Moreover, the more rapidly a population passes through the demographic transition, the faster it can capture its bonus and reduce poverty.

**4.5 In effect, Ethiopia is poised to capture its demographic bonus, though this will not come automatically and will require a more rapid decline in fertility as well as sound economic policies fostering labor intensive growth.** As the decline in fertility has started in earnest (in effect putting Ethiopia in the second phase of its demographic transition), Ethiopia may soon start to benefit from the demographic bonus. This will approximately happen when the rate of growth in its working age population exceeds the rate of growth in the overall population. This raises the question of how the decline in fertility comes about, and in particular, what the relative roles of overall development<sup>39</sup> as well as more population-specific oriented policies and interventions are in accelerating this decline. For now, we conclude that the GoE adopted a National Population Policy (NPP) in 1993 acknowledging the need for population-specific policies and interventions. However, the implementation record of this policy has been mixed, and its impact rather modest. Similarly, the provision and quality of family planning services has, until most recently, been quite limited, though important improvements have been observed over the past few years, often instigated by non-profit organizations and development partners in response to the large unmet demand for contraceptives by women. Moreover, for the increase in labor supply to be productively employed and to translate into increased savings and investments, a sound policy environment will be necessary including a business friendly

---

<sup>39</sup> These include among others policies to foster education, agricultural production, access to infrastructure, a better environment, and gender equity.

investment climate, fiscal discipline, relatively open and competitive markets, and substantial investment in basic education.

## PART II: POPULATION GROWTH, DEVELOPMENT, AND CONTRACEPTION

Through the adoption of a National Population Policy (NPP) in 1993, the incorporation of demographic considerations in estimating the costs of reaching the MDGs in 2005, and inclusion of population growth-related outcome targets in the Plan for Accelerated and Sustained Development to End Poverty (PASDEP),<sup>40</sup> the Government of Ethiopia has indicated the importance it places on reducing population growth in fostering economic growth and reducing poverty. The key policy levers to reduce fertility are to: 1) accelerate economic growth, including more concerted efforts to stall land degradation,<sup>41</sup> 2) foster (formal) female education, and 3) implement more vigorously the NPP.<sup>42</sup> More recently, the GoE has complemented its focus on the demand-side with more attention to the supply-side issues (i.e. the availability and distribution of contraceptives) through the accelerated expansion of primary health care facilities, the major vehicle for providing family planning services, and the introduction of the health service extension agents program, in particular, the explicit incorporation of family planning as one of its core activities.<sup>43</sup>

This part of the report seeks to assess how these strategies and policies are likely to affect the demographic outlook for Ethiopia and how decelerated population growth is likely to affect the evolution of household welfare and poverty. The factors in the demographic balancing equation (crude death rates, crude birth rates, and migration) are revisited and their relative importance in the Ethiopian context is examined. In particular, we use the Demographic and Health Survey 2000 as well as the Pathfinder Survey 2004 complemented with a Health Facility Survey (HFS) 2005 to empirically quantify the effects of a host of behavioral and socio-economic factors such as age at marriage, contraceptive use, income, primary and post-primary female adult education, child mortality, female empowerment, ethnicity, religion, access to sanitation, etc. as well as the

---

<sup>40</sup> Ministry of Finance and Economic Development (2006b) [this strategic document is also known as the Ethiopia's second Poverty Reduction Strategy Paper (PRSP)]. The specific population growth-related outcome/output targets include a reduction in the total fertility rate (TFR) from 5.4 in 2004/05 to 4.0 by 2009/10 {the base figure comes for the DHS 2005, 5-year prior to the survey reference period}, an increase in the contraceptive prevalence rate (CPR) from 15 percent in 2004/05 to 60 percent in 2009/10, a reduction in under-five child mortality from 123 per 1,000 in 2004/05 to 85 per 1,000 in 2009/10, and maintaining the prevalence of HIV at current levels.

<sup>41</sup> The proposed growth strategy for the next five years is laid out in detail in the PASDEP (Ministry of Finance and Economic Development, 2006b). It seeks, in particular, to generate a massive push for growth through intense agricultural and private sector development linked with substantial public investment in infrastructure and pursued in a geographically differentiated manner, while managing risks and volatility and unleashing the potential of Ethiopia's women.

<sup>42</sup> The GoE's view on how best to address population growth was outlined by Mekonnen (2004) during the last major population conference in Ethiopia celebrating the 10-year anniversary of the NPP adopted in 1993 and reviewing progress on population issues since enacting the NPP.

<sup>43</sup> Under this program, the GoE introduces two health service extension workers in each Peasant Association (PA) or *kebele* which have on average about 5,000 inhabitants. The health extension workers provide key health services such as personal and environmental hygiene information, child immunization, and family planning. A community promotion program centered on volunteer/private sector community promoters, traditional birth attendants working under the guidance of the health extension worker, will provide support to households for behavioral change (e.g. breast-feeding, complementary feeding, immunization, use of bed nets, safe delivery, etc.).

presence of family planning on measures of fertility and mortality. Attention is paid to the effectiveness of ongoing family planning activities in fostering contraceptive use and reducing fertility.

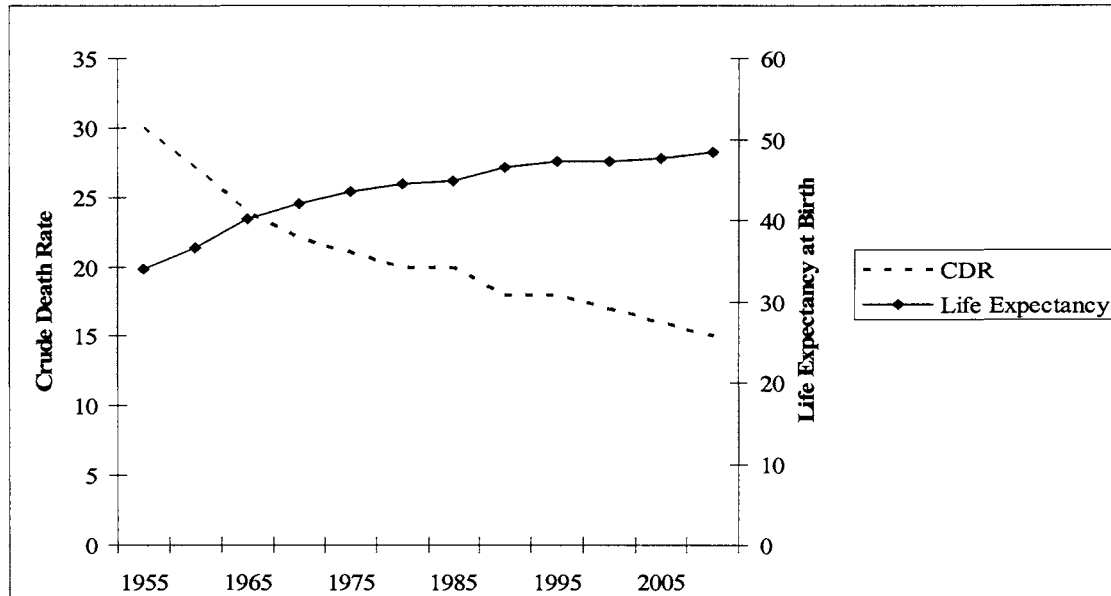
Given the relative importance of these different factors affecting mortality and fertility, we simulate the effect on the demographic outlook for Ethiopia of the different policies bearing on population growth as anticipated under the PASDEP and the MDGs. In particular, the combined effects of sustaining economic growth, reducing child mortality rates, reaching universal primary education by 2015, and achieving broader coverage of family planning, while containing HIV infection rates at current rates, will be examined. The implications of different population growth scenarios for economic growth and poverty reduction are discussed subsequently.

The determinants of mortality are analyzed in Chapter 5, while Chapter 6 empirically examines the determinants of fertility, including the effectiveness of family planning programs in reducing fertility. Chapter 7 simulates the effects of key interventions proposed under the National Population Policy (NPP) and the PASDEP on the demographic profile and estimates the net welfare effects of an accelerated decline in population growth through a more vigorous expansion of family planning services. Chapter 8 synthesizes the key insights from Part II.

## CHAPTER 5. MORTALITY RATES IN PERSPECTIVE

5.1 **Crude death rates have substantially declined over the past 50 years** (from about 30 per 1,000 people in 1955 to an estimated 15 in 2005) (United Nations, 2006). At the same time, life expectancy rose from about 34 years<sup>44</sup> for both sexes (Figure 5.1). Indeed, life expectancy in Ethiopia has risen unlike some other African countries (such as Botswana and Zimbabwe) where life expectancy has sharply decreased due to HIV/AIDS. The critical force behind this rapid decline in the crude death rate (CDR) is the decline in infant and under-five child mortality rates (U5MR). The infant mortality rate (IMR) declined from 199 in 1950 to 90 (United Nations, 2006) or 77 (DHS 2005) in 2005. Similarly, it is estimated that the U5MR has declined from 216 in 1984 (Central Statistical Authority, 1984) to 157 (United Nations, 2006) or 123 (DHS 2005) in 2005. Although the precise size of the decline varies across data sources, the reduction of mortality rates for infants and children under the age of five has been substantial over the past years.

Figure 5.1: Life Expectancy and Crude Death Rates in Ethiopia, 1955-2005



Source: United Nations (2006).

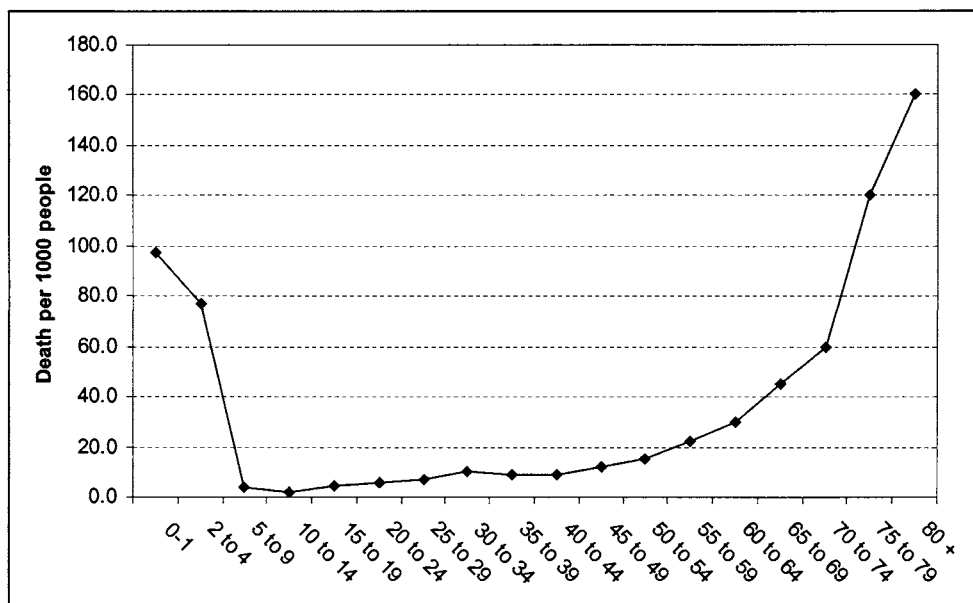
5.2 **Yet, there is substantial scope for further rapid declines in mortality.** With 77 per 1,000 infants dying before their first birthday and 123 children dying before they reach the age of five (DHS 2005), mortality remains very high and at 48, life expectancy remains low. Ethiopia has just begun the second phase of its demographic transition and mortality rates must decline much further to complete the transition and reach the levels of developed countries. In section 5.1 we review how trends in infant and child mortality, maternal mortality, and the prevalence of HIV/AIDS are likely to affect future mortality rates. Section 5.2 examines the

<sup>44</sup> World Bank (2007d) estimates life expectancy at 42 for men and 43 for women.

socio-economic determinants of under-five child mortality as well as the anticipated effects on mortality rates in light of the Government’s efforts to reach the MDGs.

### 5.1 The Dynamics of Mortality

Figure 5.2: Mortality Rates by Age in Ethiopia, 2000



Source: DHS 2000 and authors’ calculations based on McFalls (2003).

5.3 **A J-shaped mortality curve.** To understand the dynamics behind mortality rates in Ethiopia, we decompose the crude death rate (the number of deaths in a year per 1,000 people) into two factors: 1) the death rate by age groups, and 2) the shares of these age groups in the overall population. These parameters permit us to estimate the contribution of the different age groups to the overall CDR. While statistics on the infant mortality rate (IMR) and the child mortality rate (CMR) have been collected for some time in Ethiopia, age-specific adult mortality rates are much harder to come by. The first such rates for adults between 15 and 49 years were reported in the Demographic and Health Survey 2000. Plotting the age-specific mortality rates (ASMRs) from the DHS, using the US death rates in 1900 as approximations for missing age categories (5-14 and 49+), yields a J-shaped curve of mortality (Figure 5.2). The probability of dying is especially high in the first years of life (about 10 percent for those below one and about 8 percent for those between one and four), declining sharply thereafter and slowly increasing from 15 years onwards until about 49, after which mortality rates increase sharply again.

**Table 5.1: Age Structure of the Ethiopian Population, Age-Specific Mortality Rates (per 1,000), and Contribution to CDR by Age, 2000**

Age category (years)	Share in total population (%) <sup>1)</sup>	Mortality rates (No. of deaths/ 1,000 people in age category) <sup>2)</sup>	Contribution to total death rate (No. of deaths/1,000 people)	Share in total population (%)	Mortality rates (No. of deaths/ 1,000 people in age category)	Contribution to total death rate (in No. of deaths/1,000 people)
<b>0 to 1</b>	4.3	97	4.2	4.3	97.0	4.2
<b>2 to 4</b>	12.6	76.7	9.7	12.6	76.7	9.7
5 to 9	15.3	2	0.3			
10 to 14	13.5	2	0.3			
<b>Total 5-14</b>				28.8	2.0	0.6
15 to 19	11.3	4.6	0.5			
20 to 24	8.0	5.7	0.5			
25 to 29	7.3	6.8	0.5			
30 to 34	4.9	10.2	0.5			
35 to 39	4.9	9.2	0.4			
40 to 44	4.0	8.9	0.4			
45 to 49	3.6	11.8	0.4			
<b>Total 15-49</b>				44.0	7.3	3.2
50 to 54	2.4	15.0	0.4			
55 to 59	2.5	22.0	0.6			
60 to 64	1.8	30.0	0.5			
65 to 69	1.4	45.0	0.6			
70 to 74	1.0	60.0	0.6			
75 to 79	0.6	120.0	0.7			
80 +	0.6	160.0	1.0			
<b>Total 49+</b>				10.3	42.3	4.4
<b>Total</b>	<b>100</b>		<b>22.0</b>	<b>100</b>		<b>22.0</b>

Source: Authors' calculations based on DHS 2000.

Notes: Figures in italic are estimates.

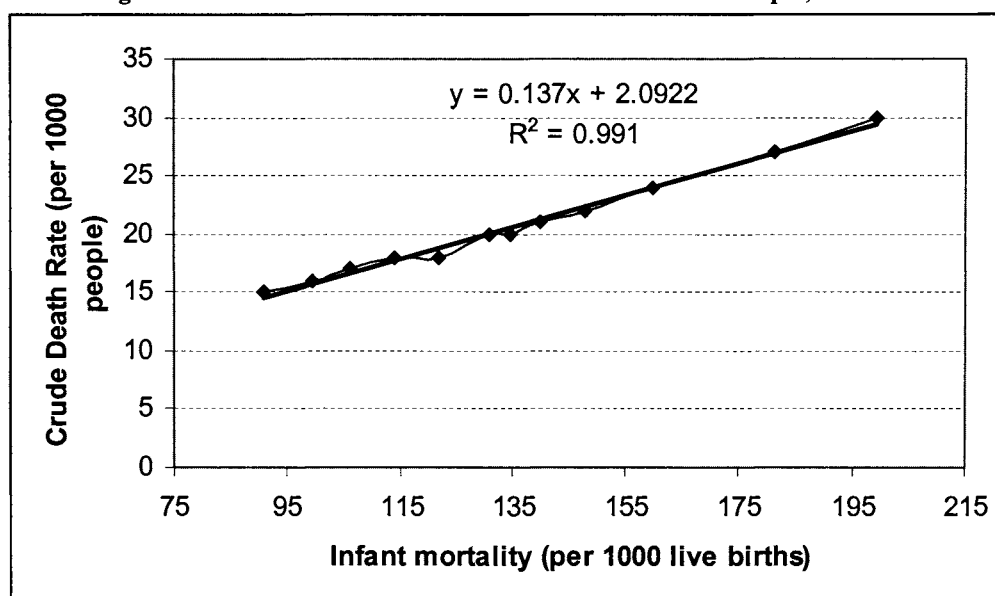
<sup>1)</sup> The population share for the 0-4 year old category is 16.9 percent. It is only reported for the 0-4 year olds as a whole and not for the 0-1 and 2-4 year olds separately. We attributed an equal share to each year.

<sup>2)</sup> Mortality rates were not reported for the 5-14 and above 49 years olds. We assigned the numbers in the tables based on the observed patterns in other countries as well as reported mortality rates among male adults in the US in 1900 (McFalls, 2003).

**5.4 The fact that one in six Ethiopians is less than five years old, combined with high CMR, means that annual deaths are concentrated among children under five.** The contribution of the different age groups to the overall crude death rate (CDR) is obtained by multiplying the ASMRs by their respective share in the total population (Table 5.1). Based on these assumptions, the CDR is estimated at 22 per 1,000, which is somewhat higher than the UN estimate of 17 in 2000. Since the 2007 Census data are not yet available, it is hard to gauge which estimates are more accurate. Our focus here is not on the absolute CDR per se, but rather on the forces changing the CDR over time. We find that 4.2 out of 22 deaths per year result from children dying before reaching the age of one; 9.7 out of 22 deaths from children dying between the ages of one and four. Together, deaths among children under age four account for 63 percent (=13.9/22) of the total number of deaths in Ethiopia, while deaths among the 15-49 year olds only account for 15 percent of the CDR.

**5.5 Reductions in child mortality will substantially reduce the CDR and thus foster population growth.** To illustrate the immediate effect of this, we examine the effect of the observed drop in 0-1 and 2-4 year olds' mortality rates from 97 and 76.7, respectively (DHS 2000) to 77 and 50 (DHS 2005), holding population shares and mortality rates among other age categories constant. This observed drop in mortality among those below five years old between 2000 and 2005 cut the CDR from 22 to 17.8 per 1,000 people, which corresponds to an increase in the population growth rate of 0.42 percentage points.<sup>45</sup> By comparison, the current population growth rate is estimated at 2.5 percent. Similarly, if we regress the evolution of the CDR on the evolution of the IMR as reported by the United Nations (2006) (Figure 5.3), we find that a decrease in infant mortality of 10 children per 1,000 live births is associated with a decrease in the CDR by 1.37 per 1,000 people translating to an increase in population growth of 0.137 percent. This coefficient implicitly also captures the corresponding decline in mortality among the children between ages one and four, as the decline in IMR and CMR usually move in tandem.

**Figure 5.3: The Relation between the CDR and IMR in Ethiopia, 1955-2005**



Source: Authors' calculations based on United Nations (2006).

**5.6 Thus, if reductions in child mortality are not offset by an equal drop in the crude birth rate, population growth will remain high and even increase in the short run.** Section 5.2 will further explore the socio-economic determinants of child mortality and gauge the anticipated decline given the estimated relationships and the current development strategies and interventions.

<sup>45</sup> To see this:  $22 - 17.8 = 4.2$  less deaths per 1,000 people or a decrease in the CDR of 0.42 percentage points. Given that total population growth equals  $CBR - CDR$ , it follows that a decline in CDR by 0.42 percentage points equals an increase in the population growth rate of 0.42 percentage points.



5.7 **While maternal mortality rates are extremely high, their expected declines following efforts to reach the MDGs are unlikely to substantially affect the CDR or population growth given the limited contribution of adult death to the current CDR.** Ethiopia has one of the highest maternal mortality ratios in Africa and the world, estimated at 673 per 100,000 live births in 2005 (DHS 2005). This is related to the low levels of antenatal care and birth attendance by health professionals in Ethiopia—especially among the poor—as well as early age at marriage and first birth. Among the 20-35 year olds, about 30 percent of all female adult deaths follow from maternal deaths at birth. The MDGs call for reducing the maternal mortality rate by three-quarters between 1990 and 2015, which will be challenging given the extreme shortage of obstetricians and well trained professional staff to attend births. Expansion of clinical services is the only route to significantly reduce the rate, but this will take more time and resources.

5.8 **At current levels, HIV/AIDS is unlikely to substantially affect the CDR.** The national adult HIV prevalence rate was estimated at 3.9 percent of adults 15-49 in 2004 (Ministry of Health – Disease Prevention and Control Department, 2004), low for East and Southern Africa and closer to the rates observed in West African countries (Table 5.2). However, the Demographic and Health Survey 2005 has found a national adult HIV prevalence estimate of 1.4 percent, though this is likely underestimated because of the no response factor.<sup>46</sup> The mortality rates shown in Table 5.1 already capture a substantial amount of the AIDS-related deaths, as they reflect the trends between 1993 and 1999 and HIV/AIDS prevalence rates have leveled off since. On the other hand, the decline in the number of women of child-bearing age could reduce the crude birth rate. A more detailed account of the assumptions made regarding the effect of HIV/AIDS on our population projections is presented in Chapter 7. Overall, it is anticipated that the HIV/AIDS epidemic is unlikely to change the demographic equation in Ethiopia, provided prevalence rates are maintained at the current levels and reduced in the future.

**Table 5.2: HIV Prevalence Rate of Adults aged 15-49 (percent) in Selected Sub-Saharan Countries**

Ethiopia	3.9
Botswana	37.3
Chad	4.8
Ghana	2.2
Kenya	6.7
Mozambique	12.2
Niger	1.2
Nigeria	5.4
Tanzania	7.0
Uganda	4.1
Zambia	15.6
Zimbabwe	24.6

*Source:* Ministry of Health – Disease Prevention and Control Department (2004) and World Bank (2006d).

<sup>46</sup> The 2005 national antenatal care surveillance estimates the HIV/AIDS prevalence rate at 3.5 percent.

## 5.2 Socio-Economic Determinants of Child Mortality

5.9 A host of factors affect child mortality including different individual characteristics (gender, birth order, birth spacing, multiple births, etc.), household characteristics (nutritional status, genetic endowments, education and income of parents, and health knowledge and practices), and access to community infrastructure (quantity and quality of water provisions, sanitation services, and access to health facilities).<sup>47</sup> The relative importance of these different factors in determining the probability of dying before the age of five is estimated using the data from the DHS 2000. The results are reported in Table 5.3.

**Table 5.3: Socio-Economic Determinants of Under-Five Child Mortality in Rural and Urban Areas of Ethiopia**

Independent Variables	Rural			Urban		
	Rural (1)	Rural (2)	Rural (3) <sup>1)</sup>	Urban (4)	Urban (5)	Urban (6)
<b>Child's Characteristics</b>						
Female Child	-0.022* (2.08)*	-0.022* (2.05)*	-0.022^ (1.9)^	0.005 -0.26	0.004 -0.2	0.016 -0.71
<b>Mother's Characteristics</b>						
Mother's Age	-0.02 (2.65)**	-0.02 (2.64)**	-0.016 (1.96)^	0.044 (2.89)**	0.042 (2.76)**	0.053 (2.81)**
Mother's Age Squared	0.00 (2.55)*	0.00 (2.54)*	0.00 (1.91)^	-0.001 (2.83)**	-0.001 (2.71)**	-0.001 (2.70)**
Mother's Weight	0.00 (0.45)	0.00 (0.42)	0.00 (0.89)	0.00 (0.87)	0.00 (0.78)	0.00 (1.85)
Mother's Height	0.00 (2.33)*	0.00 (2.39)*	0.00 (1.37)	0.000 (2.63)**	0.000 (2.39)*	-0.001 (3.70)**
Mother's Education (Years)	-0.016 (2.87)**	-0.016 (2.79)**	-0.012 (1.83)^	-0.006 (2.16)*	-0.008 (2.71)**	-0.007 (2.08)*
Female Headed Household (1=yes, 0=no)	-0.013 (0.85)	-0.012 (0.79)	-0.007 (0.39)	0.008 (0.36)	0.016 (0.75)	0.022 (0.81)
<b>Wealth Quintile<sup>2)</sup></b>						
Quintile 2				-0.039 (1.32)		-0.034 (0.90)
Quintile 3	-0.014 (1.09)		-0.017 (1.19)	0.051 (1.68)		0.081 (2.08)*
Quintile 4	0.001 (0.03)		-0.015 (0.78)	-0.015 (0.51)		-0.011 (0.29)
Quintile 5	-0.027 (1.37)		-0.006 (0.29)	-0.023 (0.61)		-0.028 (0.60)
<b>Wealth Score</b>						
Wealth Score		0.292			0.124	
Wealth Score Squared		-1.24			-1.12	
		-0.097			-0.101	
		-1.27			-0.92	

<sup>47</sup> The discussion on the correlates of child and infant mortality draws heavily from World Bank (2005c) and Mekonnen and Yimer (2005).

Independent Variables	Rural			Urban		
	Rural (1)	Rural (2)	Rural (3) <sup>1)</sup>	Urban (4)	Urban (5)	Urban (6)
<b>Infrastructure Access</b>						
Piped Water	-0.049 (1.97)*	-0.049 (1.95)	-0.051 (1.33)	-0.027 (0.72)	-0.017 (0.47)	-0.05 (0.94)
Uncovered Ground Water	-0.028 (2.32)*	-0.03 (2.43)*	-0.025 (1.44)	-0.054 (1.26)	-0.047 (1.09)	0.025 (0.32)
Covered Water	-0.023 (1.22)	-0.024 (1.28)	-0.003 (0.09)	-0.132 (3.10)**	-0.131 (3.04)**	-0.099 (1.34)
No Sanitation	0.011 (0.63)	0.01 (0.58)	0.003 (0.14)			
Flush-Toilet				-0.039 (0.54)	-0.045 (0.64)	-0.128 (2.02)*
Pit-Toilet				-0.014 (0.53)	-0.022 (0.84)	-0.034 (0.98)
Electricity	-0.099 (1.82)^	-0.1 (1.82)^	-0.101 (1.20)	-0.065 (1.99)*	-0.082 (2.52)*	-0.065 (1.45)
<b>Religion &amp; Region</b>						
Orthodox	0.017 (0.89)	0.016 (0.85)	-0.014 (0.47)	0.061 (1.39)	0.057 (1.31)	0.091 (1.67)
Muslim	0.051 (2.53)*	0.05 (2.53)*	0.048 (1.20)	0.137 (2.63)**	0.134 (2.58)**	0.18 (2.73)**
Tigray	0.024 (0.72)	0.025 (0.76)	0.074 (0.33)	-0.043 (1.07)	-0.04 (1.00)	-0.194 (1.32)
Afar	0.04 (1.31)	0.034 (1.140)	0.247 (0.80)	-0.1 (1.69)	-0.103 (1.76)	-0.181 (1.99)*
Amhara	-0.015 (0.51)	-0.013 (0.43)	0.477 (1.36)	-0.037 (0.9)	-0.03 (0.71)	-0.184 (1.50)
Oromiya	0.004 (0.14)	0.004 (0.14)	0.347 (1.23)	-0.013 (0.32)	0.001 (0.02)	-0.113 (0.59)
Benshangul/Gumuz	-0.013 (0.42)	-0.012 (0.39)	0.137 (0.42)	0.081 (0.9)	0.075 (0.83)	-0.172 (1.34)
SNNPR	0.034 (1.11)	0.034 (1.11)	0.354 (0.92)	-0.05 (0.97)	-0.033 (0.60)	-0.178 (1.52)
Gambilla	0.08 (1.98)*	0.082 (2.02)*	0.36 (1.09)	0.103 (1.6)	0.122 (1.85)^	-0.175 (1.38)
Harari	0.066 (1.8)^	0.066 (1.77)^	0.063 (0.27)	0.017 (0.49)	0.022 (0.61)	-0.082 (0.32)
Dire Dawa	-0.02 (0.46)	-0.021 (0.50)	0.173 (0.52)	0.006 (0.21)	0.008 (0.27)	-0.179 (0.82)
<b>Observations</b>	5876	5876	5501	1451	1451	1194

Source: World Bank (2005c).

Notes: Coefficients are reported as marginal probabilities; dependent variable takes on the value of one if the child died before reaching the age of five (0 otherwise). ^ indicates significance at 10 percent; \* significant at 5 percent; \*\* significant at 1 percent; robust (Huber-White) z-statistics in rows under coefficients. Estimates also control for censoring (selection at least five years prior to the survey). Omitted categories are: households using surface or rainfall water; households without access to any sanitation; Protestant and others; and Somali.

<sup>1)</sup> Specifications (3) and (6) are run using cluster dummies to proxy for infrastructure, prices, and environment.

The cluster dummies are not significant in the urban specification (6).

<sup>2)</sup> The poorest and second poorest households are the two left out quintiles in the rural sample; the poorest quintile is the left out quintile in the urban sample.

**5.10 Girls from rural areas are 2.2 percentage points less likely to die before reaching age five compared to boys.** This finding is consistent with higher survival chances for female infants associated with biological factors and not necessarily differential health investments. But it is also consistent with the empirical literature from sub-Saharan Africa which suggests no gender bias in investments in health, even though there appear strong gender biases in investments in education. The ‘boy bias’ in child mortality, however, does not hold in urban areas, where there is no difference in child mortality by gender of the child.

**5.11 Especially in rural areas, infant and child survival would benefit from postponement of early motherhood.** A rural mother who is five years older than the average is 10 percentage points less likely to suffer the loss of her young child (the median age at first birth is 19 years in rural areas and 20 in urban areas). Similarly, a related study reports that infants born to women under the age of 20 have 40 percent higher odds to die before their first birthday.<sup>48</sup> An early age at first child birth is closely related to an early age at marriage which has implications for fertility (Chapter 6). In 2005, about nine percent of all women between 20 and 49 had their first child by the age of 15 and 39 percent had their first child by the age of 18. At the same time, 31 percent of all women between 20 and 49 were married at the age of 15 and 62 percent were married by the age of 18. While younger women tend to marry somewhat later and thus also postpone their first births, by 2005, early marriage was still common: 24 percent of the 20-25 year olds were married by the age of 15 and about 50 percent by the age of 18. Slightly more than one quarter of the 20-24 year olds in 2005 had their first birth before reaching 18.

**5.12 There is a strong positive effect of mother's education on both child and infant mortality.** The robust empirical relationship established in the development literature between maternal education and child health clearly holds in Ethiopia as well. Given that the vast majority of mothers (over 90 percent) have not completed primary education, even a modest increase in female education has significant payoffs in improving child health, particularly in rural areas. Moreover, the influence of maternal education on IMR is significant even controlling for bio-demographic and maternal health services use. This finding points to the fact that the relationship between women’s education and infant mortality may be operating through unmeasured proximate variables, such as nutritional practices, sanitation/hygiene behaviors, and use of preventive and curative child health care services.

**5.13 Mothers in rural areas with an additional four years of education are 4.8 to 6.4 percentage points less likely to see their children die before the age of five.** In urban settings, the effect is less but still statistically strong: four more years of education reduces under-five mortality by between 2.4 and 3.2 percentage points.

**5.14 Mothers' nutritional status also affects under-five child mortality rates.** A mother's height, a proxy for nutritional status during childhood and adolescence, has a small but significant effect in all but one specification, indicating the persistence of poor health outcomes across generations. Somewhat surprisingly, and contrary to the findings based on bivariate analysis (World Bank, 2005c), household wealth did not effect under-five mortality rates in the

---

<sup>48</sup> Mekonnen and Yimer (2005).

multivariate analysis, i.e. after controlling for a host of other factors including the mother's weight (which is likely correlated with height though more sensitive to seasonal fluctuations).

**5.15 Access to clean water is an extremely important determinant of child mortality.** Children in rural households using uncovered ground water (spring or uncovered well) are two to three percentage points less likely to die before reaching the age of five than those in households using surface water. In the rural sample, 38 percent of households rely on surface or rainfall water, so this represents an area of great opportunity for effective interventions. Access to piped water (including communal taps) brings down the risk of childhood mortality even further, by five percentage points. The effect of safe water access is most pronounced in urban areas, where access to surface water is limited. Children from urban households with access to a covered water source are 13 percent less likely to die before reaching their fifth birthday than those relying on rain and surface water.

**5.16 Somewhat surprisingly, there was no evidence of a strong discernable effect of access to sanitation on child mortality rates.** This may be because of low variation in access to sanitation facilities, or because threshold effects mean that at least a minimum proportion of the community needs to use sanitation facilities to have an effect. In rural areas, 92 percent of households have no sanitation facility and the remaining eight percent use a traditional pit toilet. Even in urban areas, 30 percent of households reported not having a toilet facility, with most of the rest (66 percent) using traditional pit latrines. The result is especially worrisome as urban populations live more concentrated increasing the likelihood for contaminations and epidemics.

**5.17 Electricity is associated with reduced child mortality in both rural and urban areas.** Children from rural households with access to electricity are 10 percent less likely to die before reaching the age of five; children from urban households with electricity are 6.5 percent less likely to die before the age of five. However, the effect disappears once we control for community effects, indicating that electricity may be a proxy for access to other community services.

**5.18 Ceteris paribus, being Muslim increases the probability of premature death by five percentage points relative to being Protestant (the omitted category) in the rural sample and between a dramatic 13 and 18 percent among urban dwellers.** In particular, there are also large and statistically significant regional variations in under-five child mortality rates. Relative to children living in rural Somali communities, children in rural Gambella have an eight percent higher probability of dying before age five.

**5.19 These findings suggest that there is substantial scope for reducing infant and under-five child mortality in Ethiopia.** To illustrate this, we simulate the impact of giving all mothers four years of education and providing access to safe drinking water (piped water) to those households which are currently using surface or rainfall water.<sup>49</sup> Together, these two interventions would reduce child mortality by 6.8 percentage points in rural areas (or 68 deaths less per 1,000 live births) and 2.5 percentage points (or 25 deaths less per 1,000 live births) in

---

<sup>49</sup> For the rural households, we simulate the effect of providing piped water; for the urban, covered.

urban areas.<sup>50</sup> This suggests that when further combined with concerted efforts to delay the age at marriage; to expand family planning services to space births (Bhargava, Chowdhury, and Singh, 2005); and targeted interventions to boys, Muslim populations, and certain regions, child mortality can still be substantially reduced, even though this will take some time.

---

<sup>50</sup> In 2000, the average mother in the rural sample had less than 0.8 years of schooling; increasing this by 3.2 years increases the average rural child's chance of survival by 5.1 percentage points, bringing down the rural under-five mortality rate from 166 to 115 deaths per 1,000 live births. In urban areas, with higher average educational attainment (1.3 years) and a lower marginal effect of mother's education on child mortality, the decrease is a more modest 1.6 percentage points (or 16 deaths per 1,000 live births). Providing access to safe drinking water (piped water) to those households that are currently using surface or rainfall water would reduce child mortality in rural areas by 1.7 percentage points, but in the already well-serviced urban areas, by only 0.9 percentage points. Currently, 35 and 7 percent of all rural and urban households, respectively, use surface or rainfall water.

## CHAPTER 6. DETERMINANTS OF FERTILITY

**6.1 Fertility is affected by biological, behavioral, and socio-economic conditions.** Biological and behavioral determinants include age at marriage and use of contraceptives (itself linked in part to the availability of family planning services). Socio-economic determinants include women's level of education and empowerment status, household income, child mortality, and cultural factors. However, the relative importance of each of these variables in determining fertility levels and trends remains poorly understood, especially in the Ethiopian context.

**6.2 This chapter begins with a brief review of the evolution and current status of fertility in Ethiopia.** Section 6.2 presents our conceptual framework followed by an in-depth analysis in section 6.3 of the effects of biological and behavioral factors on fertility using the demographic perspective and including a discussion of how these factors are in turn determined by socio-economic factors, in effect using a structural approach. Section 6.4 seeks to directly quantify the relationship between fertility and different socio-economic factors using a reduced form regression framework.<sup>51</sup> An in-depth Ethiopia-specific discussion of the potential and effectiveness of family planning provisions in reducing fertility is presented in the final section.

### 6.1 Key Features of Fertility in Ethiopia

**6.3 Fertility has declined in Ethiopia over the past decades, but remains above sub-Saharan African averages.** The most commonly used measure to capture fertility is the total fertility rate (TFR). TFR measures the expected number of children per woman, assuming the currently observed fertility rates across all age groups remain constant. A replacement level fertility requires a TFR of slightly above 2, as some girls will die before they grow up to have their own children.<sup>52</sup> The TFR is obtained by aggregating the observed age-specific fertility rate (ASFR) across age groups of reproductive age women (15-49 years) (Table 6.1). In Ethiopia, TFRs have been calculated directly from two censuses (1984 and 1994) and three surveys (National Fertility Sample Survey NFS 1990 and Demographic and Health Survey DHS 2000 and 2005). The series of TFRs demonstrates a clear declining trend over the past two decades. The precise decline, however, is unclear given the differences in data collection (Census versus sample survey, with Census data generally considered to be less reliable) and the reference period used (whether based on a three or five year period preceding the survey). Broadly speaking, the TFR in Ethiopia declined substantially to 5.7 children per woman in 2005.<sup>53</sup>

---

<sup>51</sup> In contrast to a structural approach, in a reduced form regression framework no attempt is made to identify the pathways through which the socio-economic factors affect fertility. For example, education may affect fertility by increasing age at marriage and fostering contraceptive use. In a structural framework, it would be estimated by how much age at marriage and contraceptive use would increase if educational attainments of female adults were increased and by how much fertility would decline in response to an increase in age at marriage and contraceptive use. In the reduced form framework, these effects are jointly estimated and one cannot identify which channels are more important, reduction in age at marriage or increased contraceptive use.

<sup>52</sup> In a country like the United States, a TFR of 2.1 produces replacement level fertility. In a country with high mortality such as Sierra Leone, replacement level fertility would require a TFR greater than 3 (McFalls, 2003).

<sup>53</sup> Estimates of TFR depend on which reference period is used for the computation. The TFR based on the DHS 2005 has been estimated at 5.7 when using the five years preceding the survey year and 5.4 when using the three

**Table 6.1: Evolution of Total and Age-Specific Fertility Rates in Ethiopia, 1984-2005**

	1984	1990	1994	2000	2005
ASFR <sup>1)</sup>					
15-19	-	0.095	-	0.110	0.109
20-24	-	0.275	-	0.244	0.242
25-29	-	0.289	-	0.264	0.253
30-34	-	0.257	-	0.248	0.240
35-39	-	0.199	-	0.183	0.166
40-44	-	0.105	-	0.100	0.096
45-49	-	0.056	-	0.024	0.035
TFR	7.5	6.4	6.7	5.9	5.7

*Sources:* Censuses 1984 and 1994 (Central Statistical Authority, 1984, 1994); National Fertility Sample Survey 1990 (Central Statistical Authority, 1993); and Demographic and Health Surveys 2000 and 2005 (Central Statistical Authority, 2001 and Central Statistical Agency and ORC Macro, 2006).

<sup>1)</sup> For 1984 and 1994, TFR rates directly obtained from age-specific fertility rates (ASFRs) were revised upward due to underestimation (Gubhaju, 1997, 2002). Thus, we do not report the underlying ASFRs in the table to avoid confusion. ASFRs for the 1990 NFS are for the 12 months preceding the survey and rates for the DHS 2000 are for the five years preceding the survey (ASFRs are lower when shorter periods are used).

**6.4 Fertility in Ethiopia has been declining at a slightly faster pace over the past 15 years than the sub-Saharan African average** (Figure 6.1). The annual decline in TFR (0.1 per year) in Ethiopia has been slightly above the average (0.08 TFR per year) observed in the other sub-Saharan African countries in Figure 6.1. Countries with higher fertility include Mali (not in the figure), Niger, and Uganda, while neighboring Kenya and Tanzania have moved further in the fertility transition with estimated TFRs in 2003 of 4.8 and 5.0, respectively.

**6.5 There are major differences in fertility in Ethiopia by region, residence, education, and wealth** (Figure 6.2; see also, for instance, Fitaw et al., 2003). There is a large difference between urban and rural areas, TFRs of 3.3 and 6.4, respectively, in 2000 which widened by 2005, with rural women now having more than twice as many children (the TFR for 2005 is 2.4 in urban areas compared with 6.0 in rural areas). While most regions had TFRs higher than 5 in 2000, Addis Ababa had reached a TFR below replacement level, a rather remarkable and unique phenomenon which we will discuss below.

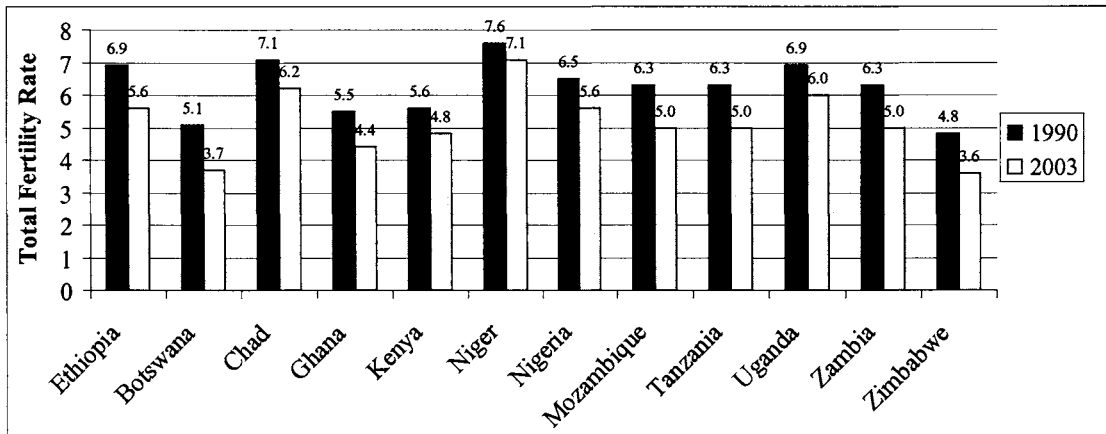
**6.6 Uneducated mothers have twice as many children as women with at least some secondary school education.** The fertility reducing effect of education is large and gets stronger as women age (Figure 6.3). For the oldest age group (40-49 years), few women have high levels of education: 95 percent have no education, resulting in larger fluctuations in the graph due to the limited number of observations.

---

years preceding the survey year. Similarly, the 2000 TFR was estimated at 5.9 when using five years preceding the survey year and 5.5 when taking into account births in the three years prior to the survey year.



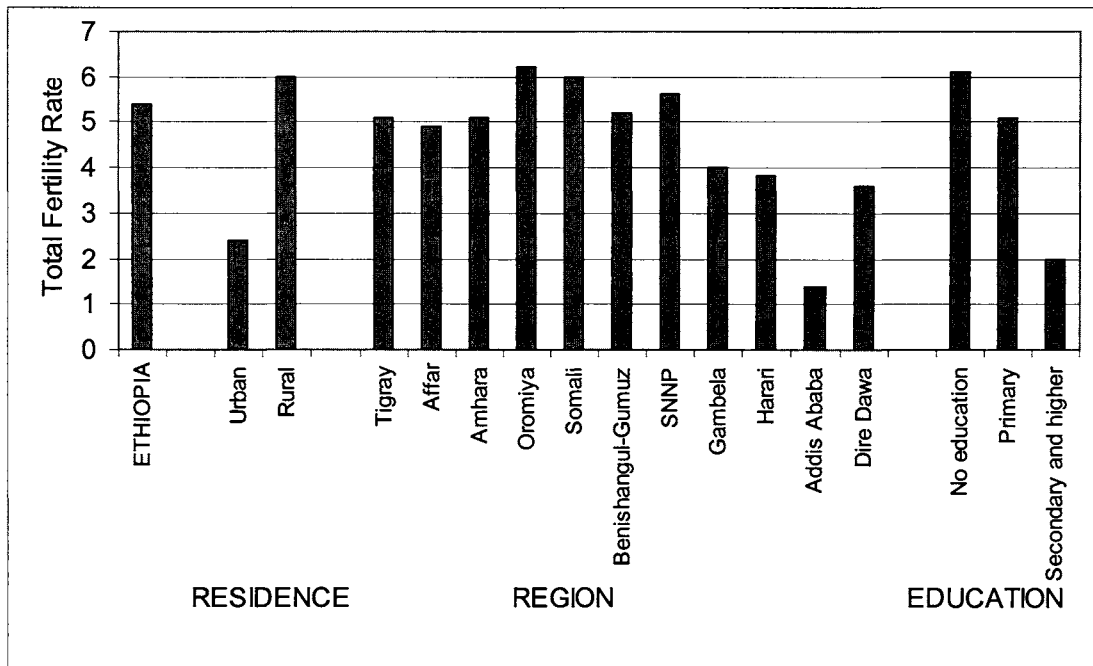
**Figure 6.1: Total Fertility Rates in Selected Sub-Saharan African Countries 1990 and 2003**



Source: World Bank (2005d).

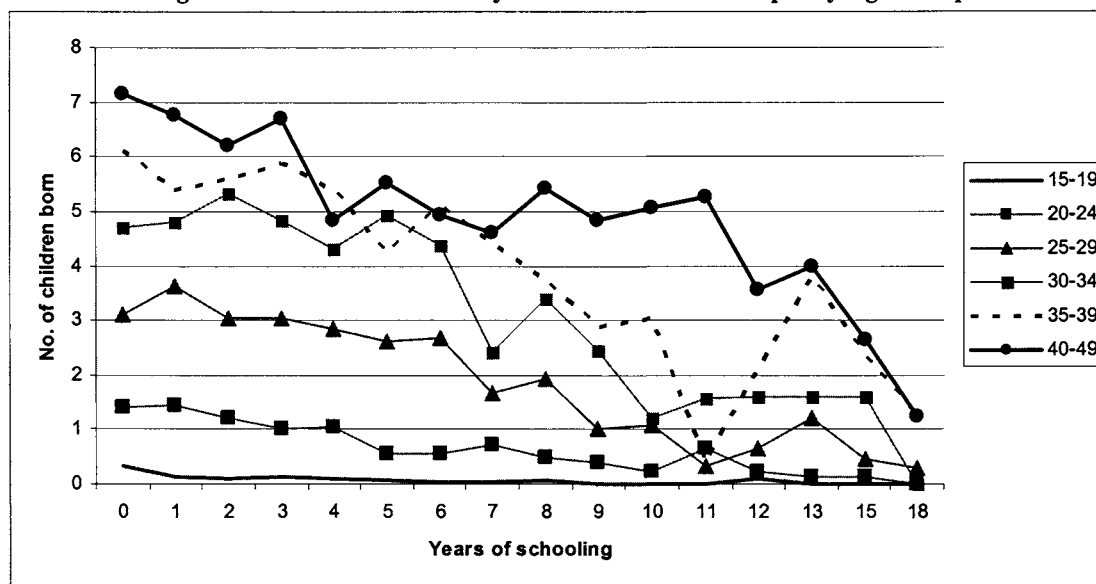
Note: Ethiopia's TFR of 5.6 refers to 2003 (i.e. between the DHS 2000 and 2005).

**Figure 6.2: Total Fertility Rates in Ethiopia by Selected Background Characteristics**



Source: DHS 2005 with TFR based on the five years preceding the survey.

Figure 6.3: Cumulative Fertility and Education in Ethiopia by Age Group



Source: DHS 2005.

6.7 There are large wealth differentials, with a TFR of 6.4 for the poorest quintile and 3.9 births per woman in the richest quintile in 2000, indicating a link between high fertility and poverty (Table 6.2). The rich also tend to live in urban areas and tend to be more educated, indicating the need for multivariate analysis to establish the net effects of these factors (residence, education, and wealth), as well as the role of other determinants.

Table 6.2: TFRs and ASFRs by Residence and Wealth, 1990-2005

Age	Trends			Residence in 2000		Wealth in 2000	
	1990	2000	2005	Urban	Rural	Poorest Quintile	Richest Quintile
ASFR (per 1,000 women)							
15-19	95	110	109	60	123	127	70
20-24	275	244	242	149	266	274	161
25-29	289	264	253	156	289	296	192
30-34	257	248	240	160	264	251	192
35-39	199	183	166	97	199	195	112
40-44	105	100	96	33	109	111	55
45-49	56	24	35	4	27	24	1
TFR	6.4	5.9	5.7	3.3	6.4	6.4	3.9

Sources: Central Statistical Authority (1993) and DHS 2000 and 2005.

Note: Rates for the 1990 NFS are for the 12 months preceding the survey and rates from the DHS are for the five years preceding the survey.

## 6.2 Unbundling Fertility – A Conceptual Framework

6.8 Two approaches have been used to analyze the determinants of fertility. Demographers have mainly focused on the direct (*proximate*) determinants which are biological and behavioral in nature. These include the exposure to the risk of conceiving (percent of

women who are in union), the use of contraceptives (linked in part to the availability of services), the rates of abortion and pathological sterility, and postpartum infecundability (affected by postpartum abstinence and duration of breastfeeding). The relative effect of each of these variables on the total fertility rate (TFR) is elegantly captured in a model developed by John Bongaarts (1978) which has become the workhorse of demographers. This model is often used to study the effect of changes in age at marriage and contraceptive use on fertility.

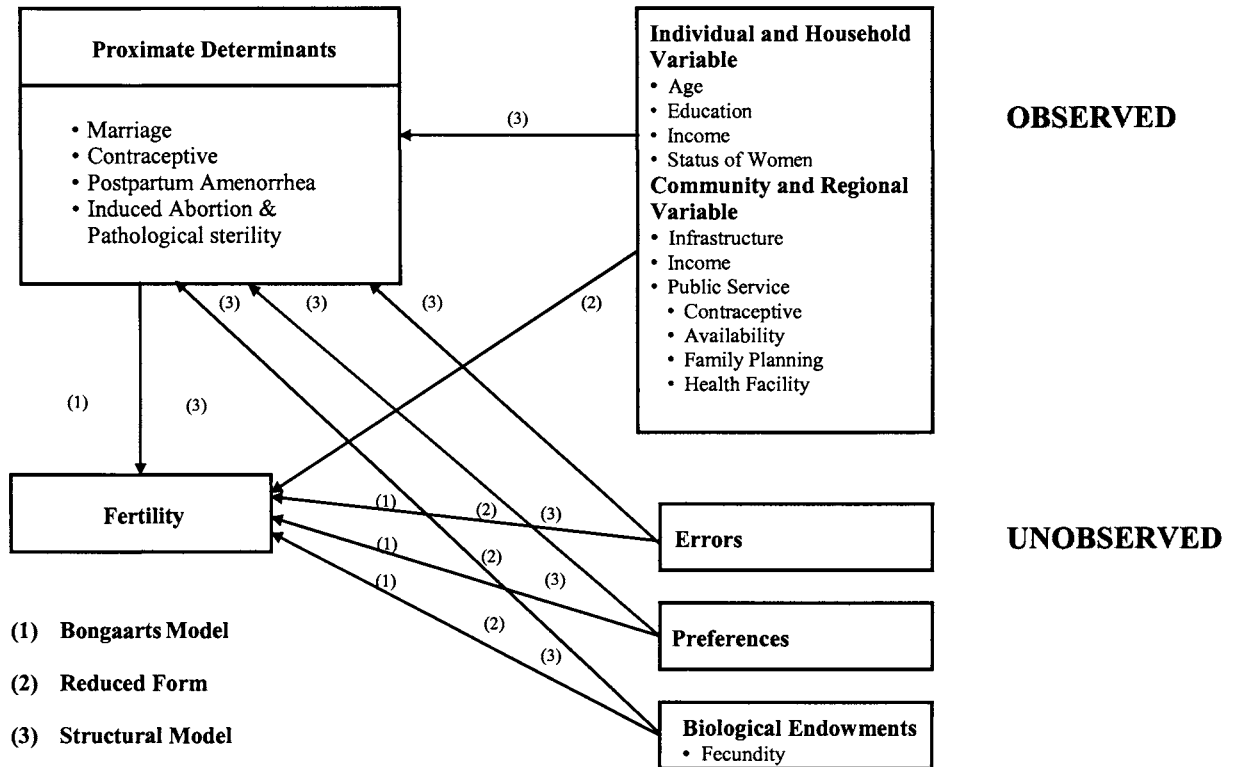
6.9 **Economists have mainly focused on the indirect (or *intermediate*) determinants.** These include variables such as education, income, child mortality, culture,<sup>54</sup> and the empowerment status of women, and are applied based on welfare maximizing models. The exact channels through which these different variables affect fertility are not identified. To apply this reduced form approach, household data sets which contain both fertility and socio-economic variables are necessary and a series of econometric concerns need to be addressed.

6.10 **Both the Bongaarts model and reduced form estimates can be used to simulate the impact of changes in the underlying determinants on fertility rates and, thereby, on population growth.** Features from both approaches can be combined, in effect using a more structural approach, by supplementing the Bongaarts model with an econometric analysis of the relative effect of different socio-economic determinants on fertility behavior such as age at marriage, contraceptive use, and the duration of breastfeeding. The effect of socio-economic determinants on direct determinants (e.g. contraceptive use) is estimated econometrically. Subsequently, the effect of a change, for example, contraceptive use on the TFR, can be simulated using the Bongaarts equation. The flow diagram in Figure 6.4 illustrates how these standard relationships between fertility, the proximate determinants, and the intermediate determinants interact.

---

<sup>54</sup> Demographers, however, have recently stressed ideational changes (or changes in attitudes) as they may also induce couples to have less children (see Cleland and Wilson, 1987).

Figure 6.4: Proximate Determinants, Intermediate Determinants, and Fertility



Source: Adapted from Gertler and Molyneaux, 1994.

### 6.3 Structural Analysis of the Determinants of Fertility

#### 6.3.1 Proximate Determinants of Fertility—the Bongaarts Model

6.11 The TFR can be modeled as the product of several indices summarizing the effects of the proximate determinants of fertility. Bongaarts (1978) established and then refined (Bongaarts et al., 1994) a relationship between the total fertility rate (TFR) and the total (or natural) fecundity through several indices reflecting the effects of the proximate determinants, as follows:

$$TFR = C_m * C_c * C_i * C_a * C_p * F_n$$

where  $C_m$  is the marriage indicator (or exposure to sexual union),  $C_c$  the contraception index (for both modern and traditional methods),  $C_i$  the postpartum infecundability index (a function of postpartum abstinence and the duration of breastfeeding),  $C_a$  the abortion index (generally induced abortion),  $C_p$  the pathological sterility index, and finally  $F_n$  expresses total (or natural) fecundity. The intuition behind this model is that each of these factors (expressed by the  $C$  indices) inhibits, or at least reduces the natural fecundity (natural fecundity is generally much higher than actual or “observed” fertility). Thus, each index  $C$  is defined to vary between 1

(maximum value) and 0 (minimum value). When the index value is 1, there is no inhibiting effect of this proximate determinant. However, if any one index is zero, the inhibiting effect of that proximate determinant is complete and the total fertility rate is therefore zero as well. When all indices equal one, fertility is at its biological maximum  $F_n$ . Given the multiplicative nature of this formula, the marginal effect of a decline in one of the indices critically depends on the size of the other indices.

6.12 **The index of marriage ( $C_m$ ) is approximated here by the proportion of women of reproductive age (15-49 years) who currently are in union (married or living together).** The index is 1 when all women of reproductive age are currently in union and zero when none of them are currently in union. It captures the risk of exposure to conception. In using the proportion of women of reproductive age currently in union, we implicitly assumed that only women in union are exposed to the risk of conception. This is very plausible in the Ethiopian context, where childbearing occurs almost exclusively within marriage (Sibanda et al., 2003).<sup>55,56</sup> In 2000, 62.8 percent of women of childbearing age (15-49) were currently married and 0.9 percent were living together. There has been little change over the past five years, with data from the DHS 2005 indicating similar figures of 63 percent and 1 percent, respectively (DHS 2005).

6.13 **We proxy the index  $C_c$  for contraception here by the proportion of couples currently using (either modern or traditional) contraception.** The index is 1 if no couple uses contraception and zero if all couples use it. The use of traditional contraceptives in Ethiopia is only a small fraction of the total use of contraceptives which is low itself (estimated at 14.7 percent among currently married women in 2005, compared to 8.1 percent in 2000) (DHS 2000 and 2005). Furthermore, given that the effectiveness in reducing exposure to child birth differs across various contraceptives, the index is adjusted to account for the country-specific contraceptive method-mix observed.

6.14 **Postpartum infecundability ( $C_i$ ), abortion index ( $C_a$ ) and pathological sterility ( $C_p$ ) are the remaining indices in the model.** The index of postpartum infecundability,  $C_i$ , equals 1 in the absence of breastfeeding and postpartum abstinence, and zero when infecundability is permanent.  $C_a$ , the index of abortion, is 1 if there is no abortion and zero if there is universal induced abortion. It is obtained as a function of the total abortion rate.<sup>57</sup> The specific total abortion rate is often difficult to observe in developing countries and is usually approximated by figures from other countries. The index  $C_p$  estimates the fertility-inhibiting effects of primary and secondary sterility due to disease.

---

<sup>55</sup> This pattern holds in Addis Ababa, contrary to reports of rising premarital fertility that may accompany changes in marriage patterns elsewhere in sub-Saharan Africa (Lindstrom and Woubalem, 2003). Lindstrom and Woubalem (2003) also note that the fertility rates of non-married women in Addis Ababa dropped sharply from 1984 (1.48 TFR) to 1994 (0.53 TFR).

<sup>56</sup> Alternatively, one could consider the proportion of sexually active women including those who are sexually active but not in cohabitation or union, or include those who are sexually active but not in cohabitation or union, but at a reduced risk of conception (i.e. weight them by half).

<sup>57</sup> POLICY Project (1997).

6.15 **The total fertility rate can be expected to go down when the marriage level goes down (less exposure to union), and levels of breastfeeding, abortion, postpartum infecundability, contraceptive use, and pathological sterility increase** (more fertility-inhibiting effects coming into play). In countries like Ethiopia, where marriage is the norm for a majority of the population, the use of contraception and recourse to abortion are low, the greatest fertility-inhibiting factor is postpartum infecundability which is mostly linked to long periods of postpartum abstinence and breastfeeding. Nevertheless, as the various proximate determinants change over time, the TFR in Ethiopia is projected to be affected by these changes.

6.16 **To explore the relative role of different proximate determinants on the TFR, an application of the Bongaarts model to Ethiopia is presented here on the basis of an analysis of the Demographic and Health Survey 2000 and 2005 data.** The computed index for each component is presented in Table 6.3. Using these indices and the observed TFR, the model estimates a total fecundity ( $F_n$ ) of 20.5 children per woman in 2000 and 20.08 in 2005.<sup>58</sup> This level of natural fecundity means that if there were no fertility limiting factors (assuming that all the  $C$  indexes would be 1), the TFR would be about 20. In other words, the maximum hypothetical fertility level in Ethiopia is around 20 children per woman. This corresponds to the average biological fecundity observed in other developing countries among women 15-49 year old.

**Table 6.3: Proximate Determinants of TFRs in Ethiopia and Estimated Total Fecundity, 2000 and 2005**

Year	2000	2005
<i>Observed Total Fertility Rate (TFR)</i>	5.9	5.7
Index		
Marriage	0.637	0.645
Contraception	0.930	0.874
Postpartum Infecundability	0.526	0.549
Pathological Sterility	0.990	0.990
Abortion	0.932	0.926
<i>Estimated Total Fecundity</i>	20.5	20.08

Source: DHS 2000 and 2005 and authors' calculations.

6.17 **Early age at marriage and first birth as well as extremely low use of contraceptives are the key behavioral factors contributing to high fertility levels.** The DHS 2005 shows that among women of childbearing age (15-49), 64.5 percent were currently married and/or living together (1.1 percent), 25.0 percent were never married, 6.6 percent were divorced/separated, and 4.0 percent were widowed.<sup>59</sup> In 2000, the marriage index ( $C_m$ ) was estimated at 0.637. This ratio is relatively high, due to early age at marriage, a factor which will be discussed below. In 2005 the contraceptive prevalence rate in Ethiopia for both traditional and modern methods among women in union was 14.7 percent, up from 8.1 percent in 2000,

<sup>58</sup> In effect, a slightly modified version by Stover (1998) of the model was used. Based on studies of historical and contemporary populations with the highest recorded fertility levels, Bongaarts sets by default  $F_n$  or the maximum number of births as 15.3 (this considers only women 15-45 years old as opposed to women 15-49 years old in our current application).

<sup>59</sup> The total does not add up to 100.0 percent because of rounding errors.

yielding an overall contraception index ( $C_c$ ) of 0.874 in 2005 and 0.930 in 2000 (which incorporates both the prevalence rate and the effectiveness of methods). Although the  $C_c$  index decreased to 0.874 in 2005, the scope for reducing fertility through increased contraceptive use is clearly enormous.

6.18 **The mean length of postpartum infecundability was estimated in 2000 at 19.5 months; the  $C_i$  index, another important fertility inhibiting factor, can therefore be estimated at 0.526 in 2000.** The level of  $C_i$  is related to the long duration of breastfeeding (on average estimated at 24.9 months in 2000). Postpartum infecundability decreased to 17.9 months in 2005, which translates into an index of 0.549 in 2005. The abortion index ( $C_a$ ) is estimated at 0.932 and 0.926 in 2000 and 2005, respectively. The latter are proxies based on international evidence. The pathological sterility index ( $C_p$ ) is derived from observed fertility patterns among 45-49 year old women. When the proportion of women between 45-49 old without children is below three percent, the  $C_p$  index is equal to 1. Anything above that translates into a  $C_p$  index below 1. The pathological sterility index  $C_p$  is estimated at 0.990 in 2000 and 2005.

### 6.3.2 *What Has Driven Fertility Changes Over the Past Decade?*

6.19 **The change in TFR can be attributed to changes in the proximate determinants, thus allowing the identification of the relative role of each factor.** To better understand these differences in levels and trends in fertility, the evolution of the different proximate determinants for Addis Ababa, other urban areas, and rural areas between 1990 and 2000 is presented in Table 6.4. The lower share of women at childbearing age in union and the somewhat higher contraceptive use (about 30 percent) in Addis Ababa when compared with the rural areas stand out, even though postpartum infecundability is somewhat lower in Addis Ababa, consistent with the shorter duration of breastfeeding (18.2 months on average versus 25.7 in rural areas). This is discussed in more detail below.

**Table 6.4: Indices of Proximate Determinants of TFRs by Residence, 1990-2000**

	Addis Ababa		Other urban areas		Rural areas	
	1990	2000	1990	2000	1990	2000
Index						
Marriage	0.54	0.35	0.66	0.52	0.81	0.74
Contraception	0.70	0.55	0.82	0.68	0.98	0.96
Postpartum infecundability	0.59	0.66	0.55	0.64	0.57	0.53
Pathological sterility	0.95	0.97	0.98	1.01	1.01	1.01
<i>Assumed</i> Total Fecundity	15.3	15.3	15.3	15.3	15.3	15.3
Predicted TFR	3.24	1.89	4.46	3.5	6.00	5.82
Observed TFR (unadjusted)	3.08	1.94	4.41	3.8	7.5	6.46

Source: Sibanda et al. (2003).

6.20 **The rapid decline in the proportion of women married has been the main driver of the fertility decline, especially in Addis Ababa.** Table 6.5 displays the relative contribution of these different determinants to the change in fertility. In Addis Ababa, more than 80 percent (35/42) of the decline in fertility between 1990 and 2000 can be attributed to the decline in the proportion of women in union. Three factors could underpin this rapid decline: 1) an increase in the mean age at marriage (i.e. reduction of early marriage); 2) an increase in the proportion of women who never marry; and 3) an increase in the dissolution of marriages. Sibanda et al.

(2003) found that the first two factors are mainly driving this recent evolution—later age at first marriage and more women in their 20s and 30s remaining single, while the dissolution of marriages had not fundamentally changed. Moreover, these researchers also found that the rise in non-marriage is not accompanied by an increase of births out of wedlock as might be expected. Social sanctions, economic costs, and increased use of contraceptive and/or abortion kept non-marital fertility low in Addis Ababa.

**6.21 Housing costs, lack of employment opportunities, increased levels of education and female participation in the labor force in urban areas all contributed to the delay in marriage.** Sibanda et al. (2003) further hypothesized that a severe housing shortage, related to the uncertainty about urban land tenure and urban land property rights, as well as the increase in urban unemployment (from 10.5 to 38 percent in Addis Ababa and from 8.8 to 20.3 percent in other urban areas) are underpinning the delays in marriage and the increase in non-marriage. A similar argument was made by Kinfu (2000). Malthusian forces would thus appear to induce people in urban Ethiopia to substantially reduce fertility. Yet, increased levels of education and female participation in the labor force in urban areas have likely also contributed. Women in Addis Ababa have higher education levels and the proportion of literate women among those of reproductive age increased from 29 percent in 1967 to 85 percent in 1994, while 45 percent of these women had nine or more years of education. Higher education levels are associated with later marriage. Participation of women in the labor force is a third factor: the proportion of employed women aged 25-29 increased from 37 percent in 1978 to 66 percent in 1994. This increase would have contributed to fertility decline through the opportunity cost of childbearing. It is impossible to quantify the relative importance of these factors on changing marriage patterns in Addis Ababa. Still, female education is important in determining age at marriage (as well as contraceptive use) as discussed further below.

**Table 6.5: Relative Contribution of Different Proximate Determinants to the Decline in Fertility by Residence in Ethiopia, 1990-2000**

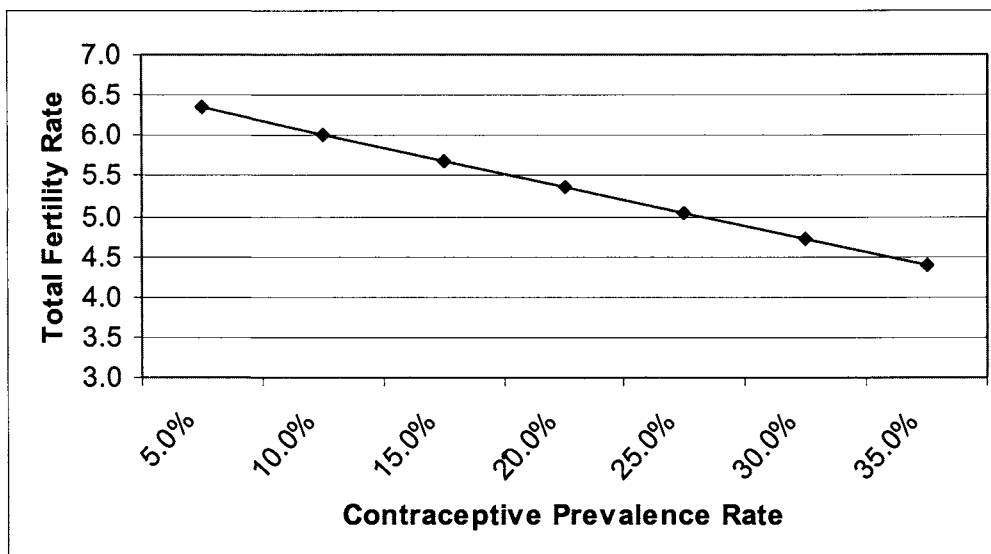
	Addis Ababa	Other urban areas	Rural areas
Index			
Marriage	-0.35	-0.21	-0.09
Contraception	-0.21	-0.17	-0.02
Postpartum infecundability	0.12	0.16	-0.07
Pathological sterility	0.02	0.03	0.00
Proportional change in TFR between 1990-2000	-0.42	-0.19	-0.18

*Source:* Sibanda et al. (2003).

**6.22 The rise in contraceptive use was important in Addis Ababa and in other urban areas, in explaining the decline in fertility, but does not appear to explain the modest decline in rural fertility** (Table 6.5). For example, contraceptive prevalence rates in Addis Ababa increased substantially from about 30 percent in 1990 to 45.2 percent in 2000. The decline in urban fertility was partially offset by the increase in the duration of postpartum infecundability, following a decline in the duration of breastfeeding and an increase in postpartum abstinence. On the other hand, postpartum infecundability increased in rural areas, an important factor in its (modest) fertility reduction.



**Figure 6.5: Total Fertility Rate Responses to Contraceptive Use, Holding other Factors Unchanged**



Source: Simulations based on the Bongaarts model for Ethiopia

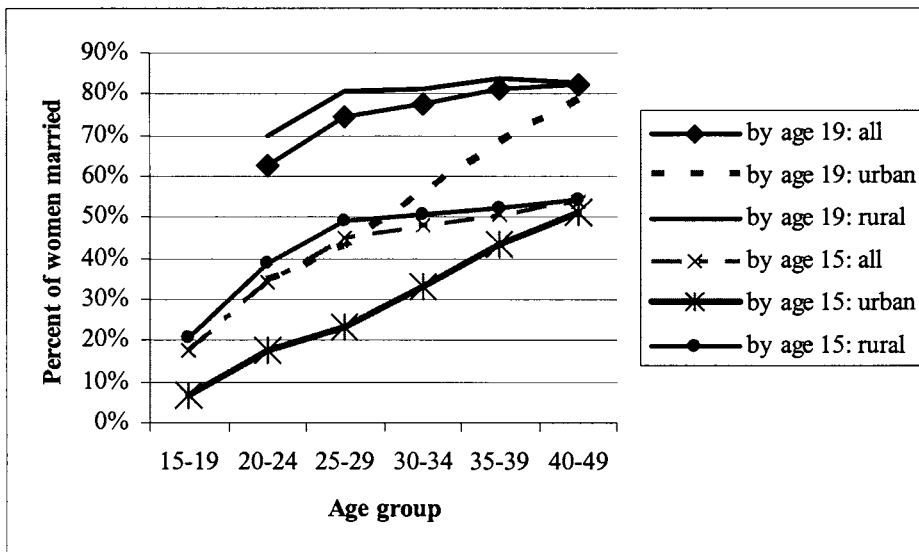
**6.23 A one percentage point increase in the use of contraceptives would reduce TFR by 0.06, when holding the other indicators constant.** This is illustrated in Figure 6.5 which shows the fertility projections associated with changes in contraceptive use, based on the Bongaarts model. Doubling the use of contraceptives from 8.1 percent among women currently in union in 2000 to 16.2 percent, would reduce the TFR from 5.9 to 5.3. Tripling contraceptive use would be associated with a TFR of 4.8. The level of the contraceptive use associated with a TFR of 4.0 (given current proportions of people in union) is more than 40 percent. By comparison, if the proportion of married women aged 15-49 declines by 10 percentage points (from 64 to 54 percent) the TFR would decrease to 4.9.

### **6.3.3 Determinants of Being in Union**

**6.24 While there has been an increase in the median age at marriage, early childbearing is still common.** There has been an overall decline in marriage for all ages in the last decade from 72 percent in 1990 to 64 percent in 2000 (DHS 2000), with the figure remaining at roughly 64 percent for 2005 (DHS 2005). Particularly, there has been a decline in the percentage of women married by age 15 (Figure 6.6). By area, Addis Ababa continues to have the lowest rates of marriage among women of all age groups (Table 6.6). The percent of women 20-24 years in Addis Ababa who are married by age 17 is 13.3 percent compared with 34.3 percent in other urban areas and 55.2 percent in rural areas. There is considerable variation in marriage patterns by region, even among mainly rural regions. Amhara has the highest rate of marriage by age 17 for those 20-24 years (74.4 percent of women) compared to much lower rates in SNNPR (36.6 percent), Harari (33.4 percent), and Dire Dawa (32.0 percent). As marriage has declined, the median age at marriage has increased, which in turn has led to an increase in the median age at first birth. Figure 6.7 shows the profile of children born by age category and age at marriage; Table 6.6 summarizes these results of cumulative fertility for women married before age 17 and for those married at age 17 or older. For all age groups, women who married

younger have significantly more children. Nonetheless, despite the changes in marriage patterns, early childbearing is still prevalent. About 16 percent of Ethiopian women aged 15-19 are either already mothers or are currently pregnant.

**Figure 6.6: Marriage Rates by 15 and 19 years, by Age Group and Residence**



Source: DHS 2005.

**Figure 6.7: Cumulative Fertility by Age at Marriage and Age Cohort**



Source: DHS 2005.

**Table 6.6: Marriage, Location, and Cumulative Fertility**

	<i>Age group</i>				
	20-24	25-29	30-34	35-39	40-49
<b><i>Married by age 17</i></b>					
By location					
Addis Ababa	13.3%	14.3%	25.8%	37.6%	58.8%
Other urban areas	34.3%	38.2%	51.3%	65.7%	72.3%
Rural areas	55.2%	67.9%	67.5%	69.1%	70.1%
By region					
Tigray	58.7%	64.7%	70.4%	79.0%	79.4%
Afar	59.9%	65.0%	63.3%	68.5%	56.9%
Amhara	74.4%	82.1%	83.4%	89.5%	87.1%
Oromiya	45.2%	58.9%	59.0%	60.6%	62.6%
Somali	58.0%	55.3%	57.7%	41.7%	39.9%
Benshangul/Gumuz	64.3%	74.8%	76.4%	79.4%	84.2%
SNNPR	36.6%	56.5%	58.6%	58.6%	62.2%
Gambella	68.8%	71.7%	68.1%	62.9%	76.6%
Harari	33.4%	33.9%	48.4%	50.7%	50.5%
Addis Ababa	13.7%	14.6%	26.4%	37.3%	57.0%
Dire Dawa	32.0%	38.7%	53.5%	57.7%	60.8%
<b><i>Cumulative fertility by age at marriage</i></b>					
Age at marriage less than 17 years	2.1	3.7	5.1	6.3	7.3
Age at marriage 17 years or older	0.9	2.4	4.0	5.5	6.5
Differences in cumulative fertility	1.2	1.3	1.1	0.8	0.8

*Source:* DHS 2005.

**6.25 Education, culture, and residence affect age at marriage.** The median age at marriage among women between 20 and 49 with no education was 15.9 compared with 17.5 for women with some primary education (DHS 2005). Similarly, women in urban areas tend to marry later than women in rural areas (median age at marriage of 18.7 and 16.2, respectively). There is also a substantial difference among regions with the median age at marriage in Amhara estimated at only 14.7 compared with 17.8 in SNNPR (DHS 2005). Population density in the latter region is also substantially higher (193 rural inhabitants per arable km<sup>2</sup> on average compared with 380 rural inhabitants per arable km<sup>2</sup> in SNNPR). Hogan, Berhanu, and Hailemariam (1999) conjecture that the high population density has induced a delay in marriage as families are no longer able to provide their children with cultivable land. This has traditionally been a prerequisite of marriage—another example of a Malthusian-like response. To gauge the relative importance of these factors, we ran a regression of the probability of never being married and the age at marriage on education, religion, and place of residence, using the DHS 2000 data (Table 6.7). Unfortunately, we do not have information on women’s family background (such as parents’ income or education and community characteristics). Nonetheless, these regression results are informative and will help explore the effects of increased education

and urbanization on the proportion of women in union. The coefficients on the variables in Table 6.7 can be interpreted as the association of a one unit change of the covariate on the predicted age at marriage (columns 1-3) and probability of being married (columns 4-7).

**6.26 Women with some primary education were found to marry about half a year later than those without education, while women with post-primary education tend to postpone marriage by about 2.5 years on average** (Table 6.7, columns 1-3). These results hold after controlling for differences in religious preferences, cultural differences (as captured by the regional dummies), and cultural changes over time (as captured by the age category of the women). Orthodox women tend to marry slightly earlier than women of other religions.

**6.27 Education also affects the probability that a woman aged 15-29 is married.** We find that women 15-29 year old with some primary education are 20 percentage points less likely to ever be married, while those with more than primary education are 30 percentage points less likely to ever be married (Table 6.7, columns 4-6). These effects tend to be even larger in urban areas, though slightly smaller in rural areas. To translate the effect of female education into fertility rates, we also estimated the effect of education, age, religion, and place of residence on the likelihood of currently being married (Table 6.7, column 7). We find that the likelihood of women being married between the ages of 15 and 29 declines by 2.4 percentage points for each additional year of education. In other words, those with full primary education (eight years) are nowadays almost 20 percent less likely to be married, irrespective of their age, areas of residence, and religion.

**6.28 There are substantial regional differences in the age at marriage and probability of being married.** Women in Amhara tend to marry on average 1.5 years earlier than those in Tigray, who in turn tend to marry on average 0.7 years earlier than women in Oromiya, and 1.7 years earlier than women in SNNPR. The gap is largest with women in Dire Dawa who marry on average 2.2 years later than those in Tigray. These differences across regions have important implications for targeting information, education, and communication (IEC) campaigns. While the effect of urbanization on the age at marriage is positive, it is imprecisely estimated (after controlling for educational achievement and regional differences). Women aged 15-29 years in urban areas tend to be 9 percentage points less likely to ever be married. Those in rural areas are 16.5 percentage points more likely to be married.

Table 6.7: Marriage Determinants

	Age at marriage, among ever married			Probability of never being married			Probability of currently married
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	15-49	15-49	15-49	15-29	15-29	15-29	15-29
		Rural	Urban		Rural	Urban	
Age 15-19	-0.708*** [5.94]	-0.611*** [4.83]	-1.038** [2.61]				
Age 20-24	0.478*** [4.10]	0.571*** [4.67]	0.187 [0.48]	0.398*** [22.89]	0.360*** [19.15]	0.477*** [13.33]	0.415*** [22.26]
Age 25-29	0.801*** [6.73]	0.760*** [5.91]	1.157*** [3.56]	0.542*** [26.87]	0.485*** [24.50]	0.691*** [12.24]	0.557*** [28.84]
Age 30-34	0.154 [1.23]	0.187 [1.46]	0.174 [0.41]				
Age 35-39	0.250** [2.11]	0.237* [1.91]	0.456 [1.39]				
Women: some primary	0.493*** [3.33]	0.475*** [2.99]	0.551 [1.47]	-0.193*** [8.29]	-0.175*** [6.92]	-0.219*** [5.99]	
Women: more than primary	2.479*** [9.00]	2.532*** [4.79]	2.524*** [7.23]	-0.313*** [8.49]	-0.257*** [4.42]	-0.339*** [8.48]	
Women: years of education							-0.024*** [5.87]
Religion: Orthodox	-0.265 [1.58]	-0.166 [0.90]	-0.403 [1.01]	0.045 [1.34]	0.014 [0.44]	0.101 [1.10]	0.000 [0.00]
Religion: Muslim	0.057 [0.31]	0.155 [0.79]	-0.584 [1.29]	0.022 [0.64]	0.002 [0.05]	0.138* [1.79]	-0.003 [0.08]
Rural	0.201 [1.02]			0.090** [2.18]			0.165*** [3.85]
Afar	-0.249 [1.20]	-0.029 [0.13]	-0.888* [1.86]	0.032 [0.67]	0.035 [0.61]	-0.031 [0.50]	0.035 [0.72]
Amhara	-1.501*** [8.69]	-1.429*** [7.95]	-1.173*** [4.04]	0.076* [1.75]	0.104** [2.31]	-0.142** [1.98]	-0.017 [0.50]
Oromiya	0.722*** [4.11]	0.921*** [4.67]	0.072 [0.23]	-0.186*** [4.62]	-0.183*** [3.97]	-0.171** [2.42]	-0.088*** [2.58]
Somali	1.542*** [6.21]	1.912*** [7.66]	0.906*** [2.78]	-0.219*** [4.11]	-0.259*** [4.20]	-0.181** [2.40]	-0.077* [1.84]
Benshangul/Gumuz	-0.051 [0.19]	0.217 [0.74]	-1.319*** [4.43]	-0.054 [0.91]	-0.072 [1.13]	0.043 [0.47]	0.007 [0.14]
SNNPR	1.741*** [7.94]	2.068*** [9.36]	-0.167 [0.28]	-0.291*** [6.59]	-0.312*** [6.25]	-0.125* [1.79]	-0.158*** [4.16]
Gambella	0.509* [1.69]	0.742* [1.89]	-0.147 [0.42]	0.150*** [2.93]	0.093 [1.46]	0.270*** [2.58]	0.152** [2.47]
Harari	0.774*** [2.97]	0.818*** [3.36]	0.433 [1.07]	-0.141*** [3.02]	-0.110* [1.82]	-0.161*** [2.79]	-0.062 [1.49]
Addis Ababa	1.321*** [4.74]	0.000 [0.00]	0.719*** [2.90]	-0.372*** [7.66]		-0.337*** [6.25]	-0.251*** [6.05]
Dire Dawa	2.256*** [8.26]	2.965*** [9.71]	1.585*** [4.68]	-0.290*** [5.95]	-0.328*** [5.12]	-0.249*** [4.67]	-0.150*** [3.56]

	Age at marriage, among ever married			Probability of never being married			Probability of currently married
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	15-49	15-49 Rural	15-49 Urban	15-29	15-29 Rural	15-29 Urban	15-29
% of women married				0.605	0.651	0.425	0.515
Mean age at marriage	15.9	15.7	16.6				
Observations	11,388	8,770	2,618	9,144	6,143	3,001	9,144
R-squared	0.23	0.25	0.17				

*Source:* Authors' calculations using DHS 2000 data. Robust t statistics in brackets. \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%. Columns 1-3: OLS; Columns 4-7: Probit marginal effects.

**6.29 Reduced exposure to conception through delayed and reduced marriage is expected to reduce the total fertility rate (TFR).** Using the Bongaarts model, we estimate that universal primary education reduces the proportion of women in union from 63.6 percent to about 53.1 percent in 2030 and this would in turn reduce the expected children per woman from 5.9 in 2000 to 4.9 in 2030 (Table 6.8). This simulation assumes that the contraceptive prevalence rates and the postpartum infecundability indices, as well as the other indices, retain their 2000 values.<sup>60</sup>

<sup>60</sup> Specifically, we simulate the effect of attaining universal primary education among all 15-19 year olds (i.e. completed Grade 4) by 2015, and quasi full primary education among all 15-19 year olds (i.e. completed Grade 8) and 50 percent of all 15-19 year olds with some secondary education by 2030 (consistent with World Bank 2005 Education report and MAMS projections, we take this to be the completion of the first cycle of primary education). As a result, and taking into account the cohort effects (and thus the lag in achieving adult education), the average years of education attained among the 15-29 year olds is expected to increase from less than two years in 2000 to slightly more than eight years by 2030. Taking the Medium Variant of the UN population projections, we further assumed the urban population to grow from slightly less than 15 percent in 2000 to almost 30 percent in 2030. Finally, holding marriage/patterns for the 30-49 year olds at current levels, we find that the envisioned increase in educational attainments among young adult women and the increasing urbanization would reduce the proportion of women in union from 63.6 percent to about 53.1 percent in 2030. This would in turn reduce the expected children per woman by one from 5.9 in 2000 to 4.9 in 2030.

**Table 6.8: Predicted Effect of Education and Urbanization on Marriage and Marriage on TFRs**

	2000	2005	2010	2015	2020	2025	2030
Average years of education (15-29 year olds)	1.73	2.27	3.22	4.44	5.72	6.94	8.06
Urbanization rate (%)	14.90	16.20	17.80	19.80	22.30	25.30	28.00
Proportion of women in union given increasing urbanization and educational achievements							
15-19	23.20	21.69	19.16	15.91	12.44	9.04	5.91
20-24	63.10	61.59	59.06	55.81	52.34	48.94	45.81
25-29	79.40	77.89	75.36	72.11	68.64	65.24	62.11
30-34	85.40	85.40	85.40	85.40	85.40	85.40	85.40
35-39	84.00	84.00	84.00	84.00	84.00	84.00	84.00
40-44	78.80	78.80	78.80	78.80	78.80	78.80	78.80
45-49	76.10	76.10	76.10	76.10	76.10	76.10	76.10
Total proportion of women in union	63.59	62.67	61.13	59.16	57.06	54.99	53.09
Predicted TFR using Bongaarts model	5.90	5.80	5.66	5.48	5.28	5.09	4.92

*Sources:* Authors' calculations using education levels in DHS 2000 and 2000 urbanization rates in United Nations (2006).

*Note:* In calculating TFR, we assumed 2000 level of other parameters (contraceptive use rate among women in union of 8.1 percent and postpartum infecundability of 19.5 months).

### 6.3.4 Determinants of Contraceptive Use

**6.30 Ethiopia has historically had a very low level of contraceptive use.** According to the first ever national survey on fertility and family planning in 1990, only four percent of the women in their reproductive ages were using any family planning method at that time (Central Statistical Authority, 1993). One major NPP objective was to achieve a TFR of 4.0 children per woman by 2015 by expanding access to family planning programs such that by 2015 contraceptive use would reach 44 percent (Transitional Government of Ethiopia, 1993; fertility goal reiterated and contraceptive goal increased in the PASDEP). By 2000, however, the contraceptive prevalence rate (CPR) for currently married women had increased to 8.1 percent (DHS 2000) of which 6.3 percent was modern methods and 1.8 percent traditional methods.<sup>61</sup> In 2005, it was estimated at 14.7 percent of which 13.9 percent were modern methods, more than twice the amount in 2000.

**6.31 The rate of decline in fertility is lower than might otherwise be predicted given the increase in contraceptive use.** In spite of increases in contraceptive use, the estimated TFR has only fallen 0.2 between the two DHS surveys (from 5.9 to 5.7). Note that this is close to what the Bongaarts model calculates, i.e. a TFR of 5.61. This is because the proportion of women in union increased slightly from 63.7 to 64.5<sup>62</sup> and mean postpartum insusceptibility decreased from 19.5 to 17.9 months following a decline in the duration of breastfeeding (DHS

<sup>61</sup> When considering all sexually active women (both married and unmarried), the CPR was estimated at 5.9 percent.

<sup>62</sup> While it is not clear whether this change is statistically significant, the increase is slightly unexpected given the observed increase in women's educational achievements and the ongoing urbanization.

2000 and 2005). Both factors erode some of the gains from increased contraceptive use. Given that the increase in CPR is very recent, while the TFR is based on a five year reference period, the slightly lower predicted TFR is quite plausible.

**6.32 The sustained annual increase in contraceptive use among currently married women of 1.32 percentage points, as experienced in Ethiopia, is substantial.** Reviewing the evolution of contraceptive use in a sample of sub-Saharan African countries (Appendix A; see also Guengant and May, 2006), the average annual percentage point change during the 1990s has been 0.9 percent with only Mozambique and Zambia having experienced changes of 3 and 2 percentage points. Concerted actions will be needed to accelerate and sustain increases in the CPR in Ethiopia, let alone reaching the goal of 44 percent CPR by 2015. From international experience, a sustained increase of 2 percentage points in CPR over a longer period is an upper bound, achieved only in very few countries.

**6.33 Regional variation in CPR is large.** According to the results of the DHS 2005, the use of *modern* contraceptives is 45 percent in Addis Ababa and only 3 percent in the Somali Region. The three most populous regions, namely Amhara, Oromiya, and Southern Nations, Nationalities, and People's Region (SNNPR), which constitute over 70 percent of the country's population, have modern contraceptive prevalence rates of 15.7, 12.9, and 11.4 percent, respectively.

**6.34 While CPR among married urban women is 47 percent, it is only 11 percent in rural areas. There are also significant poor/rich differences in contraceptive use.** The DHS 2005 shows enormous differentials between the rich and poor, with 37 percent of rich women and only 4 percent of poor women using any method of contraception.

**6.35 DHS 2005 results show that the most commonly used modern methods are injectable contraceptives (10 percent) and the pill (3 percent).** Other modern methods are used much less: condoms (0.2 percent), female sterilization (0.1 percent), IUD (0.2 percent),<sup>63</sup> and any traditional method (0.8 percent). Over 85 percent of contraceptive use was accounted for by injectable contraceptives and pills which are both much more effective than condoms and traditional methods. The effectiveness factor of the current method-mix increased from 0.86 in 2000 to 0.96 in 2005. The low rate of sterilization usage is consistent with other sub-Saharan African countries.

**6.36 Use of long-term methods is hindered by several factors.** For example, an assessment of the reasons for the low use of IUDs in Ethiopia concluded that inadequate information about the method, lack of access, and unfounded rumors about the possible side effects of the method were the most important barriers to use.<sup>64</sup>

**6.37 Despite the increase in contraceptive use, Ethiopia still has substantial unmet demand for contraceptive use and thus potential for higher CPR.** "Unmet need" is the gap between the total demand (revealed and stated) and the use of contraception. In the DHS 2000, it

---

<sup>63</sup> On the low rate of utilization of IUDs, see Pathfinder International Ethiopia (2003).

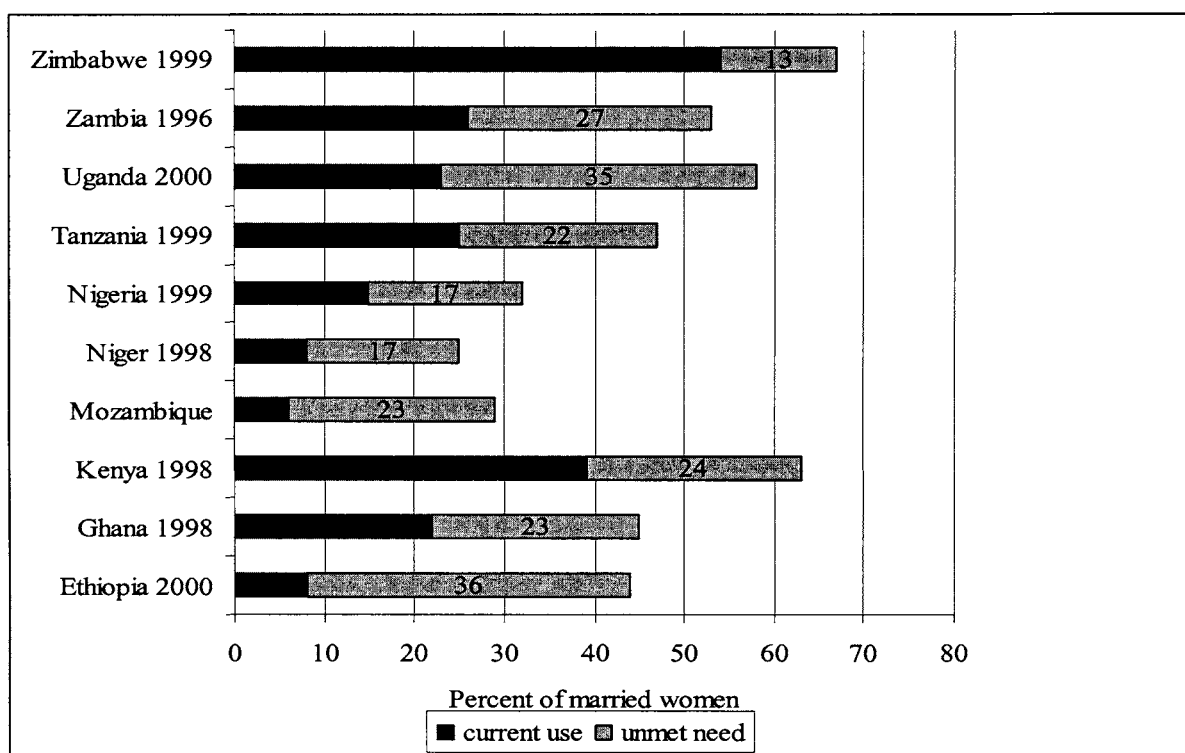
<sup>64</sup> Pathfinder International Ethiopia (2003).



stood at 36 percent (22 percent and 14 percent for spacing and limiting, respectively).<sup>65</sup> Figure 6.8 shows the levels in the contraceptive prevalence rate and unmet need in selected sub-Saharan countries, which together determine the total (i.e. revealed and stated) demand for contraceptives. Based on the DHS 2000 numbers, Ethiopia has among the lowest contraceptive prevalence rates and among the largest unmet need. Given that the CPR only increased from 8.1 to 14.7, most of this stated demand must have gone unmet. In 2005, unmet demand was estimated at 34 percent (DHS 2005). This suggests an increasing demand for contraceptives which has largely gone unmet. Figure 6.9 shows how many women have an “unmet” need for contraceptives and the processes by which this indicator is calculated.

6.38 **Unmet need is largest in rural areas and among uneducated and poor women.** Large variations between regions also exist with unmet need as high as 41.4 percent in Oromiya, 37.4 percent in SNNPR, and 30.0 percent in Amhara.

Figure 6.8: Contraceptive Prevalence and Unmet Needs in Selected Sub-Saharan Countries

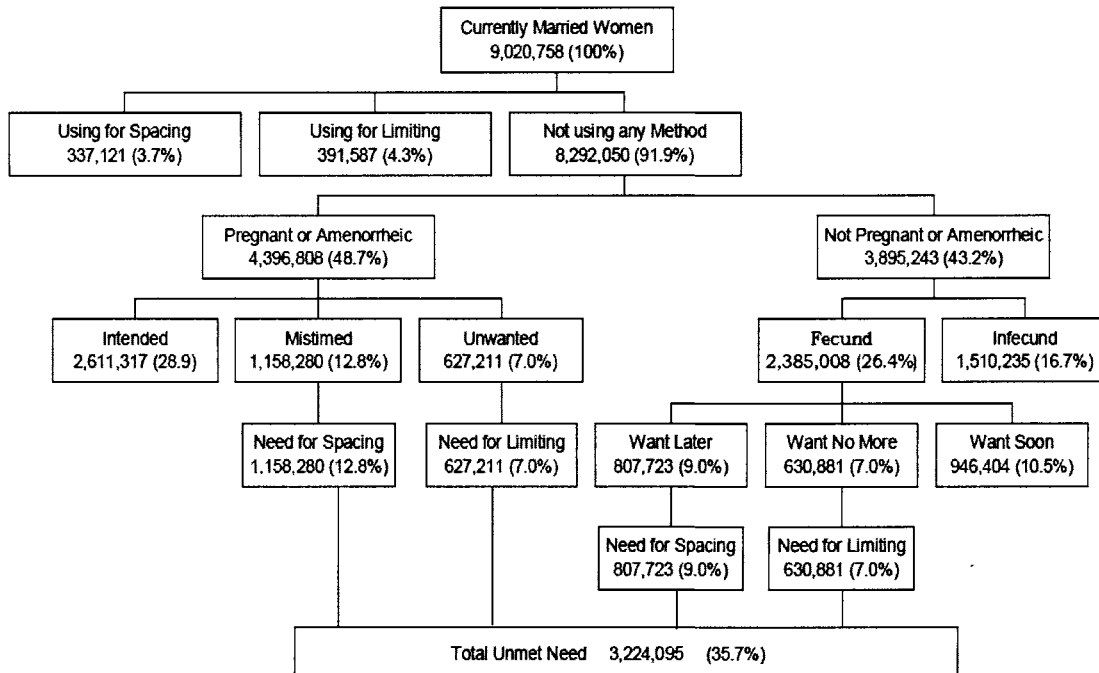


Source: Ashford (2003).

6.39 **However, unmet need may not equal the actual extent of contraceptive use should access to family planning be expanded.** Korra (2002), for example, included women who disapproved of family planning among those who had an unmet need and the same was the case if the husband disapproved of family planning. These two groups are unlikely to use contraceptives at all even if readily available.

<sup>65</sup> Korra (2002).

**Figure 6.9: Unmet Needs for Contraception in Ethiopia**



Source: Ahmed and Mengistu (2002), using DHS 2000 data.

6.40 **While there is an unmet need for FP, many women still opt not to use contraceptives.** Among the reasons for not using contraceptives, 12.5 percent of women mention lack of knowledge about methods, while 16.7 percent mention lack of knowledge about a source of contraceptives.<sup>66</sup> A relatively large number of women mention health concerns (including possible side effects) among the reasons for not using contraceptives. This is clearly one area where more information would be beneficial. Nonuse often also results from fertility-related reasons, which includes everything such as not having sex, the desire to become pregnant, and breastfeeding.

6.41 **Current contraceptive use can be modeled as a function of several characteristics of women and their communities.** To gauge which policies are currently more promising in fostering contraceptive use in Ethiopia, we estimate the relative importance of the different determinants of contraceptive use by applying multivariate analysis to the DHS 2000 data. An important factor in influencing contraceptive use is the presence of family planning programs and availability of services. Yet, such information is not available in the DHS 2000. A detailed description of the different variables used in the regression analysis, their average values, and distribution across the sample, is presented in Appendix B. Where appropriate, we will describe a particular variable in more detail below. The regression results are presented in Table 6.9. We run separate regressions for the rural and the urban sample to capture potential

<sup>66</sup> Note that more than one response is possible, meaning that the total percentage which do not use contraceptive because of lack of knowledge is at most 29.2 percent but possibly lower.

differential effects in these different settings, both in terms of attitudes towards contraceptive use and supply of contraceptives.

**Table 6.9: Correlates of Current Contraceptive Use, Women 15-49**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	15-49 years	15-49 years	15-49 years	15-49 years	15-29 years	Rural 15-49 years	Urban 15-49 years
Age 15-19	0.021** *	0.023** *	0.044** *	-0.042***		0.025** *	0.180** *
	[3.52]	[3.75]	[6.95]	[6.67]		[5.20]	[4.80]
Age 20-24	-0.001	-0.003	-0.011*	-0.008	0.048** *	0.014** *	0.025
	[0.16]	[0.53]	[1.83]	[1.42]	[5.69]	[3.10]	[0.75]
Age 25-29	0.007	0.005	0.007	0.009	0.078** *	0.004	0.045
	[1.39]	[0.98]	[1.15]	[1.52]	[8.55]	[0.73]	[1.35]
Age 30-34	0.006	0.005	0.011*	0.013*		0.001	0.113** *
	[1.10]	[0.97]	[1.67]	[1.93]		[0.20]	[3.08]
Age 35-39	0.015** *	0.014**	0.023** *	0.024***		0.005	0.174** *
	[2.73]	[2.50]	[3.40]	[3.57]		[0.91]	[6.10]
Log [household consumption]	0.000	-0.004	0.009	0.007	0.024** *	0.000	0.048**
	[0.06]	[0.72]	[1.41]	[1.07]	[3.32]	[0.05]	[2.10]
Women: some primary education	0.031** *	0.023** *	0.037** *			0.029** *	0.052*
	[5.47]	[3.87]	[5.35]			[4.65]	[1.84]
Women: more than primary education	0.058** *	0.040** *	0.053** *			0.084** *	0.081** *
	[5.89]	[4.22]	[5.49]			[4.40]	[3.28]
Years of education				0.004***	0.003** *		
				[5.91]	[4.14]		
Religion: Orthodox	0.008	0.010*	0.010*	0.012*	0.011	0.003	0.068**
	[1.61]	[1.85]	[1.65]	[1.77]	[1.63]	[0.44]	[2.14]
Religion: Muslim	0.005	0.008	0.008	0.01	0.001	0.002	0.062
	[0.79]	[1.13]	[0.97]	[1.08]	[0.16]	[0.33]	[1.13]
Currently married	0.049** *	0.039** *					
	[9.78]	[7.04]					

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	15-49 years	15-49 years	15-49 years	15-49 years	15-29 years	Rural 15-49 years	Urban 15-49 years
Husband has some primary education		0.010*					
		[1.96]					
Husband has some secondary education		0.044**					
		*					
		[5.40]					
Rural	-0.018	-0.014	-0.017	-0.016	-0.004		
	[1.50]	[1.21]	[1.36]	[1.28]	[0.44]		
<i>Community variables</i>							
% women with good source of water	0.018**	0.019**	0.021**	0.021**	0.014*	0.013	0.033
	[2.15]	[2.17]	[2.31]	[2.20]	[1.75]	[1.47]	[0.83]
Log [mean household consumption]	-0.013	-0.011	-	-0.030**	0.049**	-0.021	0.015
	[1.35]	[1.06]	[2.47]	[2.55]	[4.03]	[1.12]	[0.19]
Exposure of men to FP	0.006	0.007	0.009	0.009	0.001	0.007	-0.016
	[0.57]	[0.62]	[0.72]	[0.72]	[0.11]	[0.72]	[0.20]
Women's knowledge of FP	0.047**	0.048**	0.053**	0.056***	0.042**	0.037**	0.024
	*	*	*	*	*	*	*
	[4.90]	[4.72]	[4.50]	[4.66]	[3.86]	[3.99]	[0.37]
Mean years of female education	0.002	0.002	-0.001	-0.001	-0.001	0	-0.005
	[1.01]	[0.91]	[0.28]	[0.45]	[0.31]	[0.09]	[0.69]
Mean years of male education	0.002	0.001	0.004**	0.005**	0.004**	0.007**	0.006
	[1.11]	[0.63]	[2.20]	[2.29]	[2.01]	[2.78]	[0.87]
Child MR	0.001	0.004	0.009	0.001	0.024	0.027	0.170
	[0.04]	[0.10]	[0.20]	[0.03]	[0.50]	[0.74]	[0.63]
Women decide on money expenditures	0.026**	0.025*	0.02	0.02	0.030**	0.022	0.163**
	[2.01]	[1.86]	[1.26]	[1.26]	[1.97]	[1.55]	[2.08]
Women report that beating is justified	-0.008	-0.009	-0.015	-0.014	-0.012	-	0.069
	[0.59]	[0.63]	[0.89]	[0.81]	[0.63]	[2.16]	[0.99]
Proportion of women currently using	.060	.060	0.060	0.060	0.051	0.050	0.184
Observations	15,362	15,362	15,362	15,362	9,141	10,821	4,541

Sources: Authors' calculations using data from DHS 2000, Household Income, Consumption, and Expenditure Survey 1999/2000 (Central Statistical Authority, 2002), and Welfare Monitoring Survey 2000 (Central Statistical Authority, n.d.). Robust z statistics in brackets. \* Significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%. Regressions include controls for region. Probit marginal effects.

6.42 **Older, married, Orthodox women are more likely to use contraceptives.** Contraceptive use is smaller among women aged 15-19 years, while it is larger among those

aged 35-39 compared with those aged 40-49 (column 7). Moreover, currently married women are 4.9 percent more likely to use contraceptives. Being currently married may, however, be correlated with other unobserved preference variables introducing bias in our coefficients. To circumvent this, we present results without the marriage variable in columns (3-7). Orthodox women are also more likely to use contraceptives, though this seems largely an urban phenomenon (see columns 6 and 7 which report the rural and urban results separately), with urban Orthodox women being *ceteris paribus* 6.7 percent more likely to use contraceptives than other urban women from other religions.

**6.43 Education plays a critical role in fostering contraceptive use, starting with primary education.** Women with some primary education are on average 3.6 percent more likely to use contraceptives, while women with more than primary education are 5.4 percent more likely to use contraceptives. A similar result is obtained when using the number of years of education attained instead (each year of education is associated with a 0.4 percent higher likelihood of using contraceptives) (column 4). While the effect of secondary education is clearly stronger than the effect of primary education, it is important to note that in Ethiopia contraceptive use already increases with primary education (thereby exercising downward pressure on fertility, just as in the case of the likelihood of being married). Moreover, primary education appears to have a stronger effect in urban than in rural areas, which may be related to greater availability in urban areas which women with some education are more likely to take advantage of. Finally, women with better educated husbands also tend to be more likely to use contraceptives. Women in communities with a higher educated male population are also slightly more likely to be contraceptive users. We did, however, not find any additional (external) effects of the education level of other men in the community.

**6.44 Higher income is only associated with greater contraceptive use among the 15-29 year old women and in urban areas.** This may reflect pricing patterns of contraceptives as well as income constraints among younger women. Contraceptives could be more expensive in urban areas and younger women may be more cash-constrained.

**6.45 Empowerment of women, conditional on education, income, and other factors, may play an important role in CPR.** The empowerment status of women has often been identified in the literature as a key factor in determining contraceptive use.<sup>67</sup> We proxied the empowerment status of women in the community with two measures: (1) the likelihood of having cash at her disposal; and (2) women's attitudes toward wife beating. We take the community average for both the employment and attitude toward domestic violence variables (excluding the position of the women itself) to control for potential unobserved preferences of the women. For the same reason, we use (non-self) community averages for exposure to and knowledge of family planning (FP), child mortality, and having access to a good water source.

**6.46 Empowerment, as proxied by earning cash income over which one can decide, depends first on being employed, and then, on having the decision-making power over income from employment** (Table 6.10). About two thirds of all women were employed during the year preceding the DHS 2000 (including both agricultural and non-agricultural activities,

---

<sup>67</sup> Gertler and Molyneaux, 1994; Hogan, Berhanu, and Hailemariam, 1999; Eswaran, 2002.

though not domestic work). Yet, only 40 percent of those employed earned cash. The majority of those earning cash, 75 percent, or about only one in five women, were also able to decide on their own how to spend it. In rural areas, even fewer women are so empowered (less than one in six women), while in urban areas one in three women have cash earnings over which they can decide. Also noteworthy are large discrepancies between regions. In Tigray and Amhara, only one in nine women have cash to spend compared with one in six women in Oromiya and one in three women in SNNPR. A similar pattern across the main regions has been observed in the age at marriage, with girls in Tigray and Amhara tending to marry earlier than those in Oromiya and SNNPR. The likelihood of having cash to spend also increases by education, but is not affected by the age of the women, suggesting that generational effects do not affect this specific empowerment measure.

**6.47 In 2005, 81 percent of all women agreed that it was justified to be beaten by their husband for at least one of the following five reasons:** burning the food; arguing with her husband; going out without telling the husband; neglecting the children; and refusing sexual relations (DHS 2005). This is an indicator variable which takes the value of 1 if the woman agrees that it is justified to be beaten for at least one of these five reasons.

**Table 6.10: Employment, Cash Earnings, and Decision Power over Cash Earnings among Women of Childbearing Age in Ethiopia**

% of women 15-49 years	Employed in the 12 months preceding the survey	Earning cash when employed in 12 months preceding the survey	Deciding on use of cash when employed and earning cash in 12 months preceding the survey	% of women who have cash over which they decide
<b>Age</b>				
15-19	56	40	79	18
20-24	63	43	74	20
25-29	66	39	71	18
30-34	65	39	71	18
35-39	65	40	70	18
40-44	70	39	78	21
45-49	68	35	82	19
<b>Residence</b>				
Urban	56	78	76	33
Rural	65	32	74	15
<b>Region</b>				
Tigray	80	23	67	12
Amhara	76	25	56	11
Oromiya	57	36	80	16
SNNPR	60	63	82	31
Addis Ababa	50	95	81	38
<b>Education</b>				
No education	66	35	74	17
Primary	60	49	81	24
Secondary and higher	51	75	71	27
<b>Total</b>	<b>63</b>	<b>40</b>	<b>75</b>	<b>19</b>

Source: DHS 2000.

Note: Only 6.8 percent of the 63.3 percent of those employed in the 12 months preceding the survey were currently not employed; other regions have been left out due to small sample size.

6.48 **Employed women earning cash income over which they can decide are more likely to use contraceptives.** If all urban women were employed and earned cash over which they could decide, contraceptive use would be 16.3 percentage points higher than in communities where no women earned cash income. In rural areas, the difference is only estimated at 2 percentage points. Note that the major difference is that a large majority can decide on how to spend cash once it is earned, while only about 25 percent of all women actually earn cash. The critical importance of economic opportunities for women in determining contraceptive use has also been emphasized in other studies. For the substantial decline in TFR between 1982 and 1987 in Indonesia, Gertler and Molyneaux (1994) found that 75 percent of the decline in fertility could be ascribed to increased contraceptive use and that 20 percent (15.6/74.9) of the increase in contraceptive use followed from increased wages for women (13.7 percent was attributed to the increased wages for men). Similarly, female wages were found to affect contraceptive use in the Philippines (again after controlling for male wages) (Degraff, Bilborrow, and Guilkey, 1997). We also find that women's attitudes about wife beating are negatively correlated with contraceptive use, though only in rural areas.

6.49 **Contraceptive use is also associated with other community characteristics, including good water sources for households and knowledge levels.** Easier access to water might enhance women's employment opportunities and thus the chances of earning cash. Greater knowledge of family planning among women in the community is positively associated with an individual woman's contraceptive use. Child mortality rates were not found to affect contraceptive use, although the sample size may downwardly bias the estimated result.

6.50 **Bivariate analysis suggests that contraceptive use is larger (about 5 percentage points) in communities with access to family planning compared to those without.** To further gauge how family planning affects contraceptive use, we turn to the Pathfinder Survey 2004 and the Health Facility Survey (HFS) 2005 conducted by a World Bank team in the same Peasant Associations/*kebeles* (PAs/*kebeles*) covered by Pathfinder. Family planning (FP) in Ethiopia is typically linked to a health facility. More recently, the provision of FP services has been extended to community-based reproductive health agents (CBRHAs). Surveys provide a database on the availability of FP services and CBRHAs which, when combined with the Pathfinder Survey, allow us to explore the effect of FP on contraceptive use. The Pathfinder Survey 2004 covered 3,520 households spread across 176 PAs/*kebeles* in 58 *woredas* in 4 regions (Tigray, Amhara, Oromiya, and SNNPR). While all PAs/*kebeles* were covered in the HFS, the results in Table 6.11 are based on 109 PAs/*kebeles* only, due to some matching problems and missing variables. The coverage of health facilities across these PAs/*kebeles* expanded rapidly during the 1990s from 80 percent with no access to a health facility within 15 km of the village in 1992 to only 20 percent without a health facility in 2004. The CBRHAs program was introduced during the second half of the 1990s and its expansion is very recent (from none in 1992, to almost 50 percent coverage of the 109 PAs/*kebeles* in 2002 and about two thirds coverage in 2004). While most of the CBRHAs are active in PAs/*kebeles* with a health facility and family planning, about 10 percent of the sample PAs/*kebeles* reported to be covered by a CBRHA in the absence of a health facility/FP.

6.51 **The expansion of services is associated with increases in CPR among women in communities with services.** Between 1992 and 2004, Table 6.11 shows the prevalence levels for the sample of women in the Pathfinder Survey 2004 based on the availability of health and

FP services. The differences across categories are of more interest to us here than the actual levels due to sampling bias (see preceding paragraph). We find that women in PAs/*kebeles* with a health facility and FP services are about five to six percentage points more likely to currently use contraceptives. Length of exposure to the program does not appear to affect current use, and neither does the presence of a CBRHA. This is consistent with findings by Gertler and Molyneaux (1994) who also do not find an additional effect of FP field workers in Indonesia. Yet, the results by Degraff, Bilsborrow, and Guilkey (1997) for the Bicol region in the Philippines shows that outreach agents are more effective in fostering contraceptive use than the family planning clinics per se. Given that CBRHAs have only been introduced very recently in Ethiopia, it is probably too early to discern their effect on contraceptive use. In general, there is some ambiguity in the literature about the additional effect of outreach agents.

**Table 6.11: Current Contraceptive Use Rates in 2004 among Women 15-49 and Family Planning Availability in PAs/*kebeles***

	No Health Facility, No FP			Health Facility, FP		
	No CBRHA	CBRHA	Total	No CBRHA	CBRHA	Total
1992	20	0	20	26	0	26
1997	20	3	19	26	22	25
2002	13	21	15	24	25	25
2004	16	13	15	19	24	23
% Peasant Associations in each category (2004)	9.9	10.2	20	22.8	57.2	80

*Source:* Authors' calculations, World Bank Health Facility Survey (HFS) 2005 and the Pathfinder Survey 2004. These numbers are based on 109 of the 160 Peasant Associations (PAs/*kebeles*) covered in the Pathfinder Survey which covers four regions (Tigray, Amhara, Oromiya, and SNNPR). Fifty-one PAs were dropped due to problems matching the Pathfinder sample with the HFS. Prevalence rates are weighted.

**6.52 In sum, increasing contraceptive use is critical to initiate and accelerate the fertility transition and thus complete the demographic transition. However, it will require concerted efforts to rapidly expand FP provisions.** On the demand-side, increasing women's education and enhancing their employment opportunities are critical. Yet, these alone will not be enough, given the substantial lags (especially the education effect). These overall developments will need to be complemented by a substantial expansion in FP both to increase awareness and understanding as well as to provide timely and adequate supplies of contraceptives. That said, it must be underscored that FP alone is not a panacea either, as demonstrated by its estimated effects on contraceptive use.

**6.53 The Indonesian experience during the early 1980s provides useful insights into the role and necessity of widespread family planning services in Ethiopia, especially in the face of substantial unmet demand for contraceptives.** The findings from Gertler and Molyneaux (1994) in Indonesia, where a substantial drop in fertility was observed between 1982 and 1986, while both contraceptive use and economic development had expanded rapidly, are worth recalling. They concluded that while 75 percent of the decline in fertility was attributable to increases in contraceptive use, 87 percent of the increase in contraceptive use was due to changes in education and wages, such that the educational and economic impacts working strictly through increases in contraceptive use accounted for 65 percent of the fertility decline.



Family planning programs per se were responsible for only 4 to 8 percent of the decline. Yet, as the authors emphasize, the supply of family planning facilities and services was already widespread in Indonesia at the start of their study period, such that the supply in contraceptives could be easily ramped up to meet the rapidly increasing demand. In contrast, in Ethiopia, the increase in the demand for contraceptives substantially exceeds their current supply.

**6.54 We simulate the effects on fertility of an early accelerated expansion of contraceptive use among women in union (i.e. the currently observed 1.32 percentage point's annual increase until 2030) and one with a continued expansion at a slower rate, the average SSA rate of 0.9 percentage points per year.** Historically rapid expansion of contraceptive use has proven to be a challenge, and when it occurred it has usually coincided with concerted efforts on all fronts. For example, contraceptive use of modern methods among women in union went up from 17 percent in 1981 to 31 in 1991 in Peru (or about 1.4 percentage points per year) which coincided with a revival and more vigorous implementation of the population policy and a rapid expansion of supply outlets and family planning services since 1985 (health centers, pharmacies, dispensaries, and CBD promoters). By 1991, contraceptive users obtained almost half of their contraceptives at the pharmacy (Angeles, Guilkey, and Mroz, 2005a). Similarly, the recent observed increase in contraceptive use (all methods) among women in union of 1.32 percent per year in Ethiopia (from 8.1 to 14.7 percent between 2000 and 2005) has coincided with a rapid expansion of health facility and family planning services (including CBRHAs). In addition, the results of the increased investment in female education are also starting to increase contraceptive use as the first generation of girls benefiting from these efforts is reaching childbearing age. To sustain this accelerated annual increase of 1.32 percentage points, continued efforts in fostering female education, female empowerment, and participation in the workforce, as well as a continued expansion and increased effectiveness of FP services will be necessary. In the absence of such efforts, we assume a 0.9 percentage point annual increase, the SSA average during the 1990s (see Appendix A). This will provide a TFR equivalent closer to the High Variant population projection of the United Nations.

**6.55 An accelerated evolution of contraceptive use, combined with a decline in exposure to conception following increased female education and urbanization, is estimated to reduce the expected fertility from 5.9 in 2000 to 2.85 in 2030.** A more moderate (and perhaps more realistic) expansion of the CPR would reduce it to 3.49. This holds keeping the other factors constant. As the postpartum infecundity will likely decline (in 2005, postpartum infecundability was 17.9 months) following a decline in the duration of breastfeeding, TFRs are likely slightly higher in 2030 under both scenarios. For example, were postpartum infecundity to decline from 19.6 to 18 months, TFR under both scenarios would be 2.98 and 3.64, respectively, or a difference of about 0.7 (Table 6.12).

**Table 6.12: Simulations Based on the Structural Model**

	2000	2005	2010	2015	2020	2025	2030
<b>Scenario 1</b>							
% women in union assuming urbanization and universal primary education (Grade 4 by 2015 and 50% some secondary by 2030)	63.59	62.67	61.13	59.16	57.06	54.99	53.09
Annual CPR increase among women in union of 0.9% point per year	8.10	12.60	17.10	21.60	26.10	30.60	35.10
<b>Simulated TFR</b>	5.90	5.49	5.09	4.66	4.25	3.85	3.49
<b>Scenario 2</b>							
% women in union assuming urbanization and universal primary education (Grade 4 by 2015 and 50% some secondary by 2030)	63.59	62.67	61.13	59.16	57.06	54.99	53.09
Annual CPR increase among women in union of 1.32%/year	8.10	14.70	21.30	27.90	34.50	41.10	47.70
<b>Simulated TFR</b>	8.10	5.36	4.84	4.30	3.79	3.30	2.85

Source: Authors' calculations. See Table 6.8 for a more detailed description of the underlying assumptions.

## 6.4 Intermediate Determinants of Fertility

### 6.4.1 Socio-Economic Determinants of Fertility

6.56 **In this section, we model the relationship between fertility and socio-economic conditions and family planning services directly.** Tables 6.13, 6.14, and 6.15 present the results for total number of children and probability of a birth in the last three years for the sample of all women 15-49 years from the DHS 2000 for the pooled, the rural sample, and the urban sample, respectively.<sup>68</sup> As this is a reduced form model, it does not include the proximate determinants of fertility as regressors. Rather, the socio-economic variables are assumed to affect fertility through the proximate determinants (such as marital status, including age at marriage, and contraceptive use). As before, we use non-self community averages for a series of variables to control for unobserved heterogeneity which may bias the estimated coefficients on the other variables. We also explore the externality effects of education and income by including community averages for these variables. We predicted (log) consumption per adult equivalent to control for potential reverse causality. The results reported in Tables 6.13 to 6.15 do not control explicitly for the presence of family planning services, as we do not have data on this in the DHS 2000. To gauge the effect of family planning services within the Ethiopian context, we re-estimate the fertility regressions using the Pathfinder Survey data merged with the Health Facility Survey. The results are presented in Table 6.16.

6.57 **Not surprisingly, there are non-linearities in fertility with respect to women's age.** As women age, they have more children in total (Table 6.13, columns 1 and 2—the omitted category is the 40-49 year age group). Similarly, younger women are much more likely to have a birth in the last three years than older women (columns 3 and 4). The probability of having had

<sup>68</sup> Regressions for cumulative fertility (children born) are Ordinary Least Squares. Alternative specifications (e.g. Poisson) yield similar results.

a birth in the last three years is about 50 percentage points higher for women between the ages of 25 and 29 than for their counterparts 40 years and older.

**6.58 Household consumption (a proxy for wealth) is statistically associated with having fewer numbers of children (i.e. children ever born) and a lower probability of a recent birth.** The estimated effects are substantial, although the latter is not significant in column 3 which does not control for the woman's marital status. A doubling of the household's income is associated with a reduction in the number of children ever born in the range of 1-1.5 fewer children on average.

**6.59 Female education is strongly associated with fewer children in total (column 1) and a lower probability of a recent birth (column 3), and this partly operates through its effect on marital status; it further has substantial external effects.** The negative impact of female education on fertility is one of the most consistent findings in the literature on the intermediate determinants of fertility.<sup>69</sup> While women with at least some primary education have 0.2 less children (column 1), when we control for marital status (column 2), the association between education and total fertility is not statistically different from zero. We find the same pattern for recent fertility (any birth in the last three years). This indicates that the main effect of education on fertility operates through marital status. That is, once we control for a woman's marital status, we find that education is not associated with lower fertility. Finally, women who reside in communities with more educated women (irrespective of their own educational attainment) tend to have less children and are more likely to not have given birth in the past three years.

**6.60 Moreover, educational attainment starts to affect fertility from primary school onwards—women with some primary education having 0.2 less children on average, even though the effects are stronger for women with some secondary education.** Given the extremely low educational attainments of adult women in Ethiopia, this is an important and encouraging finding.

**6.61 To proxy the availability of family planning (FP) services, we also include knowledge of family planning among women in the community—which is associated with lower fertility.** Communities where 50 percent of all women know about FP have on average 0.6 children less than those where no women know about FP. On the other hand, men's exposure to FP is associated with greater fertility. However, this variable is difficult to interpret as it may reflect communities with higher fertility levels that are targeted with more frequent family planning campaigns. In other words, these measures do not control for placement effects.

**6.62 In at least one dimension, empowerment of women is associated with fewer children born.** Women earning cash income tend to have 0.3 less children. As done for the CPR results in the previous section, we use two measures of female empowerment constructed from the data: the percent of women in the community who report earning cash; and the percent of women who report that wife beating is justified. Greater female empowerment could result in lower fertility if the lack of empowerment results in women being unable to access family

---

<sup>69</sup> See, for example, the literature cited in Ainsworth, Beegle, and Nyamete (1996).

planning or otherwise attain their preferred family size. Although the coefficients are not always statistically significant, the direction of these covariates is in the expected direction, with greater decision-making being associated with lower fertility and more women condoning wife beating being associated with higher fertility.

6.63 **We do not find a (positive) effect of high child mortality on overall fertility.** High child mortality may result in higher family size if women anticipate high mortality rates for their children and want to ensure a desired number of children surviving until adulthood. It is problematic to include a woman's own measure of child mortality as it may be an endogenous measure, capturing other factors related to fertility rather than itself directly affecting fertility. As a proxy for a measure of a woman's child mortality rate, we have included a community measure constructed from the mortality rates experienced by neighbors of the woman. Generally, our measure of child mortality is not systematically associated with fertility rates of women. Bhargava (2005), using a different approach, also finds no statistical association between fertility intentions (as proxied by the reported desired number of children) and child mortality.

6.64 **As with the CPR, regional variation continues to be an important correlate of fertility.** Rural women have on average 0.4 more children than urban women and they are 8 to 10 percent more likely to have had a birth over the past three years. Women in SNNPR are also 8 percent less likely to have had birth over the past three years than those in Tigray. Further analysis by residence confirms that education of women, household income, and knowledge of family planning are generally significant factors influencing lower cumulative fertility among rural women (Table 6.14). The education level of women in the community also has a negative association with fertility. Among urban women, female education does not seem to have as strong a link to fertility across all age groups, although for the youngest cohort, the impact is large (Table 6.15).

**Table 6.13: Correlates of Fertility, Women 15-49**

	Children born		Any birth in last 3 years	
	(1)	(2)	(3)	(4)
Age 15-19	-6.665*** [69.75]	-5.713*** [53.84]	-0.216*** [9.54]	0.083*** [3.21]
Age 20-24	-5.534*** [58.02]	-5.162*** [56.30]	0.300*** [13.00]	0.467*** [20.17]
Age 25-29	-4.090*** [41.01]	-3.970*** [40.92]	0.469*** [21.58]	0.537*** [24.81]
Age 30-34	-2.322*** [23.90]	-2.309*** [24.22]	0.428*** [18.41]	0.438*** [19.28]
Age 35-39	-1.284*** [11.62]	-1.283*** [11.71]	0.319*** [13.13]	0.316*** [13.32]
Log [HH consumption]	-1.215*** [13.62]	-1.564*** [14.76]	-0.029 [1.17]	-0.221*** [8.77]
Woman: some primary education	-0.170*** [2.81]	-0.03 [0.54]	-0.057*** [3.25]	0.002 [0.13]
Woman: more than primary education	-0.201** [2.33]	0.095 [1.12]	-0.089*** [3.71]	0.048* [1.78]

	Children born		Any birth in last 3 years	
	(1)	(2)	(3)	(4)
Ever married		1.448*** [21.72]		0.510*** [24.30]
Religion: Orthodox	0.105 [1.33]	0.057 [0.76]	0.058*** [2.88]	0.041** [2.18]
Religion: Muslim	0.155 [1.62]	0.137 [1.54]	0.039* [1.87]	0.035* [1.78]
Rural	0.357** [2.28]	0.395** [2.48]	0.080** [2.10]	0.111*** [3.10]
<i>Community characteristics</i>				
% of women with good water source	-0.007 [0.04]	-0.034 [0.19]	0.060 [1.57]	0.038 [0.99]
Log [mean HH consumption]	0.112 [0.42]	0.411 [1.51]	-0.179*** [3.09]	-0.046 [0.83]
Exposure of men to FP	0.395** [2.49]	0.334** [2.20]	0.007 [0.18]	-0.009 [0.23]
Woman's knowledge of FP	-0.680*** [4.89]	-0.662*** [4.97]	-0.04 [1.01]	-0.034 [0.88]
Mean years of female education	-0.112*** [3.13]	-0.072** [2.16]	-0.049*** [5.11]	-0.029*** [3.07]
Mean years of male education	0.102*** [2.67]	0.080* [1.96]	0.018* [1.83]	0.007 [0.77]
Child mortality rate	0.065 [0.10]	-0.174 [0.27]	-0.164 [1.06]	-0.301** [2.16]
Woman earns cash	-0.572*** [2.65]	-0.408* [1.94]	-0.078 [1.58]	-0.007 [0.16]
Woman reports that wife beating is justified	-0.026 [0.11]	0.101 [0.40]	0.038 [0.62]	0.104* [1.68]
Mean number of births	3.092			
Mean probability of any birth in the last 3 years	0.418			
Observations	15,362	15,362	15,362	15,362
R-squared	0.68	0.70		

Source: Authors' calculations based on DHS 2000 data. Robust t statistics in brackets. \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%. Regressions include controls for region. Columns 1 and 2: OLS. Columns 3 and 4: Probit marginal effects.

**Table 6.14: Children Born, Rural Women 15-49**

	(1) 15-49	(2) 15-19	(3) 20-24	(4) 25-29	(5) 30-34	(6) 35-39	(7) 40-49
Log [HH consumption]	-1.650*** [14.58]	0.393*** [7.78]	0.665*** [5.16]	-1.315*** [3.70]	-4.161*** [10.96]	-4.701*** [7.44]	- [16.18]
Woman: some primary education	-0.144** [2.09]	-0.057** [2.54]	-0.076 [0.79]	0.078 [0.56]	-0.334 [1.56]	-1.148*** [3.24]	-0.008 [0.01]
Woman: more than primary education	-0.402** [2.25]	0.067 [0.53]	-0.414** [2.31]	-0.443 [1.57]	-0.319 [0.54]	-2.664*** [3.73]	- [15.70]
Religion: Orthodox	0.099 [1.22]	0.025 [0.75]	0.11 [0.99]	0.027 [0.14]	0.062 [0.28]	0.221 [0.95]	0.222 [0.88]
Religion: Muslim	0.084 [0.83]	-0.029 [0.82]	0.054 [0.45]	0 [0.00]	0.357 [1.57]	0.344 [1.26]	0.025 [0.09]
<i>Community characteristics</i>							
% of women with good water source	0.148 [0.76]	0.050 [0.72]	0.115 [0.65]	1.004*** [3.57]	0.335 [0.81]	-0.467 [0.86]	-0.462 [0.88]
Log [mean HH consumption]	0.106 [0.34]	-0.155 [0.89]	-0.61 [1.63]	-0.214 [0.31]	-0.358 [0.38]	1.412 [1.64]	0.752 [0.76]
Exposure of men to FP	0.477*** [2.83]	0.017 [0.27]	0.091 [0.45]	0.012 [0.04]	0.834** [2.36]	0.760* [1.72]	1.165** [2.45]
Women's knowledge of FP	-0.641*** [4.14]	-0.109* [1.68]	-0.321 [1.57]	-0.154 [0.52]	-0.993*** [3.28]	-0.083 [0.17]	1.582*** [3.28]
Mean years of female education	-0.232*** [3.26]	-0.011 [0.44]	-0.233*** [3.14]	-0.671*** [4.50]	-0.186 [1.26]	0.148 [0.68]	-0.16 [0.92]
Mean years of male education	0.173*** [3.38]	0.001 [0.05]	0.111 [1.64]	0.307*** [3.12]	0.231* [1.90]	-0.102 [0.59]	0.211 [1.43]
Child mortality rate	0.341 [0.49]	-0.035 [0.15]	1.458 [1.60]	-0.145 [0.15]	2.138 [1.44]	-1.49 [0.95]	1.384 [0.79]
Woman earns cash	-0.415* [1.74]	-0.240*** [3.42]	0.204 [0.72]	-0.211 [0.48]	-0.734 [1.26]	-0.792 [1.34]	-0.562 [0.82]
Woman reports that wife beating is justified	-0.299 [1.09]	0.079 [0.69]	0.032 [0.10]	-0.903* [1.82]	0.315 [0.63]	-0.327 [0.42]	-0.513 [0.58]
Mean number of births	3.348	0.177	1.315	2.901	4.834	5.891	7.188
Observations	10,821	2,376	1,923	1,843	1,415	1,308	1,956
R-squared	0.68	0.09	0.08	0.11	0.23	0.22	0.21

*Source:* Authors' calculations based on DHS 2000 data. Robust t statistics in brackets. \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%. Regressions include controls for region. Column 1 includes controls for age.

**Table 6.15: Children Born, Urban Women 15-49**

Variable	(1) 15-49	(2) 15-19	(3) 20-24	(4) 25-29	(5) 30-34	(6) 35-39	(7) 40-49
Log [HH consumption]	-0.619*** [7.94]	0.090** [2.31]	0.289* [1.96]	-0.376* [1.77]	-1.174*** [2.76]	-2.717*** [3.69]	-2.554*** [5.13]
Woman: some primary education	-0.148 [1.38]	-0.139*** [3.43]	0.243 [0.97]	0.260 [0.92]	-0.192 [0.63]	-0.058 [0.10]	0.188 [0.36]
Woman: more than primary education	-0.374*** [4.72]	-0.128*** [3.16]	-0.165 [1.46]	-0.506*** [2.78]	-0.27 [0.72]	-0.209 [0.53]	0.119 [0.32]
Religion: Orthodox	0.191 [1.29]	0.007 [0.31]	0.192 [1.10]	-0.547** [2.13]	1.665*** [3.80]	0.134 [0.21]	0.708 [1.15]
Religion: Muslim	0.525** [2.22]	0.047 [1.44]	0.753** [2.31]	-0.421 [1.21]	2.687*** [5.52]	-0.392 [0.57]	1.826* [1.90]
<i>Community characteristics</i>							
% of women with good water source	-0.343 [1.40]	-0.048 [0.64]	-0.031 [0.09]	-0.689** [2.28]	0.420 [0.62]	-1.462* [1.83]	-0.968* [1.67]
Log [mean HH consumption]	-0.568 [1.26]	-0.114 [1.60]	-0.794 [1.60]	-1.054** [2.01]	-0.467 [0.53]	1.000 [0.62]	-2.589* [1.76]
Exposure of men to FP	-0.256 [0.54]	-0.159* [1.69]	-1.185*** [3.36]	-0.246 [0.47]	1.596 [1.65]	0.721 [0.41]	-0.204 [0.21]
Women's knowledge of FP	-0.569 [1.46]	0.044 [0.49]	-0.047 [0.13]	0.004 [0.01]	-0.332 [0.33]	-0.144 [0.10]	-3.576*** [3.47]
Mean years of female education	-0.006 [0.19]	0.004 [0.51]	-0.02 [0.46]	-0.074 [0.87]	-0.143 [1.25]	-0.17 [1.31]	0.424** [2.31]
Mean years of male education	0.035 [0.99]	-0.01 [0.93]	0.079* [1.96]	0.016 [0.19]	0.027 [0.22]	0.119 [0.82]	0.181 [1.10]
Child mortality rate	-0.311 [0.27]	0.212 [0.71]	0.047 [0.03]	-3.462 [1.26]	-4.833 [1.33]	1.172 [0.23]	-4.332 [0.75]
Woman earns cash	0.006 [0.01]	0.145* [1.94]	0.800** [1.99]	-1.808** [2.35]	-1.476 [1.35]	-0.556 [0.36]	-0.053 [0.03]
Woman reports that wife beating is justified	0.264 [0.69]	-0.160** [2.05]	0.41 [0.85]	0.333 [0.69]	-0.678 [0.51]	-0.936 [0.62]	3.373** [2.34]
Mean number of births	1.934	0.071	0.722	1.614	3.156	4.497	5.550
Observations	4,541	1,205	921	873	487	453	602
R-squared	0.62	0.10	0.18	0.22	0.33	0.32	0.29

*Source:* Authors' calculations based on DHS 2000 data. Robust t statistics in brackets. \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%. Regressions include controls for region. Column 1 includes controls for age.

#### 6.4.2 Effectiveness of Family Planning in Reducing Fertility

6.65 **Providing family planning services has been found to reduce fertility, though there has been disagreement on the size of its effect.** Properly evaluating the effect of family planning is fraught with difficulties. When a Government is mainly interested in reducing fertility, it could, for example, place family planning programs in areas with the highest fertility, i.e. where it is most needed. In comparing areas with and without the program, the effect of the program on fertility may then be underestimated, as other characteristics of the environment, unobserved by the analyst, may also increase fertility, though they would be seen inadvertently as characteristics of the program, which is assumed to be the only difference between the two areas. This is commonly referred to as the *program placement bias*.<sup>70</sup>

6.66 **An additional difficulty is how to measure the effects of family planning programs which are multi-dimensional.** Most studies of family planning programs use simple measures of access such as the distance to a center providing family planning services. Ideally, access would be measured in more complicated ways to incorporate the many dimensions of family planning programs that affect contraception use, such as the method-mix available to women, the regularity of supplies (frequency of stock outages), the quality of staff at the health care provider (and absenteeism), the quality of the facility's infrastructure (cleanliness, etc.), and costs.

6.67 **Studies from across Asia, Latin America, and sub-Saharan Africa situate the effect of family planning programs on lifetime fertility between 0.5 and 1.5 children, with most studies suggesting an effect to the lower end of this range.** The effects differ depending on the length of exposure to the program and the intensity and implementation effectiveness of the program. Probably the best known example of a family planning program is the experiment in Matlab, Bangladesh. It began in 1978 and assigned about half of the villages to receive a very intensive family planning program, while the other half continued to be served by the standard Government family planning program. Fertility was estimated to be 24 percent lower in the villages that had received the intensive family planning program than in the other villages.<sup>71</sup> Others argued, however, that these results reflected a level of program intervention and intensity that is not sustainable.<sup>72</sup> The program was exceedingly expensive, almost 35 times the normal cost per woman reached of running a standard Government family planning program.<sup>73</sup> A more recent study of the Matlab family planning program suggests a decline in fertility of about 15 percent in the program villages compared with the control villages.<sup>74</sup> At about six children per woman on average, this results in a reduction of 0.9 children.

---

<sup>70</sup> A good illustration of these problems can be found in Pitt, Rosenzweig, and Gibbons (1993); they show that not taking account of the non-random placement of programs leads to substantial biases in the estimated program effects. See also Rosenzweig and Wolpin (1986).

<sup>71</sup> Phillips, Simmons, Koenig, and Chakraborty (1988).

<sup>72</sup> Pritchett (1994).

<sup>73</sup> Pritchett (1994) calculates that each averted birth cost US\$180 in 1987, equivalent to 120 percent of Bangladesh's GDP per capita at the time.

<sup>74</sup> Joshi and Schultz (2005).



6.68 Similarly, a study from Tanzania confirms that family planning programs reduce fertility and further indicates that the effect varies with the type of, and distance to, outlet and how old a woman was when the program was introduced. Using simulations, the study reports that a woman exposed to family planning would have 4.13 children instead of 4.71 children in the absence of family planning interventions. This result, however, masks differences between the different types of outlets: health centers are substantially more effective than hospital and dispensaries.<sup>75</sup> These findings correspond closely to those reported for PROFAMILIA of Colombia where exposure to family planning throughout the child-bearing age of a woman was estimated to reduce lifetime fertility on the order of half a child.<sup>76</sup> In particular, it appears to have led to a substantial postponement of first birth, which in turn has led to higher education for young women with important intergenerational cross-over effects in terms of child health and education. Nonetheless, despite the sharp decline in fertility in Colombia, only around 10 percent of the decline was explained by the family planning programs. In a more recent study from Peru, exposure to family planning programs throughout childbearing age was simulated to reduce the number of children born by 1.3 children for women with no education and by 0.93 for women with 10 years of education.<sup>77</sup> These results reinforce the critical importance of education. Women with no education are predicted to have 2.5 children more than those with 10 years of education in the absence of family planning and 1.18 children more when there is family planning. Family planning partially substitutes for lack of education.

6.69 **To evaluate the effectiveness of family planning in Ethiopia, we measure the effect of family planning on cumulative fertility (number of children ever born) using three data sets.** The first data set contains information on individual women from the Pathfinder Survey 2004 (see Appendix C). We focus on the number of children ever born. Information on family planning provision and the year of introduction to the community is drawn from a second data set collected by the World Bank in July 2005 specifically for this report. The survey was administered at the *woreda* level, covering the 58 *woredas* covered by the Pathfinder Survey. General questions were asked regarding the whole *woreda* while detailed questions were asked about the Peasant Associations (PAs/*kebeles*)<sup>78</sup> in the *woreda* covered by the Pathfinder Survey. If there were no family planning services offered in the PAs/*kebeles*, information was collected about the distance to the closest family planning service. Finally, information from the 1994 Census is used to help control for program placement.

6.70 **Instrumental variable techniques are used to address program placement issues.** The presence of a family planning program in the community is first predicted using variables which are not correlated with contraceptive use from the Census data, in effect using an instrumental variable procedure.<sup>79</sup> This allows us to purge the effect of family planning from any other contaminating factors. The estimated results are presented in Table 6.16. A more

---

<sup>75</sup> Angeles, Guilkey, and Mroz (1998).

<sup>76</sup> Miller (2005).

<sup>77</sup> Angeles, Guilkey, and Mroz (2005a); see also Angeles, Guilkey, and Mroz (2005b).

<sup>78</sup> Peasant Associations (PAs) in rural areas and *kebeles*, in urban areas, are the lowest tier of the governmental structure.

<sup>79</sup> In particular, we use the ranking of the zone within the region and the *woreda* within the zone. While fertility might be correlated with the levels of these variables, it is unlikely to be correlated with the rankings.

detailed discussion of the econometric considerations, specifically the instrumentation technique used here, is given in Appendix D.

**Table 6.16: Impact of Family Planning on Total Children Born in 2004**

	With no adjustment for FP placement			With adjustment for FP placement			
	(1) Baseline	(2) FP as of 1992	(3) FP as of 1997	(4) FP as of 2002	(5) FP as of 1992	(6) FP as of 1997	(7) FP as of 2002
FP in year & age 15-19		-0.058 [0.318]	0.107 [0.258]	0.257 [0.218]	0.000 [0.323]	0.112 [0.493]	0.637* [0.378]
FP in year & age 20-24		0.147 [0.234]	0.441* [0.225]	0.241 [0.232]	-0.061 [0.219]	-0.177 [0.622]	-0.069 [0.356]
FP in year & age 25-29		0.000 [0.210]	0.188 [0.189]	0.399* [0.206]	-0.019 [0.237]	-0.110 [0.532]	0.234 [0.288]
FP in year & age 30-34		-0.17 [0.282]	0.127 [0.212]	0.290 [0.228]	-0.377 [0.323]	0.120 [0.658]	-0.176 [0.366]
FP in year & age 35-39		-0.308 [0.387]	-0.455* [0.256]	0.023 [0.278]	-0.753* [0.431]	-0.848 [0.804]	-0.141 [0.419]
FP in year & age 40-49		-1.113** [0.427]	-0.494 [0.401]	-0.186 [0.346]	-1.210** [0.496]	-2.273* [1.167]	-0.545 [0.499]
Primary education	-0.487*** [0.118]	-0.352*** [0.125]	-0.358*** [0.123]	-0.358*** [0.125]	-0.349*** [0.126]	-0.330*** [0.126]	-0.353*** [0.127]
Secondary education	-0.734*** [0.123]	-0.420** [0.181]	-0.375** [0.178]	-0.387** [0.182]	-0.429** [0.181]	-0.438** [0.183]	-0.399** [0.180]
Religion: Orthodox	-0.354* [0.201]	-0.304 [0.199]	-0.291 [0.198]	-0.292 [0.199]	-0.309 [0.199]	-0.283 [0.193]	-0.274 [0.204]
Religion: Muslim	0.110 [0.223]	0.042 [0.214]	0.064 [0.211]	0.033 [0.210]	0.033 [0.216]	0.056 [0.222]	0.079 [0.213]
<i>Community characteristics</i>							
Mean women's education		-0.113** [0.047]	-0.114** [0.048]	-0.113** [0.048]	-0.058 [0.153]	-0.128** [0.050]	-0.116** [0.049]
PA/kebele has a market		-0.026 [0.149]	-0.076 [0.154]	-0.058 [0.153]	0.094 [0.181]	-0.004 [0.186]	-0.055 [0.156]
Topology: Mountainous		0.079 [0.173]	0.092 [0.176]	0.094 [0.181]	-0.031 [0.173]	0.062 [0.198]	0.100 [0.172]
Topology: Flat		-0.047 [0.171]	-0.027 [0.176]	-0.031 [0.173]	-0.004 [0.005]	-0.02 [0.194]	-0.021 [0.178]
Distance to nearest town		-0.001 [0.006]	-0.003 [0.006]	-0.004 [0.005]	0.599 [0.738]	0.003 [0.008]	-0.003 [0.005]

	(1) Baseline	With no adjustment for FP placement			With adjustment for FP placement		
		(2) FP as of 1992	(3) FP as of 1997	(4) FP as of 2002	(5) FP as of 1992	(6) FP as of 1997	(7) FP as of 2002
Tigray	-0.161 [0.216]	0.585 [0.721]	0.580 [0.720]	0.599 [0.738]	-0.201 [0.459]	0.568 [0.729]	0.606 [0.735]
Amhara	-0.434** [0.196]	-0.209 [0.463]	-0.241 [0.440]	-0.201 [0.459]	0.072 [0.426]	-0.389 [0.465]	-0.247 [0.456]
Oromiya	-0.058 [0.213]	0.143 [0.412]	0.124 [0.412]	0.072 [0.426]	0.245 [0.260]	-0.025 [0.442]	0.132 [0.422]
Rural	0.437*** [0.137]	0.016 [0.278]	0.161 [0.268]	0.245 [0.260]	-0.079 [0.294]	-0.183 [0.403]	0.121 [0.283]
Observations	2,294	2004	2004	2004	2,004	2,004	2,004
R-squared	0.57	0.51	0.51	0.51	0.51	0.49	0.50
Adj. R-squared	0.57	0.50	0.50	0.50	0.5	0.48	0.49

*Sources:* Authors' calculations using Pathfinder, Health Facility Survey, and Census data.

*Notes:* Robust standard errors in brackets. \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%. Regressions include a constant term, ethnicity dummies, and age dummies. Columns 2-4 include community controls for altitude, rainfall, length of growing season, and livestock percentage.

6.71 **The correlates of fertility in the Pathfinder data are consistent with results from the DHS 2005.** We first estimated the determinants of number of children born to each woman in the Pathfinder sample without reference to family planning (FP) availability (Table 6.16, column 1)<sup>80</sup> using a similar specification as before, to enable comparison of the results derived from the DHS 2000 data (Table 6.13, column 1). The patterns between the determinants and fertility are broadly consistent between these two sets of results. As expected, age (not shown) and education are strong determinants of fertility together with rural status. The average level of education of women in the community also is associated with lower cumulative fertility. The negative association of education (for the woman herself and among her peers in the community) remains robust when taking FP into account (columns 2-7), although the rural effect and regional variation is smaller in magnitude and no longer significant.

6.72 **Not taking FP placement into consideration results in misleading findings of the impact of FP.** The second set of estimations now includes the presence of FP for three specific years (Table 6.16, columns 2-4) but without taking into account the purposive placement of the FP programs. Having access to FP is associated with fewer children but only for women 40-49 who have had access for 12 years (column 2). Not taking the purposive placement of family planning programs into account can even give results that suggest that FP increases fertility for women 20-24 (in this case, column 3—these are women who have been exposed to FP for the majority of their reproductive years).

6.73 **Women in the highest age group have 1.2-2.2 fewer children when exposed to family planning.** The last set of estimations used the predicted values for the probability of having a family planning program in the PA/town taking into account the possibility of endogenous program placement (Table 6.16, columns 5-7). The main difference is that the effect of family planning now becomes substantially larger and statistically significant for older women who have had FP as of 1997 and as of 1992. We do not observe a reduction in fertility among younger women, suggesting that the impact of FP is on stopping rather than spacing of births. For the placement of FP as of 2002, we do not observe a decrease in cumulative fertility, probably in large part due to the limited exposure of the women to the FP program. That is, some of the women will have only had the program for two years. The average year the FP started (among those with any FP) is, by construction, shorter in column 7.

6.74 **Hence, there appears a substantial effect of offering family planning on fertility and the estimates found here are in line with those reported in the literature.** Nonetheless, having access to family planning is clearly not going to reduce fertility to replacement levels. To achieve replacement fertility it is imperative that women are provided with opportunities for education and income generation. On the other hand, there are a number of other benefits from family planning programs that we cannot cover here. The most important are the health benefits for both mother and children which come with increased possibilities for birth spacing (although we do not necessarily find this effect with the data here) and fewer children. Besides health benefits, fewer children are associated with higher levels of education which impacts fertility reduction.

---

<sup>80</sup> As it turned out to be impossible to match some of the *kebeles* in the *woreda* survey with those in the Pathfinder Survey 2004, data from only just over 2,000 women were used.

## CHAPTER 7. ETHIOPIA'S POPULATION TOMORROW - DEVELOPMENT AND CONTRACEPTION

7.1 **Development as contraceptive and contraceptives as development.** Chapter 5 and Chapter 6 lay the empirical basis for exploring how Ethiopia's population dynamics are likely to affect its prospects for growth and poverty reduction. The specific objectives of Chapter 7 are twofold. First, we seek to gauge how Ethiopia's demographic outlook would evolve under the current development strategies that aim to foster sustainable and gender equitable development in general, and focus on increasing sustainable income growth, improving the education of girls, and empowering women in particular. This has until most recently been the key philosophy underpinning the GoE's population policy, and could be seen as an enhanced version of the "Development as Contraceptive" strategy with a larger emphasis on expanding female education in reducing population growth. Second, we also want to gauge what Ethiopia could gain in terms of enhancing welfare and reducing poverty from complementing this sustainable and gender equitable growth strategy with population-specific interventions such as vigorous implementation of the population policy and more forceful expansion of family planning services—a "Contraceptives as Development" strategy.<sup>81</sup>

7.2 **We begin by exploring what the demographic profile would look like in 2030 given vigorous implementation of the current development strategies (as articulated in the PASDEP and the MDGs) and actual attainment of the stated objectives** in terms of educational improvement and income generation. To do so, we draw on the reduced form results from the previous chapters and simulate the effects of the proposed development programs on the evolution of fertility and mortality. Based on these results, we project the evolution of Ethiopia's population until 2030. In doing so, two scenarios are distinguished, a high and a low population growth scenario, which differ in the rate at which family planning services are expanded (and the vigor with which the population policies are implemented) over the 2000-2030 period.

7.3 **Using a dynamic Computable General Equilibrium (CGE) model (MAMS), it is subsequently explored how the economy is likely to expand and by how much poverty is likely to be reduced under these two different population growth scenarios.** Comparison of the household welfare gain and poverty reduction obtained under the faster and slower population growth scenario gives an estimate of the benefits from slower population growth, and thus the benefits of more rapid expansion of family planning services and a more vigorous implementation of the population policy. To explore how population growth interacts with economic growth and poverty reduction, we used MAMS (Maquette for MDG Simulations), a generic dynamic CGE model recently developed at the World Bank for analysis of MDG and poverty-reduction strategies and specifically adapted to the Ethiopian context. The model is already well embedded in Ethiopian policymaking. One key feature of MAMS is its detailed modules describing the social sectors, which have been specifically developed to reflect Ethiopian reality and have been carefully tested and calibrated using Ethiopian data.

---

<sup>81</sup> For a discussion of this theme in the Ethiopian context, see Ethiopian Economic Association/Ethiopian Economic Policy Research Institute (2003).

**7.4 The MAMS model is especially well suited to quantify the demographic bonus from an accelerated decline in population growth through its effects on the age structure, though it does not account for a potential growth in productivity following from technological and/or institutional innovations in response to increasing land pressure.** Population growth enters exogenously in the MAMS model and as such it does not allow for an endogenously-determined interaction between increasing land pressure and productivity growth through technological and/or institutional change (as hypothesized by Boserup). Alternatively, population growth could be modeled to increase or reduce total factor productivity (TFP), or any combination thereof over time. However, the nature of this relationship is essentially unknown (Chapter 2), and any modeling of this relationship would involve a series of arbitrary assumptions. In the current application of the model, population growth is assumed not to affect TFP directly (and vice versa).<sup>82</sup> On the other hand, the MAMS model does account explicitly for the other key channels through which population dynamics affect economic growth and poverty reduction, i.e. the relationship between the population's age structure and the economy's fiscal balances, as well as the effects of population growth on the labor market. In addition, while population growth enters exogenously in the MAMS model, great care has been taken to ensure that public expenditure patterns driving the population growth scenarios (especially the rapid expansion of school enrollment rates and the provision of family planning services) are consistent with public expenditure patterns assumed in the model.

#### **7.1 The Demographic Outlook under Different Population Growth Scenarios**

**7.5 To gauge how fertility is likely to evolve over time, we explore how implementation of the current development plans is likely to affect female adult education and household income, which together with urbanization are three key determinants of fertility.** For these simulations, the age-specific regression results presented in Appendix E are used whereby the reported coefficients reflect the estimated effects of the different determinants on the probability of having a birth in the past three years.<sup>83</sup> Based on the MDGs and the stated targets in the PASDEP, it is assumed that all girls will have completed Grade 4 (first cycle of primary school) by 2015. This implies that all 15-19 year old women will have at least some primary education by 2020. One should note, however, that despite this fast rate of progress, it will still take until 2030 before more than 95 percent of all women of childbearing age have at least some primary education. This is a result of the extremely low base level of female adult education in Ethiopia as well as the considerable inertia involved in raising the average adult education level of a population. It is further assumed that by 2030 half of the 15-19 year old women will also have some secondary education. Income per adult equivalent is assumed to grow at a sustained pace of 1.5 percent between 2000 and 2030. This is equivalent to the observed growth between 2000 and 2005. Finally, following the UN Medium Variant (2006), the urban population ratio is projected to increase from 14.9 in 2000 to 28 percent in 2030.

---

<sup>82</sup> See Galor and Weil (2000) for growth models whereby both population and economic growth are endogenized.

<sup>83</sup> To convert the estimated marginal effects of a variable on the probability of having given birth in the past three years into a marginal effect of that variable on the ASFRs, we multiplied the marginal effects by 5/3. Furthermore, coefficients which were not statistically significant were assumed to be equal to zero in the simulations. For instance, while having some primary education was found to reduce the probability of having given birth in the past three years among those 15-24 years, it did not appear to affect the probability of giving birth thereafter (i.e. the estimated coefficients were statistically insignificant).

7.6 Given the projected trends in female adult education, income growth, and urbanization, it is simulated that fertility would halve from 5.9 children in 2000 to 2.94 in 2030. The simulated effects of increased education, 1.5 percent per adult equivalent income growth, and urbanization on age-specific fertility rates (ASFRs) as well as their combined effect on the total TFR are presented in Table 7.1. While income growth alone would reduce the TFR by slightly more than one child, the largest effect comes from raising the education levels of adult women, which would reduce the TFR by slightly more than two children (from 5.87 children to 3.79). This strong decline is a result of both the direct effect of female adult education on a woman's own fertility as well as its indirect effect on the fertility of other women in the community. As the external effect on the community is likely to decline when more women become educated, we assumed that there would no longer be an external effect from 2020 onwards when all 15-19 year old women will have completed the Grade 4. Somewhat surprisingly, the contribution from urbanization to the decline in TFR is small. This follows both from the fact that at 15 percent, the urban share of the population is relatively small as well as the fact that the estimated effect of urban living on fertility itself is relatively small once the women's education level is controlled for. The large difference in TFR between rural and urban areas observed in the bivariate comparison in Chapter 6 follows largely from the great difference in education levels of female adults in rural and urban areas.

**Table 7.1: The Fertility Transition in Ethiopia Given Current Development Plans, 2000-2030**

	DHS 2000	2005	2010	2015	2020	2025	2030
<b>% women by age group with some or completed primary education</b>							
15-19	30.6	53.3	80.9	84.8	75.6	64.8	51.0
20-24	21.0	30.6	53.3	80.9	84.8	75.6	64.8
25-29	22.6	21.0	30.6	53.3	80.9	84.8	75.6
30-34	15.8	22.6	21.0	30.6	53.3	80.9	84.8
35-39	9.8	15.8	22.6	21.0	30.6	53.3	80.9
40-49	4.1	9.8	15.8	22.6	21.0	30.6	53.3
40-49	4.1	9.8	15.8	22.6	21.0	30.6	53.3
<b>% women by age group with more than primary education</b>							
15-19	4.8	10.1	12.6	15.3	24.3	35.2	49.1
20-24	6.8	4.8	10.1	12.6	15.3	24.3	35.2
25-29	6.8	6.8	4.8	10.1	12.6	15.3	24.3
30-34	4.4	6.8	6.8	4.8	10.1	12.6	15.3
35-39	3.4	4.4	6.8	6.8	4.8	10.1	12.6
40-49	1.1	3.4	4.4	6.8	6.8	4.8	10.1
40-49	1.1	3.4	4.4	6.8	6.8	4.8	10.1
<b>Effect of educational improvement on TFR</b>							
	5.87	5.26	4.78	4.34	3.83	3.81	3.79
<b>% population in urban areas</b>							
	14.9	16.2	17.8	19.8	22.3	25.3	28
<b>Effect of urbanization on TFR</b>							
	5.87	5.86	5.85	5.83	5.82	5.80	5.78
<b>Effect of 1.5% per adult equivalent growth on TFR</b>							
	5.87	5.67	5.47	5.27	5.11	4.95	4.79



	DHS 2000	2005	2010	2015	2020	2025	2030
<b>ASFRs (joint effect of education, income growth, and urbanization)</b>							
15-19	0.550	0.532	0.515	0.503	0.490	0.488	0.486
20-24	1.220	1.100	0.944	0.800	0.668	0.649	0.627
25-29	1.320	1.215	1.120	1.036	0.925	0.925	0.925
30-34	1.240	1.076	0.924	0.784	0.614	0.571	0.528
35-39	0.915	0.830	0.743	0.653	0.560	0.464	0.370
40-44	0.500	0.339	0.191	0.055	0.000	0.000	0.000
45-49	0.120	0.000	0.000	0.000	0.000	0.000	0.000
<b>TFR</b>	<b>5.87</b>	<b>5.09</b>	<b>4.44</b>	<b>3.83</b>	<b>3.26</b>	<b>3.10</b>	<b>2.94</b>

Source: Authors' calculations.

Note: Women are considered to have completed primary school when they complete Grade 8; the percentage of women 15-19 having attained only some or completed primary school declines after 2015 as more of them will have reached secondary education; if the ratios of primary and post-primary add up to 100, all women in that age group have at least some primary education; otherwise, the remaining women have no education at all.

7.7 **The simulated results obtained from the regression estimates fall within the range assumed in the different UN population growth projections and they suggest in particular that population growth in Ethiopia could be somewhat slower than the UN population projection (Medium Variant).** While any simulation rests on a series of assumptions (in this case, stability of the estimated coefficients over time and progress in the socio-economic indicators according to the envisioned targets), comparison of the predicted evolution of the TFR with different variants of the UN lends credibility to the results. The High, Medium, and Low Variant of the UN population projections predict a TFR in 2030 of 3.65, 3.15, and 2.65, respectively. The TFR derived from our micro-econometric simulations and achievement of the envisioned development outcomes, is 2.94 children, in between the Medium and Low Variant. This estimate is grounded in observed micro-behavior in the Ethiopian context and it is consistent with the ongoing development plans. This also helps us select the relevant UN projection scenario.

7.8 **Without concerted efforts to expand family planning services to keep up with the rising demand, Ethiopia is expected to follow the High Variant of the UN population projections, i.e. a TFR of 3.65 children by 2030.** Our projections, based on the reduced form estimates, implicitly assume that the supply of family planning services and contraceptives keeps up with the rising demand.<sup>84</sup> To gauge what would happen should the family planning services not be proportionally expanded, we assume that the TFR would be 0.7 children higher in 2030. This is motivated by three considerations. First, the effect of lifelong exposure to family planning is estimated between 0.5 and 1.5 fewer children in the literature, with most estimates somewhere between 0.5 and 1. This is broadly consistent with our estimates from Ethiopia itself. Second, the difference in the TFR between an increase of the CPR at its current rate of 1.32 percentage points per year (which reflects the rapid expansion in family planning services over the past five years) versus a slower rate of 1 percent per year, is 0.76 children (Table 6.12).

<sup>84</sup> Given that we do not control for the supply of family planning services in our regressions due to data limitations, the estimated coefficients on fertility of education, income, and urbanization variables will also capture the effect of family planning provisions to the extent that the latter variable is correlated with the former.

Finally, assuming a slower decline in TFR to 3.65 children in 2030 would put Ethiopia on the High Variant scenario of the UN.

**7.9 Turning to the expected evolution of mortality, we simulated the effect of reaching the female education goal on the under-five child mortality rate.** Based on the education intervention only, the under-five child mortality rate would decline from an estimated 166 children out of every 1,000 born dying before the age of five in 2000 (DHS 2000) to 76 in 2030 (Table 7.2). While well above the MDG target, this is similar to the UN estimated decline (from 172 in 2000 to 73 in 2030). One should note that this includes both the direct effect of education on child mortality, as well as its indirect effect through delayed marriage and thus delayed first birth. Given the envisioned expansion of water and sanitation services and an expansion of family planning services, which will facilitate birth spacing and thereby reduce child mortality (Bhargava, Chowdhury, and Singh, 2005), child mortality may decline even further. We therefore also consider a scenario whereby the under-five child mortality rate declines to 50 per 1,000 live births. This result is similar to applying the effects of education only to the child mortality rate of 123 reported in 2005 (compared with 166 in DHS 2000).<sup>85</sup>

**Table 7.2: The Evolution of Child Mortality in Ethiopia Given Current Development Plans, 2000-2030**

	2000	2005	2010	2015	2020	2025	2030
Average yrs of education (women 15-49 years)	1.75	3.12	4.36	5.46	6.90	8.03	8.92
Under-five mortality rate (per 1,000) with DHS 2000 as starting point and education intervention only	166	149	133	120	102	88	76
Under-five mortality rate (per 1,000) with DHS 2000 as starting point and education, sanitation and expanded family planning services <sup>1)</sup>	166	123	108	94	76	62	50

*Note:* <sup>1)</sup> This scenario is similar to the application of the effects of education only to the surprisingly low child mortality rates reported in the DHS 2005.

**7.10 The effect of HIV/AIDS on overall mortality rates as well as fertility is explicitly accounted for.** To calculate the population projections, we use the Spectrum population model (DemProj) of the Futures Group International. Age-specific mortality rates (ASMRs) were unknown for Ethiopia and following common practice, the Coale and Demeny (CD) Model Life Table West are used as approximations. These were adapted to reflect our predicted decline in child mortality rates by using the life expectancy corresponding to our predicted CMR as well as the chosen HIV/AIDS prevalence rate (Box 7.1).

**7.11 Following the Ministry of Health’s Fifth Report on HIV/AIDS 2004, we assumed that the HIV prevalence rate would start at 3.9 percent of all adults, plateau at 5 percent as soon as 2008, and remain at that level until 2030.** While the DHS 2005 estimated the HIV/AIDS prevalence rate at only 1.5 percent, we preferred to be conservative. Irrespectively, our assumptions regarding HIV/AIDS are the same across the two population growth scenarios and changing them would not affect the difference in outcomes across both scenarios, the main

<sup>85</sup> While the reported decline in child mortality between 2000 and 2005 seems rather stark, there is no good benchmark to assess the validity of either estimate.

focus of our analysis. Furthermore, while we assume HIV adult prevalence to remain constant after 2008, life expectancy at birth is nonetheless likely to improve due to improvements in immunization, nutrition, sanitation, and general hygiene. Finally, HIV/AIDS also affects fertility, and the Spectrum model assumes that HIV infected women have 10 percent less children than non-infected women.

**7.12 We consider both a high and a low population growth scenario, which in essence only differ by the rate at which family planning services are expanded.** In the high population growth variant, TFR declines to 3.65 in 2030 and the under-five child mortality rate declines to 76. In this scenario, family planning services expand at a slower rate (CPR expanding at about 0.9 percentage point per year to reach about 35.1 percent in 2030). In the low population growth variant, we assume the TFR to drop to 2.94, and the under-five child mortality to decline to 50. This scenario is referred to as the low population growth variant, even though it more closely resembles the results of the UN Medium Variant population projection. More concerted efforts are undertaken to expand FP services across the country and vigorously implement the population policy. The CPR is expected to increase at 1.32 percentage points per year reaching 47.7 percent in 2030. As mentioned above, the effect of lifetime exposure fertility has been conjectured at about 0.7, based on international and Ethiopia-specific evidence. Family planning is also assumed to accelerate the decline in child mortality, by increasing birth spacing. In a perverse manner, this will initially reduce the mitigating effect of family planning expansion on population growth. A more detailed description of the underlying assumptions is given in Box 7.1.

**7.13 While the high population growth scenario predicts a total population of 135.3 million people by 2030, the low population growth scenario estimates the total population by 2030 at 124.2 million, a difference of about 11.1 million people (Figure 7.1).** In other words, concerted efforts to expand family planning services across the country over the next 30 years would reduce the total population by 11.1 million in 2030. The population growth rate would be reduced from 2.53 percent per year in 2000 to 1.85 percent and 1.62 percent in 2030 under the high and low growth scenario, respectively. At these rates, the population would double in 37.9 or 43.1 years, respectively; up from 27.7 years in 2000 (Tables 7.3 and 7.4).

### Box 7.1: Population Projections Assumptions

Population projections were calculated with the Spectrum (DemProj) population projection model of the Futures Group International. The base population for 2000 was taken from the United Nations Population Division's population projections for Ethiopia, as assessed in 2004, Medium Variant. In the High fertility/high mortality scenario, fertility was assumed to decrease from 5.87 children per woman in 2000 to 3.65 in 2030 and the under-five child mortality rate was assumed to decrease from 166 per 1,000 births in 2000 to 76 in 2030. In the Low fertility/low mortality scenario, the decline of both TFR and the under-five child mortality rate was assumed to be sharper, from 5.87 in 2000 to 2.94 in 2030, and from 166 to 50, respectively. In both scenarios, improvements in female adult education, income growth, and urbanization proceed at the same pace. They primarily differ in the rate at which population-specific interventions, especially family planning services, expand.

The evolution of total fertility rates (TFRs) was obtained by simulating the effect of envisioned improvements in female educational achievements, income growth, and urbanization on age-specific fertility rates (Table 7.1). Similarly, the evolution of the under-five child mortality rates has been obtained by simulating the effect of gradual improvements in female adult education on child mortality (Table 7.2).

The U5MRs were then incorporated into the population projections, using expectancies of life at birth (see below) and a model life table, i.e. the Coale and Demeny (CD) Model West. In particular, as age-specific mortality rates (ASMRs) are usually unknown for most countries, it is common practice to take a model life table which most closely resembles the situation in the country under study (in this case, the CD Model West which usually provides a better fit to developing countries). Furthermore, as the Spectrum Model only allows the user to change the mortality rate by changing the HIV/AIDS prevalence rate and the life expectancy at birth (yielding CMR as a result) and not the other way around, we have chosen for each year the life expectancy which yielded our projected CMR given the selected HIV/AIDS prevalence rates through iteration. Accordingly, expectancies of life at birth were estimated in 2000 at 49.6 years for males and 52.6 years for females, increasing by 2030 to 56.1 years for males and 57.6 years for females in the high mortality scenario, and to 59.8 years for males and 61.2 years for females in the low mortality scenario. Finally, the 2000 U5MR reported in the 2004 UN Population Division's population projections are slightly higher than the ones reported in Table 7.2, which are based on DHS 2000 data. As a result, the life expectancy at birth in 2000 reported by the UN is slightly lower than the one reported here.

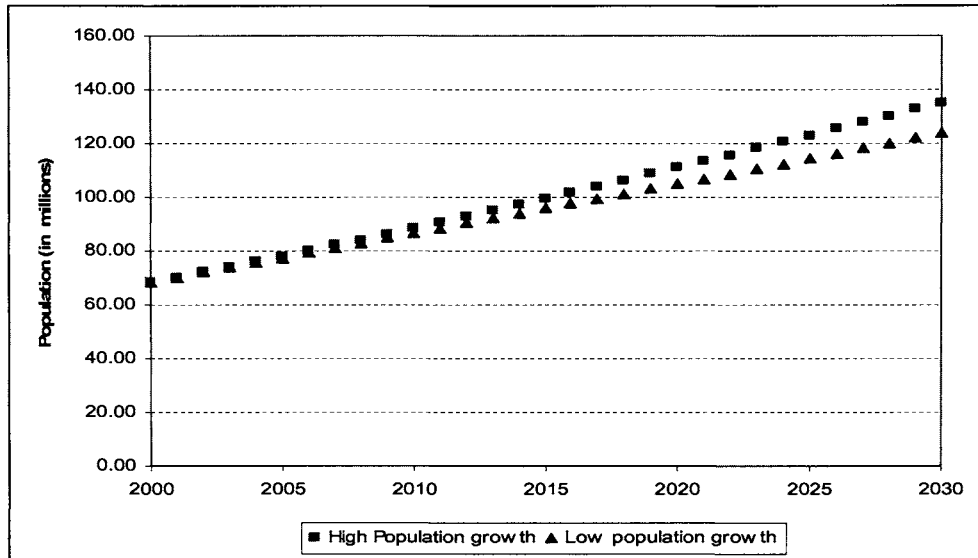
The effect of HIV/AIDS among the 15-49 year olds on population growth was also accounted for in the population projections. The adult HIV prevalence rates (age group 15-49) were estimated at 3.9 percent in 2000, to increase linearly to 5 percent in 2008, and to remain constant at 5 percent thereafter until 2030 (Ministry of Health – Disease Prevention and Control Department, 2004:7). This implies that the HIV/AIDS control program will be successful. Nevertheless, life expectancies at birth are assumed to increase over the projection period, either rapidly or less rapidly (see above), given the impact of other interventions in the area of public health (e.g. immunization, nutrition, sanitation, and general hygiene). The evolution of HIV/AIDS has been assumed the same across both population growth scenarios.

The sex ratio at birth, i.e. the number of male births per 100 female births, was assumed to be 105 boys per 100 girls, every year between 2000 and 2030.

Finally, assumptions were made regarding the international migration, i.e. 35,000 male emigrants and 23,300 female emigrants every year in 2000, increasing to 60,000 male emigrants and 40,000 female emigrants in 2030, following a linear pattern (see Chapter 1).

*Source:* Authors' assumptions and calculations.

**Figure 7.1: The Evolution of the Population under High and Low Population Growth Scenarios, 2000-2030 (million)**



Source: Authors' calculations.

**Table 7.3: Evolution of the Demographic Profile High Fertility - High Mortality Scenario, 2000-2030**

<b>Year</b>	<b>2000</b>	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>
<b>Fertility</b>							
Input TFR	5.87	5.67	5.33	4.92	4.42	3.99	3.65
Calculated TFR	5.87	5.67	5.33	4.92	4.42	3.99	3.65
Child-Woman Ratio	0.78	0.71	0.69	0.65	0.61	0.57	0.53
<b>Mortality</b>							
Male Life Expectancy (LE)	49.6	51.3	51.4	51.5	52.6	54.3	56.1
Female LE	52.6	53.3	52.2	53.1	54.3	55.9	57.6
Total LE	51.1	52.3	51.8	52.3	53.4	55.1	56.8
Infant Mortality Rate	111.2	102.4	92.9	83.1	74.1	65.2	56.6
Under 5 Mort. Rate	166.1	148.3	133.5	118.1	103.9	90.0	76.6
Life Table: CD West							
<b>Immigration (thousands)</b>							
Male Immigration	-35.0	-39.2	-43.3	-47.5	-51.7	-55.8	-60.0
Female Immigration	-23.3	-26.1	-28.9	-31.6	-34.4	-37.2	-40.0
Total Immigration	-58.3	-65.3	-72.2	-79.1	-86.1	-93.0	-100.0
<b>Vital Rates</b>							
Crude Birth Rate (per 1,000)	40.8	40.3	38.5	36.3	33.8	31.3	29.5
Crude Death Rate (per 1,000)	14.7	13.7	13.5	12.8	12.0	11.1	10.3
Rate of Natural Increase (%)	2.62	2.66	2.50	2.36	2.19	2.03	1.92
Growth Rate (%)	2.53	2.49	2.42	2.28	2.11	1.95	1.85
Doubling Time (years)	27.7	28.1	29.0	30.8	33.2	35.8	37.9
<b>Annual Births &amp; Deaths (millions)</b>							
Births	2.8	3.1	3.4	3.6	3.8	3.9	4.0
Deaths	1.0	1.1	1.2	1.3	1.3	1.4	1.4
<b>Population (millions)</b>							
Total Population	68.5	78.0	88.4	99.5	111.0	122.9	135.3
Male Population	34.0	38.8	44.1	49.8	55.7	61.8	68.1
Female Population	34.5	39.2	44.3	49.7	55.3	61.1	67.2
Percent 0-4	17.7	16.5	16.3	15.8	15.0	14.2	13.4
Percent 5-14	27.9	28.0	26.9	26.4	26.2	25.5	24.5
Percent 15-49	45.0	46.1	47.4	48.4	49.2	50.4	51.7
Percent 15-64	51.6	52.7	53.9	55.0	55.9	57.3	58.9
Percent 65 and over	2.8	2.9	2.9	2.9	2.9	3.0	3.2
Percent Females 15-49	45.1	46.2	47.4	48.4	49.1	50.2	51.4
Sex Ratio	98.7	99.1	99.7	100.3	100.7	101.1	101.4
Dependency Ratio	0.94	0.90	0.85	0.82	0.79	0.74	0.70
Median Age	17.0	18.0	18.0	19.0	19.0	20.0	21.0

*Source:* Authors' calculations.

**Table 7.4: Evolution of the Demographic Profile Low Fertility - Low Mortality Scenario, 2000-2030**

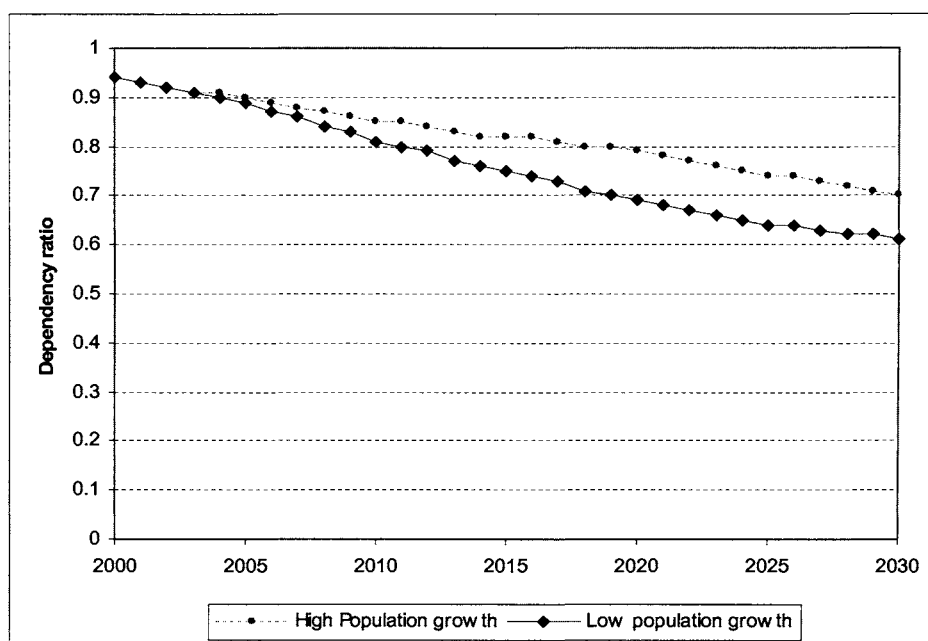
Year	2000	2005	2010	2015	2020	2025	2030
<b>Fertility</b>							
Input TFR	5.87	5.09	4.44	3.83	3.26	3.10	2.94
Calculated TFR	5.87	5.09	4.44	3.83	3.26	3.10	2.94
Child-Woman Ratio	0.78	0.68	0.62	0.56	0.51	0.48	0.46
<b>Mortality</b>							
Male Life Expectancy (LE)	49.6	51.9	52.7	53.3	55.0	57.3	59.8
Female LE	52.6	53.9	53.5	54.8	56.6	58.8	61.2
Total LE	51.1	52.9	53.1	54.0	55.8	58.1	60.5
Infant Mortality Rate	111.2	98.9	85.9	73.5	61.5	50.2	39.3
Under 5 Mort. Rate	166.1	142.9	122.5	103.0	84.1	66.7	50.3
Life Table: CD West							
<b>Immigration (thousands)</b>							
Male Immigration	-35.0	-39.2	-43.3	-47.5	-51.7	-55.8	-60.0
Female Immigration	-23.3	-26.1	-28.9	-31.6	-34.4	-37.2	-40.0
Total Immigration	-58.3	-65.3	-72.2	-79.1	-86.1	-93.0	-100.0
<b>Vital Rates</b>							
Crude Birth Rate (per 1,000)	40.8	37.5	34.5	31.6	28.2	27.5	26.0
Crude Death Rate (per 1,000)	14.7	13.0	12.4	11.6	10.6	9.8	9.0
Rate of Natural Increase (%)	2.61	2.45	2.21	2.00	1.76	1.77	1.70
Growth Rate (%)	2.53	2.36	2.13	1.92	1.68	1.69	1.62
Doubling Time (years)	27.7	29.7	33.0	36.4	41.7	41.5	43.1
<b>Annual Births &amp; Deaths (millions)</b>							
Births	2.8	2.9	3.0	3.0	3.0	3.1	3.2
Deaths	1.0	1.0	1.1	1.1	1.1	1.1	1.1
<b>Population (millions)</b>							
Total Population	68.5	77.5	86.7	95.9	104.9	114.2	124.2
Male Population	34.0	38.5	43.3	48.0	52.6	57.4	62.5
Female Population	34.5	38.9	43.4	47.9	52.3	56.9	61.7
Percent 0-4	17.7	16.0	15.1	14.2	13.1	12.5	12.2
Percent 5-14	27.9	28.2	26.9	25.5	24.6	23.3	22.1
Percent 15-49	45.0	46.5	48.5	50.4	52.0	53.2	54.0
Percent 15-64	51.6	53.0	55.1	57.3	59.1	60.8	62.1
Percent 65 and over	2.8	2.9	2.9	3.0	3.2	3.4	3.6
Percent Females 15-49	45.1	46.5	48.5	50.4	51.8	53.0	53.7
Sex Ratio	98.7	99.0	99.7	100.2	100.6	100.9	101.3
Dependency Ratio	0.94	0.89	0.81	0.75	0.69	0.64	0.61
Median Age	17.0	18.0	18.0	19.0	21.0	22.0	23.0

Source: Authors' calculations.

7.14 **The dependency ratio would decline from 0.94 to 0.70 in the high population growth scenario and to 0.61 in the low population growth scenario, enabling Ethiopia to capture the demographic bonus faster (Figure 7.2).** Micro-econometric analysis shows that higher dependency ratios are negatively associated with household welfare (World Bank, 2005c). Lower dependency ratios help increase private savings and thus private investment. A faster decline in the dependency ratio should thus be associated with an increase in household welfare. Furthermore, the changing age structure of the population will permit both a reduction in public spending, thereby freeing up resources for private investment, as well as a reallocation of public

spending from investment in human capital with lagging returns to investment in physical capital (e.g. infrastructure) with more immediate returns. It is estimated that under the low population growth scenario there would be about 4.8 million less students in primary school compared with the high population growth scenario, assuming that education expands as targeted under both scenarios. These results suggest that Ethiopia will capture the demographic bonus faster under the low population growth scenario.

**Figure 7.2: Evolution of the Dependency Ratio under High and Low Population Growth Scenarios, 2000-2030**



Source: Authors' calculations.

## 7.2 The Cost-Effectiveness of Family Planning

**7.15 Population dynamics affect economic growth and thus poverty reduction through: 1) the composition of public expenditures and the fiscal balance; 2) the labor market; and 3) total factor productivity (TFP).** The rapid *increase* in the under 18 population during the first phase of the demographic transition puts the fiscal balances under pressure as the demand for social services, especially education and health care, increases rapidly in conjunction with population growth. When this upward pressure on Government spending is not met by an equal increase in foreign resources (grants or borrowing), and assuming that the Government maintains the quality of its social service delivery systems consistent with its objective to reach the MDGs, this must be financed from domestic resources either through domestic borrowing, taxation, or diversion of public spending from other sectors. This in turn is likely to affect overall economic growth and thus poverty reduction. Second, a rapid increase in the population will, over time, translate into a rapid increase in the skilled and unskilled labor force, a blessing if the economy manages to productively employ this influx of skilled and unskilled laborers. Third, increasing population pressure may induce technological and institutional innovations, thereby generating the right conditions for accelerating TFP growth, and thus economic growth



and economic growth per capita. Yet, the rate at which more productive technologies and institutional arrangements are adopted may (at first) be too slow to fully counteract the downward pressure on income per capita from stronger population growth and the drag on productivity and economic growth induced by population pressure. This inertia could be especially problematic when thresholds of irreversible damage exist (as has been argued in the case of soil erosion and soil nutrient depletion). On the other hand, international experience and rigorous evaluation studies have shown that family planning (together with the effective implementation of population policies) can be effective tools for reducing population growth.

**7.16 The evolution of economic growth, income per capita, and poverty under the high and low population scenarios is explored running the MAMS model from 2005 to 2030.** This sheds light on the expected benefits from a more rapid expansion of family planning programs and a more vigorous implementation of the population policies. MAMS is an economy-wide simulation model specifically developed to estimate the costs of reaching the MDGs in Ethiopia. It has most recently also been used to inform the different growth and financing gap scenarios in the PASDEP. It is particularly well suited for the purposes of this study. It fully models the functioning and performance of the social sectors in Ethiopia, including the derived demands for skilled labor from an expansion of enrollment rates. Given the envisioned expansion of female education, the critical factor driving our population growth scenarios, this is important. In particular, MAMS uses detailed Ethiopia-specific information to derive the production and cost functions for the provision of social services (education, health, water access, and sanitation), and allows for increasing marginal costs in the provision of social services as a function of coverage rates. In other words, the model provides a reliable estimate of the Government's expenditures involved in educating its population and in providing it with the health care necessary to reach the MDGs. The additional expenditures involved in the provision of family planning services can also be explicitly accounted for. Finally, there is an explicit public finance balancing equation that forces additional expenditures to be offset by additional revenues, either through an increase in foreign grants, an increase in foreign or domestic borrowing, taxation, or a reduction in other Government's expenditures. In other words, the model can be used to calculate the net effect on economic growth and per capita income from an increase in Government's expenditures on family planning and a decline in social spending (following slower population growth).

**7.17 The MAMS model also accounts explicitly for the effect of population growth on labor supply and wages (which adjust to equilibrate labor demand and supply).** Three types of labor are considered: unskilled labor (with less than completed secondary school); semi-skilled labor (with completed secondary school but not completed tertiary); and skilled labor (completed tertiary school). While the ratio at which those entering the labor force are employed is fixed over time, the labor markets clear through adaptation of the wage rates for each labor category. The demand for different labor categories is explicitly modeled and determined by the labor composition of different production activities and the rate at which output changes over time as a result of profit-maximizing behavior by the producers. For Government's services, the rate of output growth is largely determined by Government's consumption demand, inducing relatively rapid growth in demand for skilled labor as Government's health and education activities expand rapidly over time. Unemployment is implicit in that only a fixed share of the labor force in each skill category is employed. However, if unemployment were explicit, for example, in a setting with a lower limit on real wages at subsistence minimum, then the negative

welfare effects of a larger influx of labor in the scenario with higher population growth would most likely be aggravated, as employment, production, and incomes would grow less rapidly.

**7.18 The evolution of the TFP is assumed independent from population growth, an appropriate assumption given limited knowledge about the exact relationship between the two, especially during the time frame considered in this analysis.**<sup>86</sup> While the MAMS model does allow us to gauge the effects of concerted family planning efforts or slower population growth on economic growth and household income per capita through the public finance and the labor market channel, it does not model the interaction between population growth and TFP. However, how population growth affects economic growth and poverty through these two channels is the essence of the demographic bonus. Moreover, letting TFP be independent of population growth seems most appropriate since the nature of the dynamic relationship between population and TFP growth is still debated in the literature. In contrast, there is an emerging consensus that there are substantial gains from moving more rapidly through the demographic transition to capture the demographic bonus faster.<sup>87</sup> In the simulations presented below, we will assume that population growth does not affect the evolution of TFP, even though it will affect growth in GDP and private income per capita through its effects on the demand for real Government's services, Government's financing needs, labor force growth, and the amount of resources available for private investment. To further gauge the effect of a more rapid expansion in family planning on headcount poverty rates, we will simulate the effect of a projected increase in private income per capita on the 2000 distribution of household consumption/income.

---

<sup>86</sup> For an analysis which explicitly models the relationships between population pressure, environmental degradation, and agricultural production, see Lutz et al. (2004).

<sup>87</sup> Birdsall, Kelley, and Sinding (2001).

### **Box 7.2: Structural Features of the MAMS Model**

The Maquette for MDG Simulation (MAMS) is an economy-wide simulation model that the World Bank has developed to analyze development strategies in different countries with an emphasis on the determination of outcomes for MDG indicators. Many of the policies and foreign aid flows targeting MDGs have strong effects throughout the economy affecting the MDG indicators through feedback effects via the labor markets, the markets for goods and services, and foreign exchange. Economy-wide analysis of MDG strategies is a necessary complement to sector studies.

MAMS integrates a relatively standard (recursive) dynamic general equilibrium (GE) model with an additional MDG module that links specific MDG-related interventions to MDG achievements. In most applications, the model has a relatively detailed treatment of Government's activities. In the current application, they are classified by function into: education (four cycles – two primary, secondary, and tertiary), health, water-sanitation, other (infrastructure), and other Government's activities. Like other production activities, they use production factors, and intermediate inputs to produce an activity-specific output (in the case of the Government, different types of services). The factors of production include three types of labor (those with less than secondary education, completed secondary education but not tertiary, and completed tertiary), public capital stocks by governmental activity (function), and a private capital stock. The Government finances its activities from domestic taxes, domestic borrowing, and foreign aid (borrowing and grants). Provision of education, health, and water-sanitation services contribute directly to the MDGs. Growth in the stock of public infrastructure capital (including roads, energy, and irrigation) contributes to overall growth by adding to the efficiency of other production activities. In the current version, the rest of the economy is treated as an aggregate sector. Its output is exported and sold domestically, competing with imports. Apart from the Government, economic institutions include one or more households, the rest of the world, and an NGO.

The model is intended to capture key interactions between the pursuit of the MDGs and the evolution of the economy and its citizens' welfare. To keep it relatively simple, it does not cover all MDGs. It focuses on the ones with the greatest cost and the greatest interaction with the rest of the economy: universal primary school completion (MDG 2 - measured by the net primary completion rate), reduced under-five and maternal mortality rates (MDGs 4 and 5), halting and reducing the incidence of HIV/AIDS (part of MDG 6), and increased access to improved water sources and sanitation (part of MDG 7). We also address achievements in terms of poverty reduction (MDG 1). These different MDGs are covered in an additional set of functions that link the level of each MDG indicator to a set of determinants. The determinants include the delivery of relevant services (in education, health, and water-sanitation) and other indicators, also allowing for the presence of synergies between MDGs, i.e. the fact that achievements in terms of one MDG can have an impact on other MDGs. Outside education, service delivery is expressed relative to the size of the population. In education, the ratio between service level and the number of students enrolled is used as the indicator of educational quality.

*Source:* MAMS Designers and Authors.

#### **7.19 In particular, the following assumptions were made when MAMS was used to simulate the two population/family planning scenarios:**

- ✓ The MAMS model was run for the period 2005-2030 (Box 7.2 for a more general description of the structure of MAMS). Under these two scenarios, population growth entered exogenously together with the associated levels of real spending on family planning (Box 7.3 for the cost of family planning in Ethiopia). The annual rates of population growth are 2.3 percent for the high case and 1.9 percent for the low case. The estimated difference in real (constant-price) spending on family planning between the two scenarios increases gradually over time with no difference in 2005 to about a US\$52 million (2005 US\$) difference in 2030.

- ✓ The cohort size entering the first Grade of primary school is also exogenous and different across the two scenarios. This difference results from different underlying population growth rates and, thus, a widening gap in absolute population size across both scenarios. By way of illustration, keeping enrollment rates constant, there would be 26.8 million children enrolled in grades 1-8 in 2030 under the high population growth scenario compared with 22 million under the low population growth scenario. The budgetary burden of providing these services has an important impact on the simulation results. Over time, the labor force entrants are fixed shares of those who leave the school system (exiting at the end of one of the cycles or dropping out during a cycle) and of those who reach the age of 10 without being in school. The educational background of the labor force entrant determines the segment (unskilled, semi-skilled, and skilled) in which s/he enters. Due to attrition (retirement or death), a fixed share of the labor force is withdrawn from the labor force each year. The rates of labor force growth will vary across the scenarios, being more rapid when population and enrollment is higher.
- ✓ Apart from the fact that spending on family planning is lower under the high population growth scenario, Government's spending (consumption and investment) on different functions is also adjusted across the two scenarios so that the following outcomes are kept constant: 1) educational quality (i.e. same amount of educational services per student); 2) child mortality (MDG 4);<sup>88</sup> 3) maternal mortality (MDG 5); 4) access to safe water and sanitation (MDGs 7a and 7b); 5) governmental services per capita (for infrastructure and other governmental services);<sup>89</sup> and 6) governmental transfers to households per capita. Given that when population growth is high, higher real spending is required to maintain the same social outcomes than when population growth is low, this means that for the scenario with high (low) population growth, governmental real spending growth is higher (lower).
- ✓ Foreign aid, borrowing, and other net inflows from the rest of the world (including remittances) were left unchanged, i.e. it was assumed that the changes in population and labor stocks did not induce donors to change aid flows or induce the country to export more or less labor. For the case with higher population growth, the differential effect of two alternative mechanisms to offset the increase in governmental spending was explored, increased domestic borrowing or higher direct taxes.
- ✓ GDP growth is determined endogenously, but a base case was run with exogenously fixed GDP growth (5 percent) to determine the external total factor productivity (TFP) growth rate. The efficiency of each sector further evolves depending on the amount of other public investment.

---

<sup>88</sup> We assumed that U5MR declines to 50 per 1,000 live births under the low population growth scenario compared with 76 per 1,000 live births under the high population growth scenario. Yet, under the former scenario, family planning services also expand more rapidly, and use of family planning reduces child mortality in itself through birth spacing. We implicitly assume that the difference in U5MR between the two scenarios follows from greater access to family planning and increased use of contraceptives. We therefore hold the increase in other health expenditures necessary to obtain a similar decline in U5MR constant across both scenarios.

<sup>89</sup> In doing so, we abstract from potential economies of scale, for example, in the provision of infrastructure and other government services (e.g. diplomatic representation, defense expenditures, etc.).

### Box 7.3: The Cost of Family Planning in Ethiopia

To obtain the total cost of providing family planning in Ethiopia, we calculated the cost of protecting a couple from conception for a full year (i.e. one couple year of protection or CYP) and multiplied this with the number of women using contraceptives. This cost varies according to the contraceptive method used, the quantity used per year, and the costs involved in service provision and follow-up.<sup>90</sup> While there are international standard costs available for contraceptives, the costs of providing the services vary greatly according to the country context, the range of suppliers, and the methods of delivery (e.g. public sector, NGOs, private voluntary organizations, social marketing, community-based distribution, pharmacists, etc.).

Estimates of the cost of service delivery were not available for Ethiopia. Instead we used estimates of method-specific delivery CYP costs from international experience as reported in Barberis and Harvey (1997). These CYP unit cost estimates include both the cost of the contraceptives and the related services. Unit CYP cost estimates for Ethiopia were then obtained by multiplying the method-specific CYP cost estimates by the contraceptive method-mix among current family planning users from the DHS 2005 data. This yielded a 1996 CYP unit cost of US\$10.78 or a 2005 CYP unit cost of US\$14.07 after accounting for inflation.<sup>91</sup> Janowitz and Bratt (1994) estimated the total CYP unit cost at US\$11.2 in 1991 corresponding to US\$16.94 in 2005. To be conservative, we used the latter estimate for our simulation purposes. The total cost of family planning under the different scenarios was subsequently obtained by multiplying the total CYP unit cost by the number of users per year. The latter number was calculated by multiplying the number of women of childbearing age (15-49 year old) in each year times the proportion of women being married and the annual contraceptive prevalence rate.

The total family planning cost in 2005 was estimated at US\$26.14 million (US\$16.94 \* 16.748 million women of childbearing age \* 0.62 (proportion of women married) \* 0.147 (contraceptive prevalence rate). Under the high population growth/low family planning scenario, this increased to US\$117.03 million (marriage rate = 0.547; CPR = 0.322; number of women of childbearing age = 35.98 million) in 2030 and to US\$159.21 million (marriage rate = 0.547; CPR = 0.477; number women of childbearing age = 36.000 million) under the low population growth/high family planning scenario, or a difference of about US\$42 million in 2030.

*Source:* Authors' calculations; see also CORHA (2004), POLICY Project (1998, 2004a, and 2004b), and Yunker (2003).

**7.20 Per capita growth slows down for the scenarios with high population growth, from 3.1 to 2.6-2.9 percent per year for GDP and from 3.1 to 2.6-2.8 percent for private consumption and the decline is larger when increased spending is financed through increased domestic borrowing.** As a result, real per capita household consumption (the welfare variable of interest) is 8-11 percent higher by 2030 when population growth is lower. Table 7.5 presents the evolution of key economic indicators over the period 2005 to 2030 for all three scenarios. As expected, higher population growth raises growth in the number of children enrolled in school, governmental consumption, and governmental investment. Differences in real GDP growth are primarily due to differences in labor and capital stock growth. However, the increase in labor force growth is relatively small (compared with the larger increase in the growth in school enrollment) given that the difference in working age population increase is

<sup>90</sup> The international CYP norms are as follows: pill, 15 cycles per year; IUD, 1 per 3.5 years; injectable contraceptives: 4 doses per year; condoms, 150 units per year; and implants, 1 per 3.5 years (female sterilization is done once). The total costs (commodity and service) of providing the different commodities were estimated as follows in US\$ (Barberis and Harvey, 1997): female sterilization, \$10.0; pill, \$14.0; IUD, \$4.0; injectable contraceptives, \$10.0; condom, \$5.0; and implants, \$16.0. On average, the commodities make up about 20 percent of the total cost while the provision of the medical services accounts for the remaining 80 percent.

<sup>91</sup> An inflation factor of 3 percent per year was applied, since costs estimates reflect the situation of the 1990s; this inflation estimate is lower than the one used usually in family planning programs (i.e. 4 percent), because costs of contraceptives have been decreasing steadily over time.

relatively small. When the increase in Government's spending is financed through domestic borrowing, private consumption growth is lower than when increased spending is financed through increased taxation. Under the latter scenario, private capital shocks and investment do not decline as fast, as the decline in income is partly offset by a decrease in private consumption. When domestic borrowing is increased, governmental investment out crowds private investment at a much higher rate.

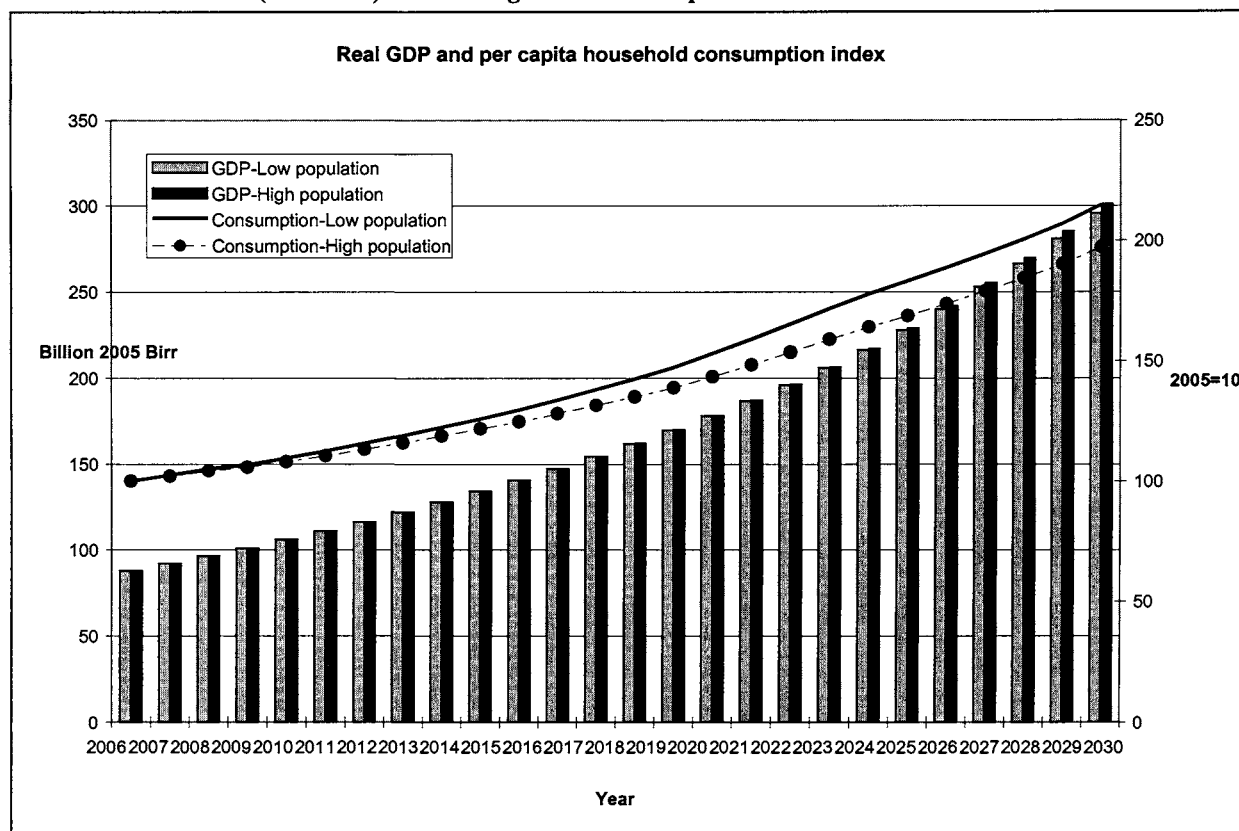
**Table 7.5: Evolution of Economic Indicators under High and Low Population Growth Scenarios, 2005-2030**

Indicator (% annual growth per year, 2005-2030)	Scenario 1: Low population growth	Scenario 2: High population growth – direct taxes adjust	Scenario 3: High population growth – domestic borrowing adjusts	Gap: Scenario 2 minus Scenario 1	Gap: Scenario 3 minus Scenario 1
Population	1.90	2.24	2.24	0.34	0.34
GDP at factor cost	5.00	5.10	4.80	0.10	-0.20
School enrollment	3.60	4.40	4.40	0.80	0.80
Labor force	0.75	0.93	0.93	0.23	0.23
Private capital stock	3.80	3.60	2.90	-0.20	-0.90
Private consumption	5.07	5.05	4.91	-0.02	-0.16
Private investment	4.85	4.59	3.37	-0.26	-1.48
Governmental consumption	5.43	5.89	5.90	0.46	0.47
Governmental investment	5.20	5.82	5.83	0.63	0.63
Private consumption per capita	3.10	2.80	2.60	-0.30	-0.50

Source: Authors' calculations.

**7.21 The Net Present Value (NPV) of the welfare gain (per capita private consumption) from the extra spending on family planning services under the low population growth scenario is estimated at US\$105-112.5 given a 5 percent discount rate.** This gain results basically from only one type of intervention and is massive. Current annual consumption per person is US\$117. Figure 7.3 depicts the evolution of Ethiopia's total GDP (in billion Ethiopian Birr) as well as the evolution of average per capita household consumption for the high and low population growth scenarios. It is projected that under the low population growth scenario average private consumption per capita in 2030 will be 8-11 percent higher than under the high population growth scenario. By summing up the discounted difference in per capita private consumption across years and converting the resulting value into 2005 US\$ using an exchange rate of 8.65 Birr per US\$, we found that the NPV of the welfare gain of additional spending on family planning services is about one half a year of current consumption per capita when using 10 percent as discount rate and equivalent to a year of per capita consumption when discounting at 5 percent. This provides a measure of the *net* welfare benefits of additional family planning efforts, as the cost of family planning is included in both scenarios. Clearly the net welfare gain is massive.

**Figure 7.3: Evolution of Ethiopia's GDP (billion 2005 ETB) and Household Consumption per Capita (2005=100) under a High<sup>1)</sup> and Low Population Growth Scenario**

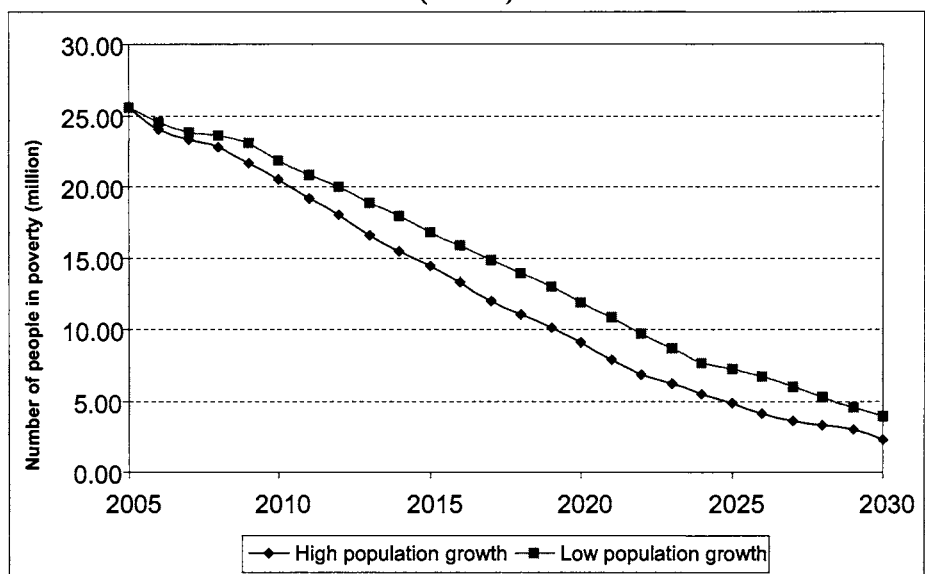


Source: Authors' calculations.

Note: <sup>1)</sup> In the high population growth scenario presented here, public finances are balanced through direct taxation.

7.22 Finally, there will be 1.5 to 3 million more people in poverty from 2010 onwards under the high population growth scenario (Figure 7.4). Assuming distribution neutral growth, the effect of different growth paths on poverty is simulated by applying the growth rate of household consumption per capita under the high and low population growth scenario to the distribution of household consumption obtained from the Household Income, Consumption, and Expenditure Survey 1999/2000 (Central Statistical Authority, 2002). To calibrate the model, we first applied the reported per capita private consumption growth (World Bank, 2006a) rates up to 2005, yielding a poverty headcount of 32.5 percent, down from 44.2 percent in 1999. Under the high population growth scenario, poverty headcount will decline to 17 percent in 2015 and 1.8 percent in 2030. Under the low population growth scenario, it is projected to decline to 15 percent in 2015 and 1.8 percent in 2030, a difference of two percentage points in 2015 and 0.9 percentage points in 2030. From 2010 onwards, there will be continuously 1.5 to 3 million more people in poverty under the high population growth scenario. This difference does not only follow from higher population growth, but also from the slower decline in the poverty head count rate. Investments in family planning also pay off in terms of poverty reduction. These are conservative estimates, as the poor tend to have larger families and they stand to gain most from better access to free family planning services. Richer households are more likely to already have access to family planning from the private sector under either scenario.

**Figure 7.4: The Number of People in Poverty under High<sup>1)</sup> and Low Population Growth Scenarios, 2005-2030 (million)**



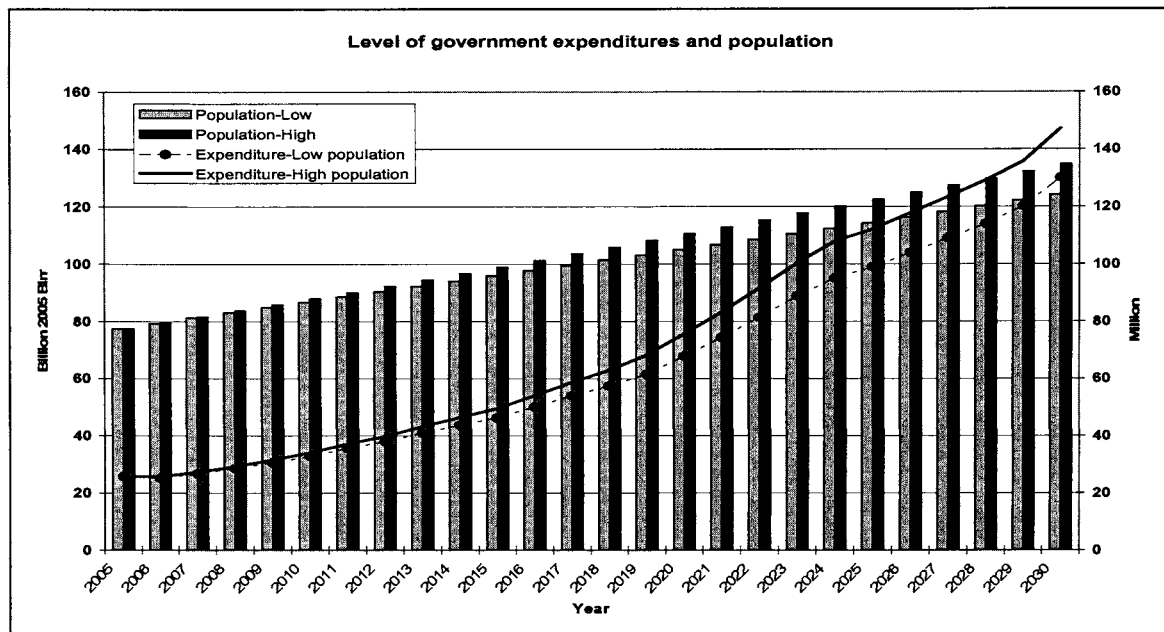
Source: Authors' calculations.

Note: <sup>1)</sup> In the high population growth scenario presented here, public finances are balanced through direct taxation.

**7.23 Slower progress in household welfare and poverty reduction under the high population growth scenario is largely driven by the decline in Government's spending on education. The slow-down is larger when the Government finances its additional spending with domestic borrowing, which directly crowds out growth-enhancing private investment. In 2030, total Government's spending is 7-14 percent (9-19 billion Birr) higher under the high population growth scenario (Figure 7.5). Real spending growth in all areas of Government's spending accelerates in a relatively uniform manner to maintain the same levels of services per capita or per student. The larger increase is recorded for the high population growth scenario with tax adjustments, under which the recurrent prices of governmental and capital spending are higher due to stronger pressures on labor markets (following from more rapid GDP growth) and less appreciation (as growth in demand for import-intensive private investment goods is higher), raising the cost of Government's investments.**



Figure 7.5: Evolution of Government's Spending and Population Size under High<sup>1)</sup> and Low Population Growth Scenarios, 2005-2030



Source: Authors' calculations.

Note: <sup>1)</sup> In the high population growth scenario presented here, public finances balance through direct taxation.

7.24 **Capturing the demographic bonus presumes productive employment of the growing pool of people of working age.** In addition to reduced spending on education, the decline in the dependency ratio also contributed to faster growth in private consumption. This requires productive employment of the increasing labor force, in particular, a much larger contribution of private sector to employment growth. A recent labor market study<sup>92</sup> identified improvement in the business climate (through improved tax administration and strengthened competition in key sectors such as trade, logistics, and capital markets) and support of the informal sector through removal of regulatory/governmental constraints to business expansion and access to factor markets (urban land tenure uncertainty and credit) as the key area of intervention. Labor market institutions (labor taxation and regulation) were not found to be a major barrier to doing business and creating jobs. Readjustment of remuneration and hiring practices in the civil service were further called for.

7.25 **In conclusion, two major messages emerge from the population projections and the MAMS simulations: 1) development is the best contraceptive; and 2) contraceptives are good for development.** Careful simulation of the effect of different development interventions, especially gender equitable development, focused on the education and the empowerment of women as well as on economic growth shows that the largest reduction in population growth will likely come from educating women—equitable development is the best contraceptive. Yet, at

<sup>92</sup> World Bank (2007b).

the same time, the simulations using the MAMS model show that at the margin there are huge welfare benefits from accelerating the decline in population growth further through population-specific interventions such as a vigorous implementation of the population policy and in particular, a swift expansion of the provision of family planning services. The gains from savings in governmental spending on social services by far outweigh the losses from reduced labor supply and increased spending on family planning. Average per capita consumption was estimated to be 8-11 percent higher in 2030 and there would be 1.5 to 3 million fewer people suffering from poverty from 2010 onwards.

## CHAPTER 8. CONCLUDING REMARKS

8.1 **Since 1993, the GoE has emphasized economic growth and gender equitable development (especially through enhanced female education) as key policy levers in reducing population growth.** These efforts are most recently being complemented with an expansion of family planning services. Part II of this report explored how these efforts are likely to affect the demographic profile as well as the evolution of economic growth and poverty by 2030. Abstracting from migration, population growth is the difference between the crude birth rate (CBR) and the crude death rate (CDR). To better understand how the GoE's development program would affect population growth, different behavioral models of fertility and mortality were estimated using micro-econometric techniques applied to household data from the Demographic and Health Survey (DHS) 2000 and the Pathfinder Survey 2004 (this analysis was complemented by data from the DHS 2005). This allowed us to estimate and compare the effect on fertility and mortality of different interventions envisioned under the GoE's development program (e.g. increasing female adult education, household income, urbanization, and provision of family planning services). Drawing on these estimated effects and keeping the other development interventions constant, we projected the evolution of the demographic profile under a slower and faster expanding family planning scenario (broadly consistent with the High Variant and Medium Variant of the United Nations population projections). Finally, a dynamic economy-wide growth model, MAMS, was used to assess the benefits from accelerating the demographic transition through a more rapid expansion of family planning services, in effect estimating the possibility for Ethiopia to capture its demographic bonus as well as its potential size.

8.2 **While CDRs have substantially declined over the past 50 years, the CDR in Ethiopia is likely to continue to drop following further declines in U5MR, thereby exercising upward pressure on population growth.** Age-specific mortality rates (ASMRs) in Ethiopia follow a J-shaped curve and the CDR is thus heavily influenced by the infant and child mortality rate. For each drop in infant mortality of 10 per 1,000 live births, population growth was estimated to increase by 0.137 percentage points. The infant mortality rate was estimated at 77 per 1,000 live births in the DHS 2005 and is bound to decline further especially given concerted efforts to reach the MDGs. We simulated that the U5MR would drop by 6.8 percentage points (or 68 deaths per 1,000 live births) in rural areas and by 2.5 percentage points in urban areas if all mothers were to attain at least four years of education and if all households who currently use surface or rainfall water for drinking were to get access to piped water. When complemented with efforts to: delay age at marriage and thus first birth; expand family planning services to space births; and target interventions to boys, Muslim populations, and regions which face higher child mortality rates, there is clearly still a lot of scope for reducing under-five child mortality, even though this will take some time. The HIV/AIDS epidemic is unlikely to fundamentally change the demographic equation if prevalence rates are maintained at the current levels (i.e. the epidemic is controlled). Estimates from the DHS 2005 suggest a decline in HIV/AIDS prevalence rates.

8.3 **While mortality has declined in Ethiopia, the pace of decline in fertility should be accelerated for the country to be able to capture its demographic bonus.** The decline in the CDR usually precedes the decline in the CBR, thereby accelerating population growth and initiating the demographic transition. While fertility has started to decline in Ethiopia, indicating

that the country is entering the second phase of its demographic transition, it is still above the sub-Saharan African average and will have to decline faster to enable Ethiopia to capture its demographic bonus more quickly. The national TFR is currently estimated at 5.7 (DHS 2005). It is 6.0 in rural areas and 2.4 in urban areas. In Addis Ababa, the TFR was found to be below replacement level, a remarkable phenomenon attributed to the delay in age at marriage as well as an increase in contraceptive use. The former may follow from a Malthusian-type response to rapidly rising housing prices and limited employment opportunities, but both the delay in marriage and the increase in contraceptives also benefit from an increase in female education and participation in the labor force.

**8.4 In exploring the determinants of fertility, both demographic (which emphasize the proximate determinants) and economic (which emphasize the intermediate determinants) approaches were followed.** The workhorse of the demographic literature on fertility is the Bongaarts model, which highlights the critical role of age at marriage and contraceptive use as key determinants of fertility. Indeed, early age at marriage and thus first birth, and extremely low use of contraceptives were found to be the key biological and behavioral factors contributing to high fertility in Ethiopia. Education, culture, and residence all substantially affect age at marriage. In particular, it was estimated that, *ceteris paribus*, women with some primary education, marry about half a year later than those without education and women with post-primary education tended to postpone marriage by about 2.5 years on average. *Ceteris paribus*, women in Amhara marry on average 3.2 years earlier than those in SNNPR, possibly a consequence of the much higher population density in the latter region (380 rural inhabitants per arable km<sup>2</sup> in SNNPR, compared with 193 in Amhara). Hogan, Berhanu, and Hailemariam (1999) reported a delay in age at marriage in SNNPR as parents were no longer able to provide their children with land, a traditional prerequisite for marriage. This could be seen as another example of a Malthusian response, i.e. an adaptation in fertility behavior to cope with downward pressure on income per capita resulting from population pressure.

**8.5 The latest numbers point to a significant increase in the contraceptive prevalence rate, albeit from historically low levels.** According to the DHS 2005, 14.7 percent of married women use some method of contraception (modern and traditional), with the use of modern contraceptive methods doubling from 6.3 percent of currently married women in 2000 to 13.9 percent in 2005. Nonetheless, stated demand for contraceptives continues to exceed actual use by a large margin resulting in a large percentage of unmet need—estimated at about 26 percent in the DHS 2005. Clearly, there remains a substantial need for expanding the use of contraceptives in Ethiopia, especially in the rural areas. Micro-econometric analysis indicates that better educated women are much more likely to use contraceptives as are women who earn cash income. Yet, with less than one year of education on average, Ethiopian adult women remain poorly educated and only one in six women in rural areas earned cash over which they had full control. The critical importance of economic opportunities for women in determining the use of contraceptives has also been observed in the Philippines and Indonesia.<sup>93</sup> For Indonesia it was estimated that 20 percent of the increase in contraceptive use during 1982-87 followed from the increase in wages for women. Contraceptive use is further associated with

---

<sup>93</sup> Degraff, Bilsborrow, and Guilkey (1997); Gertler and Molyneaux (1994).

knowledge levels and bivariate analysis from Ethiopia suggests that an expansion of family planning services goes hand in hand with an increase in the use of contraceptives.

**8.6 Micro-econometric analysis of the effect of intermediate determinants on fertility confirms the critical importance of female adult education and female empowerment, household income, urbanization, and access to family planning services in reducing fertility.** In addition to its effect on a woman's own fertility, largely through delaying age at marriage, and thus the first birth, education is also found to have externality effects, i.e. women residing in communities with more educated women tend to have fewer children *ceteris paribus*. Moreover, in contrast with what is often found in the literature, educational attainment in Ethiopia starts to affect fertility from primary school onwards, though the effects from post-primary education on fertility are stronger, which is consistent with the literature. As before, empowerment of women is associated with fewer children born. The more cash women earn, the larger their decision power over their earned cash income, and the greater their disapproval of wife beating, the lower their fertility rate tends to be. A doubling of household income is, on average, associated with 1-1.5 fewer children born. Rural women have, on average, 0.4 children more than urban women. Finally, exposure to family planning services throughout a woman's fertile period (15-49) would reduce her lifetime fertility by 0.5 to 1.5 children, with most estimates suggesting an effect at the lower end of this range. The findings of our Ethiopia-specific analysis of the effect of family planning on fertility are consistent with these international findings.

**8.7 Using the estimated results from the empirical analyses, we projected how the size and structure of Ethiopia's population would evolve by 2030 under the current development program.** In particular, we assume that all girls will complete Grade 4 (the first cycle of primary school) by 2015 (MDG 2) and that half of the 15-19 year old women will have at least some secondary education by 2030. Income per adult equivalent is assumed to grow at a sustained pace of 1.5 percent between 2000 and 2030 and the urbanization rate is assumed to increase from 14.9 percent in 2000 to 28 percent in 2030. Given this envisioned progress in female adult education, household income, and urbanization, we simulated that the TFR would decline from 5.9 in 2000 to 3.65 were family planning services to expand at a slower pace, corresponding to an increase in the CPR from 8.1 percent in 2000 to 35.1 percent in 2030. TFR would decline to 2.94 given a faster expansion of family planning services, which corresponds to an increase in the CPR to 47 percent in 2030. In addition, the U5MR was projected to decline from 166 per thousand in 2000 to 76 and 50, respectively. These scenarios are not only consistent with ongoing development programs and observed micro-behavior in Ethiopia; they also correspond broadly to the High Variant and Medium Variant of the UN Population Division projections, providing additional confidence in the results.

**8.8 Total population in 2030 is projected to increase by 11.1 million under the high population growth/low family planning scenario compared with the low population growth/high family planning scenario.** The dependency ratio would decline from 0.94 to 0.70 under the former and to 0.61 under the latter scenario. Under the high population growth/low family planning scenario, the total population of Ethiopia is projected to reach 135.3 million people in 2030, while under the low population growth/high family planning scenario it would reach 124.2 million people. These projections explicitly account for the effect of HIV/AIDS on both mortality and fertility.

8.9 **Development as the best contraceptive.** The mortality and fertility simulations illustrated that the greatest effect in reducing population growth does indeed come from overall development efforts (TFR declining by more than 2.25 children from 5.9 to 3.65), in particular, increasing female education and empowerment as well as increasing household income. Development is indeed the best contraceptive. While these results also require an expansion of family planning services, this happens at a slower pace under this scenario. This raises the question of whether the additional decline in TFR of 0.7 and U5MR of about 25 children per 1,000 live births by 2030 (associated with more rapidly expanding family planning services and more vigorous implementation of the population policy) is actually cost-effective. Put differently, are contraceptives good for development? Or, does it matter for people's welfare whether the population of Ethiopia would be 11.1 million larger in 2030? To address this question we explored how economic growth, consumption per capita, and poverty would evolve under the two different population growth scenarios using the MAMS model.

8.10 **Population dynamics affect economic growth and thus poverty reduction through: 1) the level and composition of public expenditures and thus the fiscal balance; 2) the labor market; and 3) total factor productivity (TFP).** The rapid increase in the demand for social services (especially education) associated with rapid population growth puts pressure on the Government's budget and may crowd out other spending and investment, potentially resulting in slower economic growth and lower private consumption per capita. This increase in public expenditures must be traded off against the additional costs of population-specific interventions which would in turn reduce the pressure on the budget through a slower expansion of the demand for public services. The rate at which the population grows will also affect the size of the cohorts entering the labor market and the increase in skilled and unskilled labor supply may boost overall economic growth, while reducing growth in income per capita. The MAMS model explicitly accounts for both the fiscal implications and the labor market effects of differing population growth scenarios. However, as population growth enters exogenously in the model, it does not account for potential interactions between total factor productivity (TFP) growth and population dynamics. Given our primary objective to measure the size of the demographic bonus, which follows from the effects of population growth on the Government's fiscal space and the labor market, this is appropriate for our purposes. Moreover, the literature provides little guidance on how the links between TFP and population growth should be modeled.

8.11 **Contraceptives are also good for development.** Private consumption per capita was projected to grow 0.3-0.5 percentage points faster under the low population growth scenarios (with more spending on family planning), resulting in a higher per capita consumption of 8-11 percent in 2030, and a further decrease in the poverty headcount by 0.9 percentage points in 2030. In private consumption per capita terms, the net present value (NPV) of lower population growth ranges between US\$52 and US\$112 per capita, the smaller gain is for a 10 percent discount rate and the larger gain is for a 5 percent discount rate. To ensure comparability, foreign aid and borrowing as well as other net inflows from the rest of the world were left the same in both scenarios. Similarly, primary school completion rates, the educational

quality (spending per student), child mortality,<sup>94</sup> maternal mortality, access to water and sanitation, governmental services per capita (infrastructure and other services), and governmental transfers to households per capita evolved at the same pace across the scenarios. Clearly, the additional benefits from foregone public spending on social services, especially education, by far outweigh the additional costs from elaborate efforts to more rapidly expand family planning services.

**8.12 In conclusion, gender equitable development is indeed the strongest contraceptive, but contraceptives are equally good for development, and concerted efforts to rapidly expand population-specific interventions, including family planning services, would help Ethiopia to capture its demographic bonus more rapidly.** While the largest contribution to the decline in fertility and population growth was estimated to come from the rapid expansion in female education and empowerment, as well as overall growth in income, even under this scenario, family planning services are assumed to expand, albeit at a slower pace. More importantly, it was shown that *at the margin* the benefits from accelerating the fertility transition and thus the decline in population growth through more vigorous implementation of population-specific interventions could be substantial. While the demographic bonus is only a one-time benefit that does not put a country on a permanently higher growth path, moving through the demographic transition faster does provide a substantial immediate pay off which could be critical for poverty reduction, especially in countries starting from a low base as in Ethiopia. Indeed, the NPV of the gain is equivalent to one year of a person's consumption (given a 5 percent discount rate); clearly not a small feat given that it follows from one intervention only.

---

<sup>94</sup> While U5MR declines faster in the low population grow scenario, the additional decline is attributed to the faster expansion of family planning services which in themselves also reduce child mortality through birth spacing. Assuming a similar increase in other health expenditures to take place across both scenarios is thus appropriate. The costs of family planning are separately accounted for.

## **PART III: CAPTURING THE DEMOGRAPHIC BONUS THROUGH DEVELOPMENT AND DEMOGRAPHIC ACTIONS**

The three broad entry points articulated in the National Population Policy (NPP) to redress the imbalance between demographic and economic growth are: 1) fostering overall development, especially as related to gender equity and land conservation; 2) creating a more conducive policy environment to address demographic issues; and 3) introducing population-specific interventions such as the provision of expanded family planning services. This poses two overarching questions. How can progress be advanced? And what is the appropriate relative emphasis?

The Government of Ethiopia has, in practice, largely focused on the first point, i.e. fostering shared growth and addressing gender inequity. Substantial progress has been made in reducing the gender gap in education, though tremendous challenges still lie ahead, especially in the rural (and more remote) areas, and for gender equity in general. Also, land degradation has not been vigorously addressed and poses an increasing obstacle to agricultural productivity and economic growth. The micro-econometric analysis presented in Part II of this report underscored the critical importance of fostering female education in accelerating the fertility transition.

While fostering economic development and gender equity is clearly a necessary condition, the empirical analysis in Part II shows that there are substantial additional economic and poverty gains to be obtained from accelerating fertility transition. This will require a more rapid expansion of the provision of family planning services. The Government has only recently begun to embrace the expansion of family planning services as another key factor in accelerating the demographic transition.

Moreover, the overall population policy environment will need to be revived as a necessary prerequisite to: (a) continue and expand efforts in promoting gender equity, a strategy explicitly recognized and adopted in the PASDEP; and (b) the rapid expansion and amelioration in the coverage and quality of family planning services as outlined in the Health Sector Development Program III (HSDP). While our empirical results in Part II help shed light on the importance of family planning services in reducing fertility, they could not explicitly capture the effect of the population policy environment. A recent cross-country study, which includes Ethiopia, assesses country performance both in terms of overall population policy environment and family planning services delivery. This is captured by the family planning effort (FPE) index, which includes the level of contraceptive use in the country while controlling for the country's socio-economic status.<sup>95</sup> The regression results suggest that a percentage point increase in the socio-economic index<sup>96</sup> is associated with an increase in the contraceptive prevalence rate (CPR) of 0.65 percentage points, while either a percentage point increase in the FPE score on policy, monitoring and evaluation, *or* on family planning services (including method availability) is associated with an increase in the CPR of 0.35 percent. These results are consistent with our findings in Part II that increasing overall development and fostering gender equity is

---

<sup>95</sup> Ross and Stover (2001).

<sup>96</sup> This has been obtained by applying the Borda rule to a series of socio-economic indicators related to the educational attainment, the rate of urbanization, and the level of living standards of the countries in the sample.



quantitatively the more important factor. They also confirm that population-specific interventions and a more conducive population policy environment have an important role to play in accelerating the demographic transition and fertility decline.

Part III of this report reviews how progress in each of the three intervention areas (overall development and gender equity, generation of a more conducive policy climate, and family planning services) could be advanced. Chapter 9 discusses how gender equity could be further promoted both by continuing efforts to foster female education and by implementing actions to enhance the status of women, with a particular emphasis on their participation in the labor force. The role of land tenure security in mitigating land degradation and population pressure is also briefly addressed. Chapter 10 identifies critical bottlenecks in the generation of a more conducive population policy environment. Chapter 11 examines how the coverage and quality of family planning services as well as the systems for supplying contraceptives could be further improved. This analysis is followed by concluding remarks in Chapter 12.

## CHAPTER 9. PROMOTING EQUITABLE DEVELOPMENT

9.1 **Our interest in population issues is essentially motivated by their implications for, and interactions with, people's well being.** From the extensive empirical analysis of the micro-determinants of population growth, female education, gender equity, and income/urbanization emerged as important policy levers to reduce both fertility and mortality. In this section, policies to accelerate progress in enhancing girls' enrollment and gender equity are reviewed. We refer to World Bank (2005c, 2006a, and 2006b) for in-depth discussions of policies and strategies to accelerate growth of households' farm and non-farm incomes, including the role of land tenure security and land degradation.

### 9.1 **Enhancing the Educational Attainments of Adult Women**

9.2 **Enhancing female education emerges as the most critical intervention to accelerate the demographic transition in Ethiopia.** The benefits of female education work through many channels. Enhanced female adult education delays the age at marriage and thus exposure to conception, it fosters the use of contraception, and is also important in reducing child mortality. From both a development and demographic perspective, the Government of Ethiopia is encouraged to sustain and further deepen its efforts to enhance enrollment rates and reduce the gender gap in enrollment.

9.3 **There has been remarkable progress in the educational achievements since 1993-94, but a substantial bias against investment in female education remains.** A detailed analysis of the determinants of female and male enrollment and the policy options to foster enrollment is provided in two recent World Bank Country studies on education and poverty in Ethiopia (World Bank, 2005a, 2005c). Some of the key policy insights reflected in these reports are summarized here. Between 1993-94 and 2001-02 gross enrollment tripled in primary education from 20 to 62 percent, while the ratio for secondary education rose from 8 to 12 percent, and the rate for higher education climbed from 0.5 to 1.7 percent, positive trends which have continued since. Nonetheless, controlling for all other supply- and demand-side factors such as distance to and quality of schools, household resources, and parental education, girls who reside in rural areas are 11.6 percentage points less likely to be enrolled in school compared with boys. Even in urban areas, girls are 4.3 percentage points less likely to be enrolled in school than boys. Given that most common supply and demand determinants have been controlled for, the reasons for this strong bias against female education must partially relate to cultural factors. Moreover, given the extreme low levels from which Ethiopia started, these levels were still somewhat below the SSA averages in 2001. Finally, and unfortunately, the rapid expansion of enrollment has been accompanied by a rapid deterioration of the pedagogical conditions in rural schools.

9.4 **The empirical findings discussed in-depth in the World Bank Report on Poverty suggest that supply-side interventions remain critical to increasing primary school enrollment and completion rates in Ethiopia (also for girls).** It further appears that in rural areas supply-side interventions should be mainly focused on increasing accessibility to school, especially through the construction of new schools in areas that are not served or are underserved. Remoteness from a school increases the opportunity cost of primary school attendance, and given that school children must walk to school, distance may also serve as a

direct barrier to attending primary school, especially for young girls. To facilitate an affordable and rapid expansion of primary schools, the construction standards might also be reviewed. Supply-side interventions in urban areas, where most children are already within two kilometers from a primary school, should focus on increasing the quality of education (as captured by the student-teacher ratio). The presence of female teachers may also positively affect school attendance and completion, especially for girls.

**9.5 The World Bank Report on Education further identifies a series of actions to increase the educational system's ability to respond to the increasing demand for education.** The report first calls for further prioritization of primary education in the allocation of public spending. It further advises to develop sustainable national standards for teacher recruitment and school construction and to diversify the options for managing the cost of services by supporting alternative basic education centers as an option for service delivery, accepting flexible standards to lower costs in the formal school system, reducing the subject specialization to make better use of teacher time, and including lower cost models among the options for classroom construction. The report further emphasizes the need to increase the effectiveness of the system through the deployment of teachers consistent with the size of enrollment in the schools, the progressive introduction of complete instructional programs, and the better accountability through the mobilization and mutual dissemination of performance information across *woredas* and schools.

**9.6 On the demand-side, there is a need for social protection programs which could help mitigate the negative impact of idiosyncratic shocks on school enrollment and completion, especially for girls.** There may also be opportunities to expand and improve risk mitigation practices on smallholder farms (e.g. small scale irrigation) and to introduce insurance programs (e.g. weather-based insurance) which would help buffer household food consumption and income from idiosyncratic production shocks. Given the strong association between parental (and especially female adult) education and the educational achievements of the community, the role of awareness and adult literacy campaigns should be further explored.

**9.7 A more detailed examination of why households are less likely to invest in girls' education,** particularly during times of adverse shocks, would help to inform the design of social risk management practices to protect female enrollment during such shocks, and to close the gender disparity in educational outcomes across wealth quintiles in Ethiopia. Differential returns to education among men and women may influence household investment decisions. Empirical analyses aimed at understanding labor market segmentation and wage determination by gender could thus also improve our understanding of the underlying causes of household under-investment in female education. In addition, there may be a deep-rooted cultural bias as suggested by the disempowered position of women in Ethiopian society in general. Measures to strengthen women's legal rights and expand their economic opportunities, may help to improve the standing of women and to gradually erode this bias. Finally, action research could be pursued whereby parents are encouraged to send their daughters to school, for example, through attendance bonuses (conditional cash transfers for education) or through greater involvement of the communities. Such programs should be targeted to girls and poor families.

**9.8 In this context, the potential of conditional cash transfer programs for education in Ethiopia deserves further examination.** The Government of Bangladesh, for example,

provided stipends or cash transfers to poor families for girls' secondary education. The program reduced the proportion of females aged 13-15 years who married from 19 to 14 percent and from 72 to 64 percent for females aged 16-19. This in turn resulted in a decline in infant mortality and fertility and increased economic productivity. The early results from experimentation with conditional cash programs for school in the Productive Safety Nets programs in Ethiopia are promising, suggesting that this type of intervention deserves to be explored further in Ethiopia.

## **9.2 Promoting Gender Equity and Empowerment**

**9.9 Female participation in the labor force and the empowerment status of women emerges also as important determinants of women's fertility.** The Government of Ethiopia has recognized this issue. The National Population Policy (NPP) calls for women empowerment and the PASDEP proposes concerted actions to address gender inequalities. The World Bank has also devoted a study to this issue (World Bank, 2005b). Yet, with only one in five women earning cash income over which they have control, the challenge is clearly huge.

**9.10 Traditional roles and household responsibilities are very important factors in determining the likelihood of labor market participation.** Analysis of the determinants of employment reveals that even after controlling for age, education, and household structure, women in urban Ethiopia under 25 are 32 percent less likely to be employed and women above 25 are 85 percent less likely to be employed than men. While adult women in Ethiopia are much less educated than adult men,<sup>97</sup> the effect of education on employment is complex (varying by age group, the level attained, and sex) and often does not improve one's chances of being employed compared with those who are illiterate. However, once employed, those with higher education levels tend to get better paying jobs (World Bank, 2007b).

**9.11 The provision of child care, also in public work programs, may help in fostering female participation in the labor force both in urban and rural areas.** According to the same statistical analysis, the likelihood of being employed for women above 25 declines by 9 percent for every child under 10. In contrast, the larger the number of children, the more likely men above 25 in the household will be employed. This may suggest that in addition to broader cultural factors, in urban Ethiopia as elsewhere, household responsibilities related to child rearing form a significant obstacle to labor market participation. Provision of inexpensive child care opportunities has often proved to be an effective way to alleviate this barrier, also in developed countries (Box 9.1). Other interventions to foster women's participation in the labor force include: incentives to businesses to hire women; business management training and follow-up support; and the extension of credit to female entrepreneurs.

---

<sup>97</sup> The average male adult in 1999 in urban Ethiopia had completed 5.5 grades; the average adult women had only completed Grade 4. In rural areas, the gap is even larger with the average adult male in 1999 completing 1.2 grades on average compared with 0.4 grades for the average adult women.

### Box 9.1: Provision of Low-Cost Child Care to Foster Female Labor Market Participation

Recent research highlights that concerns about the availability (and quality) of child care play an important role in a woman's decision to work. Even in countries where private and public provision of child care are widespread, women feel constrained in their choices—over 20 percent of British women between the ages 18-44 were reported to feel that child care obligations restricted them from working, while in the US, up to 30 percent of mothers of pre-school children felt constrained in their labor market choices. Research on child care options in the US reveals that there are significant differences across skill groups in terms of choices on child care, with more educated women less likely to use care by relatives and more willing to pay higher child care costs. Child care costs, however, end up accounting for a higher proportion of income for lower skilled women because they also tend to engage in less remunerative employment.

In the case of Ethiopia, the information available is not as detailed, but 66 percent of women 15+ who were inactive reported to be homemakers in 2004. Child care responsibilities not only affect participation in the labor force but they also limit the type of activities employed women can engage in. Forty-two percent of women in the informal sector survey (against 19 percent of men), for example, report to have chosen their area of activity because it is “located in the house/allows to look after children.” According to the same survey, women are three times as likely as men to work in the home. It is not surprising therefore, that many of the self-employed women are in the food preparation sector. The constraints posed by child care on women might be particularly strong for those who are the main bread-winners of the household such as divorced or widowed women with young children—the 2004 Urban Employment and Unemployment Survey reveals that 8.8 and 6.9 percent, respectively, of the women between ages 18 and 50 living in households with at least one child under five, fall into these categories. Women in these categories are likely to be concentrated in urban areas, both because of more relaxed cultural attitudes and because of selective migration to urban areas of women following divorce or marriage dissolution.

While largely absent in the African context, some low-cost child care programs have been successfully put in place in Latin American countries. In Guatemala for example, the Community Day Care Centre program established in 1991 offers a non-traditional child care alternative. Groups of parents select a woman from the neighborhood to provide care for up to 10 children. The child care provider receives a small stipend for training and food for the children is paid for jointly by the parents and the administration (supplemented by World Food Program donations). An evaluation by the International Food Policy Research Institute (IFPRI) found that parents participating in the program are very pleased and consider it both affordable (and competitive with other forms of child care, including informal ones) and needed. The income of participating mothers is 30 percent higher than other working mothers. Positive effects were also found on child nutrient intake and dietary diversity. A study of a similar program in Peru found that in urban areas it contributed to higher household income by affecting female participation in the labor market and no adverse income effect was found (i.e. households feeling richer because of the subsidized program and therefore reducing their supply to the labor force). The IFPRI evaluation of the program highlights how design features such as group size, and training and compensation of the caretaker were important for child development (for example, by affecting the amount and quality of education provided).

These considerations suggest that the belief that child care is not an important constraint to behavior of women in the labor market in developing countries (because of opportunities for child care by relatives in multi-generational and extended households) might not hold in urban areas. In addition, smaller households and the pressure to generate income suggest that child care programs might be important for both economic stability and child well-being.

*Sources:* Data from CSAg and Ruel et al. (2006).

**9.12 The Ethiopian legal framework has been substantially adapted to reflect equal rights for men and women (IPAS, 2005).** In 1995, a new Constitution prohibited laws and practices discriminating against women. It declared that women had equal rights with respect to employment, property use and ownership, inheritance, and in the formulation of development policies. The Constitution also allowed for affirmative action to remedy discrimination and inequalities. Various laws have been revised and a Family Code was passed a few years ago

eliminating prior discriminatory provisions concerning powers and obligations within marriage, divorce and property division, maintenance, and custody.

9.13 **Yet, enforcement of women's rights is challenging and implementation of legal reforms remains wanting.** Enforcement officials, judges, police, and prosecutors are not fully aware or supportive of the new laws and continue to implement the old practices. Women remain largely unaware of their rights and the new laws and they lack access to justice. In other words, the legal reforms will need to be accompanied by judiciary reforms to strengthen law enforcing institutions and ensure proper implementation of the reforms and enforcement of the laws. Interventions to better align the penal codes, the word and spirit of Article 25 of the Constitution, and the National Policy on Women could include: (1) providing training on gender sensitization to judges, lawyers, and other members of the legal profession; (2) establishing a watchdog to track changes in the law and its application; and (3) supporting legal advocacy groups and providing legal aid, women's advisory centers, and shelters for abused women.

9.14 **Moving forward, the entrenched social norms and practices that discriminate against women in society in general, and the home in particular, should also be addressed.** This includes: (1) ensuring that gender issues are appropriately addressed in all development interventions and Government's programs, both in policy and practice; (2) organizing training events for women parliamentarians and other champions of women's issues on communication skills, assertiveness, computer literacy, gender budgeting, planning, and monitoring and evaluation; and (3) continuing the focus on female education and promoting the inclusion of gender-sensitive programs in education curricula.

## **CHAPTER 10. TOWARD A MORE ENABLING POPULATION POLICY ENVIRONMENT**

**10.1 To achieve an even greater impact, ongoing equitable development policies and programs in Ethiopia will need to be accompanied by a more enabling population policy environment.** This, in turn, will help expand efforts in family planning and related policies. This chapter reviews how Ethiopia has scored on different family planning and policy environment dimensions, and in relation to other countries. The chapter discusses in particular the four elements that are needed to bring about a more enabling population policy environment, namely high level advocacy and leadership, better financing arrangements, a strengthened institutional setting and improved organizational arrangements, and the need for a sound monitoring and evaluation (M&E) system to provide continuous feedback. Key areas for improvement are identified.

**10.2 Three sources of information were used to examine Ethiopia's population-related policy and stage setting activities.** First, the 1993 National Population Policy (NPP) and its 2003 assessment were examined to determine the current situation on population issues, to review established goals and objectives, and to identify key institutions involved. Second, the family planning effort (FPE) score index was used to track progress toward fulfillment of Ethiopia's population priorities, specifically in the eight program elements that make up the index's policy and preparatory component.<sup>98</sup> Third, specific information was obtained through open-ended interviews and questionnaires with key Ethiopian stakeholders at both the national and regional levels. Information collected at the national level focused on political commitment, legal status, organizational structure to support population policy, and financial and human resources. Information collected at the regional level focused on the implementation of program services for population and reproductive health. The regions surveyed were Oromiya, Amhara, Tigray, and Southern Nations, Nationalities, and People's Region (SNNPR).

### **10.1 High Level Advocacy and Leadership**

**10.3 Ethiopia's achievement in its policy and preparatory activities were rated as moderately good in the early 1990s but declined in 2002, although a revival has occurred recently.** The family planning effort (FPE) score index methodology, in which there are four major categories, was used (Futures Group International, 2002). Ethiopia's score on policy and monitoring and evaluation-related issues accounts for 43 percent of the total FPE score. These two dimensions are crucial and it may be argued that they are a prerequisite for meaningful organization of family planning programs. The two other categories account for 57 percent of the total FPE score and pertain to family planning (FP) and related activities as well as the adequacy of the contraceptive method-mix (i.e. the supply-side dimension of family planning programs, which will be discussed in Chapter 11).

---

<sup>98</sup> It should be kept in mind that the family planning score is focused on the family planning program and does not always capture the other dimensions of the population policy context. Moreover, the latest FPE score available for Ethiopia was established in 2002 and many developments have taken place in the last three years in the areas of population and reproductive health.

10.4 **Regarding the policy index score, Ethiopia peaked in 1994 at 61 percent just after the adoption of the National Population Policy (NPP), but slid back to approximately 47 percent in 2002 reflecting the modest level of implementation of adopted policies.** The policy index score is itself the result of performance in different sub-areas, in particular the level of leadership, the availability of a national population policy, the country's financial contribution to family planning, institutional/legal arrangements as they pertain to family planning issues, and the level of coordination between different ministries on population issues. Table 10.1 presents the evolution in the policy and stage setting score across its different dimensions from 1994 until 2002.<sup>99</sup> The maximum score is 100 percent, though few countries score above 80 percent. At 47 percent, Ethiopia scores below the 1999 worldwide average of 55 percent and below the average for both Anglophone (57 percent) and Francophone (55 percent) Africa.

**Table 10.1: The Distribution of Scores for Policy, 1994-2002**

Items of the policy and stage setting activities (%)	1994	1999	2002
Policy on fertility reduction and family planning	100	83	92
Statements by leaders	100	67	33
Level of program leadership	54	31	27
Policy on age at marriage	31	33	31
Import laws and legal regulations	70	67	63
Advertising of contraceptives allowed	63	0	58
Involvement of other ministries and public agencies	73	100	74
Percent of in-country funding of the family planning budget	0	0	0
<b>Total score</b>	<b>61</b>	<b>47.6</b>	<b>47.3</b>

*Source:* Futures Group International (2002).

<sup>99</sup> Each element has scores ranging from 0 to 4. The average across these items yields the total policy and preparatory score. The scores are converted to percentages for ease of comparison. A total score between 0-24 means very weak/none; 25-54, weak; 55-79, moderate; and 80 and above signifies strong efforts. National and international experts that were consulted in each survey round (a self-administered questionnaire) to construct the different scores include: Government's officials directly involved in the implementation of the NPP; staff from bilateral donors, international organizations, and NGOs close to the program; and citizens as well as foreigners familiar with (though not necessarily involved in) the program.



10.5 **Recent developments suggest renewed commitment among Ethiopian leadership for population and reproductive health activities.** If a new round were conducted today, the FPE methodology would most likely yield a much higher score. For instance, recent statements by Ethiopian leaders have addressed population issues more openly (Box 10.1) and these issues are also explicitly addressed in the PASDEP. Furthermore, the minimum age of marriage has been increased to at least 18 years for girls and boys in the revised Family Law of Ethiopia issued in 2000.<sup>100</sup> Other laws pertaining to reproductive health and rights have been amended as well, for instance in the areas for female genital cutting (FGC), abduction, and rape. The revised 2005 Criminal Code allows abortion in cases of rape, incest, danger to the woman and fetus's health, and minors who are physically or psychologically unable to raise a child. Prior to 2005, abortion was allowed only to save a woman's life. Moreover, the liberalized provisions on abortion allow for reduced penalties when poverty and other social factors are considerations.<sup>101</sup> The Guidelines for safe abortion services have been issued in 2006 (Ministry of Health, 2006b). Although the implementation of these legal provisions may prove challenging, the new documents represent major advances in the area of reproductive health rights in Ethiopia. Finally, Ethiopia has also started at federal level (Ministry of health) and in some regions, to put its own resources into family planning budgets and activities, in particular to purchase commodities.

**Box 10.1: Faith-Based Organizations and Religious Leaders Advocate against Early Marriage**

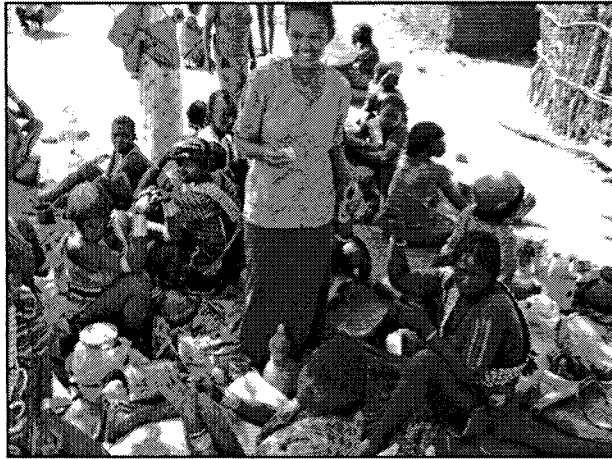
Regular advocacy and sensitization workshops with religious leaders have been crucial to the spread of positive perceptions related to reproductive health. Poor Ethiopians value the guidance of religious and community-based institutions. Therefore, Pathfinder International Ethiopia's (PIE) involvement with faith-based organizations and religious leaders has played an important role in advocating against harmful traditional practices, helping prevent more than 12,000 early marriages in the Amhara and Tigray regions in 2005—an important step toward delaying the age at first marriage.

Imam Wolchafo described the change in his community as follows: "before (...) nobody cared about our problems. Our women gave birth to many children. Due to early marriage and frequent childbirth, women suffered physically and children were malnourished. Our women look good now. Our children are not malnourished anymore." Abba Mekak Genet Dejen, a member of the Early Marriage and *Woreda* Advisory committees added that "there was a serious lack of awareness on the part of the priests and their followers. People did not see the problems resulting from early marriage or could not make the connection between the consequences, like fistula, and early marriage. But now people know... Now they see that girls cannot handle childbirth at such a young age."

Involving faith-based organizations and religious leaders has prompted the participation of well-respected members of the community, teachers, parents, and women and girls themselves to advocate against harmful traditional practices such as early marriage. It has also supported the work of Community Based Reproductive Health Agents (CBRHAs) by creating a more enabling environment for community members to discuss sensitive topics such as family planning and contraceptive use (see Box 11.1 on the success of CBRHAs).

<sup>100</sup> Article 7, sub-article 1 of the revised Family Law of Ethiopia of 2000 states that "Neither a man or a woman who has not attained the full age of 18 years shall conclude marriage." Article 7, sub-article 2, states that if there is a problem and the parents or guardians or those to marry seek permission from the Ministry of Justice, a marriage can be concluded two years earlier than the provision in sub-article 1 of Article 7. However, some regions such as Amhara and Tigray have serious problems of early marriages and are trying to reinforce marriage age to 18 for females and 21 for males. This initiative is being supported by gender activists and several ministries (Women, Health, and Youth).

<sup>101</sup> Knowledgeable observers estimate that a range of trained providers performed over 30,000 safe abortions in Addis Ababa in 2005.



*Buzayo Rata counsels Hamer semi-nomadic women on using oral contraceptives at the end of the market day in Key Afer, SNNPR.*

Sources: EGLDAM (2005) and Pathfinder International Ethiopia (2006a, 2006b).

**10.6 Political support to population-specific programs needs to be further strengthened.** The varying level of commitment among policy-makers and stakeholders in implementing the NPP remains a challenge. While Ethiopia scored very well in terms of its policy, it is generally perceived that commitment to policy implementation had declined over the past decade before picking up in recent years. The policy score was 100 percent immediately following the development of the NPP.<sup>102</sup> Thereafter, the policy score declined to 83 percent in 1999, but rose to 92 percent in 2002, reflecting increased support on the part of the Government to reduce population growth and promote family planning activities (Table 10.1). Other dimensions of the policy score have also declined in the past decade but, as mentioned, this has changed recently, both at federal and regional levels.

**10.7 The absence of a National Population Council (NPC), which explains Ethiopia's fluctuating policy score, is currently being addressed by the Government.** Following the formulation of the NPP, the NPC was meant to: a) develop specific policies and programs pertaining to population and development while encouraging inter-sector collaboration; b) define a legal framework conducive to information, education, and communication (IEC); and c) recommend actions leading to a significant reduction of the high level of fertility (Transitional Government of Ethiopia, 1993). Since the NPC had not been established, the enabling policy environment this key institution was meant to provide has not been created. It also follows that no comprehensive implementation plan took shape. A plan of action sets reasonable goals, lays out institutional responsibility for each activity, and incorporates mechanisms for monitoring and evaluation. It not only clearly defines the division of labor among key players but also clarifies the coordinating activities of the National Office of Population (NOP), making policy implementation more effective and efficient. However, the Government is now in the process of establishing the National Population Council (NPC). It has also established a drafting committee of the National Plan of Action for the implementation of the NPP, to involve relevant

---

<sup>102</sup> It should be pointed out that the fertility reduction goal of the NPP was probably too ambitious, with a target of 4.0 children per woman by 2015 (from 7.7 at the time of NPP drafting).

governmental and non-governmental organizations. Changes in political awareness and renewed political commitment are also exemplified by recent developments in the Parliament of Ethiopia (Box 10.2).

**Box 10.2: Population Issues get Attention in the Ethiopian Parliament**

An important function of the Women's Committee in the Ethiopian Parliament is to oversee and advocate for the improvement of the status of women through the integration of women's issues in sector programs.

The Women's Committee organized field visits in collaboration with the National Office of Population (NOP) and other NGO partners in family planning to help members of the Ethiopian Parliament better appreciate the challenges women face in preserving their reproductive health. Visits were made to zones, *woredas*, and *kebeles* in Amhara, Oromiya, and SNNPR. Interviews were conducted with both users and non users of FP services and addressed the challenges service providers face at the grassroots level. The visits were videotaped and shown to members of the Ethiopian Parliament.

The purpose of these visits and a series of similar advocacy efforts was to raise awareness and bring to the attention of the Government the constraints faced in empowering women and expanding FP/RH services, including issues of insufficient budgetary allocation. In addition to these efforts, the Women's Committee also listened to plans and reports of FP/RH programs in the country.

Similar field visits for Parliamentarians were organized again in 2006 by the Population Department at MOFED in collaboration with partners' organizations. These visits covered the same regions and Tigray.

*Source:* Interviews conducted in February, 2005.

10.8 **Finally, the overall Ethiopian legal framework is found to be supportive of population and reproductive health activities.** The legal regulations governing the import of contraceptive supplies not manufactured locally, as well as the laws governing advertising of contraceptives in the mass media, are found to be relatively facilitative. The FPE scores on both fronts hover around 60-70 percent (Table 10.1). In addition, as mentioned, the minimum legal age at marriage has been increased to 18 years for girls (it has remained the same for boys).

## 10.2 Better Financing Arrangements

10.9 **The implementation of a wide array of activities in the area of population (e.g. advocacy, information, education, and communication, family planning services, monitoring and evaluation systems, etc.) requires substantial resources.** Although it is always difficult to estimate the cost of implementing a national population policy, such an exercise has been tentatively conducted for Ethiopia with the development of a draft implementation plan of the National Population Policy (NPP). It has been estimated that approximately US\$56 million would be required to implement the ten-year NPP. Such a large amount would need to be distributed among several Line Ministries, administrations, and/or NGOs, both at the national (federal) and sub-national (regional) levels. The Ministry of Health (MOH) would need a significant allocation of resources for the delivery of quality family planning services, including information, education, and communication (IEC) campaigns. Other ministries, administrations, and/or NGOs would also need resources to carry out programs and activities needed to implement other aspects of the NPP.

10.10 **Inadequate financing and volatility of donors' funding have hampered the implementation of the NPP.** It has been estimated that US\$56 million were required for the overall implementation of the NPP during a 10-year period and this amount was to be distributed among several Line Ministries. The NOP received from the Government an annual budget averaging about 1.2 million Birr (US\$138,000). Nevertheless, the NOP also received donors' funding, mostly from UNFPA, to support capacity building, IEC and advocacy activities, and integration of population issues into development plans. In fact, donors and NGOs have financed substantial portions of implementation-related activities of the NPP at the national level and in almost all regions. However, the size and level of activities has fluctuated with the availability of funds, leading to uneven performance.

10.11 **To ensure reliable and sustained financing of population interventions, the Government needs to commit to take on a larger part of the costs, including those related to commodities.** Donors' dynamics, especially the volatility of donors' funding, and the late release of funding, are major bottlenecks precluding the full and smooth implementation of the NPP. In the last few years, donors' support has declined, although USAID has strongly supported family planning activities through NGOs, mostly at the regional level. However, domestic sources of funding have recently emerged and more will be necessary to ensure a reliable supply of funds and thus an uninterrupted flow of commodities. For instance, the PASDEP has earmarked funds for the implementation of health interventions, e.g. in reproductive health, which will have an impact on population trends. Domestic resources would be required incrementally and need to be included in the Medium-Term Expenditure Framework (MTEF). Given the fungible nature of financing and other competing and emerging priorities, public expenditure reviews (PERs) should be used to track investments to ensure the full implementation of the NPP. As already mentioned, in terms of Ethiopian funding for contraceptives, some recent improvements have taken place at the regional level. This requires greater coordination of efforts and it should be noted that donors' coordination has improved in recent years, at least at the national level.

### 10.3 Institutional Arrangements

10.12 **Institutional arrangements are another crucial dimension for the effective implementation of nationwide population interventions.** In a country as big and varied as Ethiopia, the institutional setting and organizational arrangements will need to address the "vertical" coordination of population activities. This is the coordination of activities between four different levels, i.e. federal, regional, *woreda*, and *kebele*. However, coordination will also need to take place "horizontally", at all four levels, since population interventions are multi-sector in nature and must involve several Line Ministries and administrations as well as NGOs and communities.

10.13 **Traditional vertical programs reveal missed opportunities in maximizing the population's access to critical information and services.** For instance, integration of family planning and HIV/AIDS programs makes it possible to maximize scarce financial and human resources. Gender inequality, poverty, and social marginalization of the most vulnerable populations are shared causes for sexual and reproductive ill-health and HIV/AIDS infection. Therefore, common ground for both HIV and pregnancy prevention among young people is the empowerment and decision-making skills that allow them to make informed and responsible

choices. Harmonizing the NPP and the National HIV/AIDS strategy protocols improves both the quality and efficiency of services by providing dual protection methods at health facilities and to communities.

10.14 **Yet, the recommended institutional arrangements for the coordination of the NPP were not fully implemented.** In particular, the NPC and Regional Population Councils (RPC) were not established, although the Government is in the process of establishing the NPC and the SNNPR region has already established a RPC. As noted in the ten-year review of the NPP conducted in 2003, the absence of the NPC precluded the strong political presence necessary for successful NPP implementation. The NOP itself was housed eventually in the Ministry of Finance and Economic Development (MOFED) and not in the Office of the Prime Minister. In 2006, the NOP reorganized as the Population Department (PD) of the MOFED, particularly to facilitate the integration of population issues into development strategies, programs, and plans. However, some Regional Offices of Population (ROPs) were relegated to departments or units within other regional administrative antennae (e.g. the Bureaus of Finance and Economic Development). Often, these ROPs lacked a high profile within the regional administrative structure.

10.15 **Consequently, the coordination between multi-sector activities at the regional level is still inadequate.** The absence of the NPC and the RPCs hampered the coordination of multi-sector activities envisioned to implement the NPP. The NPC was designed to provide the necessary legal framework and political clout to the NOP to delegate regional responsibility to coordinate, monitor, and evaluate multi-sector population activities. However, poor coordination has led to the lack of a comprehensive national plan encompassing all key players and Line Ministries. Nevertheless, there is a Program Coordinating Committee composed of the Ministry of Health (MOH), the Ministry of Education (MOE), and others ministries, mainly for preparing and implementing the UNFPA program. This is the only functional coordinating mechanism that exists at present which involves Government's Line Ministries along with a development partner. Still, ministries such as the Ministry of Agriculture (MOA) and the Ministry of Labour and Social Affairs (MOLSA) could be more involved. In fact, both are interested in receiving additional assistance from the NOP/PD and other ministries already participating on the Committee, such as the MOH. Although MOLSA is a member of the Coordinating Committee, it is not fully taking advantage of that opportunity. Both MOA and MOLSA have substantially large programs to train women for life improvement. If they shared training materials and expertise of NOP and MOH in reproductive health/family planning (RH/FP), both sides could benefit (Box 10.3).

### Box 10.3: Population Intervention Synergies among Various Sectors and Ministries

Possible synergies between various sectors and Line Ministries in enhancing the efficiency of population interventions are well illustrated by the cases of the Ministry of Agriculture (MOA) and the Ministry of Labour and Social Affairs (MOLSA).

The main responsibility of the **Women's Affairs Department of MOA** is to mainstream gender issues in the agricultural program/setting. Activities include: training rural women by development agents; evaluating the gender component in various agricultural programs; cooperating with other departments (especially Agricultural Extension) to make sure women are primary beneficiaries; and disseminating RH/FP information among rural women in cooperation with MOH, NOP, and the PM's Office of Women's Affairs.

For instance, the current MOA plan of training rural women targets 15,000 women every year and 48,000 will be reached in three years. Women's advocacy issues are included in training materials such as female education, early marriage, reproductive health, and family planning. In training/disseminating information for RH/FP, the Department strongly requests assistance from the MOH/NOP in terms of sharing information packages, training agents, and material development, even though this collaboration does not always function well.

**The Ministry of Labour and Social Affairs (MOLSA)** has a legal mandate to establish the Department of Women's Affairs (the only legalized women's affairs office among the ministries).

As part of their duties, the Department of Women's Affairs undertakes studies regarding special governmental assistance to women, creates awareness, and promotes partnerships in implementing programs, capacity building, and monitoring and evaluation (M&E). In the area of family planning and reproductive health, the Department trained 200 experts in information, education, and communication (IEC) for population education and FP in 2004 at the regional, *woreda*, and community levels; studied the effect of early marriage on population growth, women's health, and women's capacity for employment with the Department of Child and Family Affairs (this involved the UNFPA, MOH, and other ministries); and utilized the budget efficiently, although the 2003/04 budget came late and was allocated to an ongoing program.

MOLSA's future plans include: capacity building at the regional level; poverty reduction, especially among poor women; civil service review to address lack of capacity at all levels; and strengthening leadership capacity.

*Source:* Interviews conducted in February, 2005.

10.16 **Priority given to population issues also differs among regions.** In most regions surveyed, with the notable exception of SNNPR, collaboration among various regional population programs was either non-existent or inefficient. Interviews with ROP staff in Amhara, Oromiya, Tigray, and SNNPR revealed that the nature and size of problems were quite different throughout the country. Most regions did not have specific population program goals. Although SNNPR has made remarkable achievements in addressing its population concerns (Box 10.4), the coordination of population-related programs by the ROPs in the other three regions did not happen. Furthermore, there was limited civil society involvement in the implementation of population programs and projects. Inefficiency among ROPs during this process was widespread due to a shortage of qualified personnel and lack of resources.

#### Box 10.4: SNNPR is moving Faster on Population Issues

The Southern Nations, Nationalities, and People's Region (SNNPR) is distinct among regions in gaining political support in implementing the National Population Policy (NPP). The President and senior SNNPR Government officials have been involved at various steps of the NPP implementation process. It has been stated at various SNNPR regional forums that the issue of population is of great concern and therefore that appropriate action must be taken. The level of understanding and commitment is expressed at every relevant bureau, namely Education, Health, Labour, and Social Affairs.

Political commitment in the region is reflected in the institutional setup and the resources allocated. The regional Government established the Regional Population Council (RPC) comprised of relevant governmental and non-governmental institutions and is headed by the President of the region. This form of institutional arrangement is also put in place in zones and in most *woredas*. The RPC meets twice a year to give policy and program a direction, define a broad legal framework, and review plans for the implementation of population activities in the region.

The region has also legally established a Secretariat office entitled Bureau of Statistics and Population that coordinates, follows up, and evaluates multi-sector population activities. Moreover, a Multi-Sector Population Technical Committee was established comprised of the members of RPC and representatives of key sector bureaus and NGOs. The Committee is responsible for planning and programming multi-sector population undertakings. This form of arrangement is replicated at zonal and *woreda* levels though so far, it has not been effective at these levels.

Generally, this kind of institutional arrangement becomes practical and effective when a strong political commitment emerges. Although it is too early to assess effectiveness, it is a good approach to coordinate, plan, and monitor and evaluate population activities run by all concerned bodies including governmental and non-governmental institutions. In particular, the inclusion of NGOs (who are major stakeholders) in the RPC facilitates the coordination of NGO activities.

One advantage from having an RPC, an ROP, and a Multi-Sector Population Technical Committee is the development of a five-year strategic plan in 1992 EC (Ethiopian Calendar) that encompasses issues such as environment, food security, and population. As a result, population issues have been included in development plans and programs in every sector office and guided by the regional population policy. The regional strategy has identified M&E tools and guidelines to track the progress of population programs. The goals, which include RH/FP service, delivery, school coverage, health coverage, agricultural productivity, and IEC/Advocacy, are monitored annually. As members of the RPC and the Multi-Sector Population Technical Committee, the Education and Health Bureaus are playing an active role in the implementation of the NPP. For instance, the Education Bureau has incorporated FP/RH issues into the education curriculum. Moreover, a number of anti-HIV clubs have been formed in schools.

*Source:* Interviews conducted in February, 2005.

**10.17 ROPs suffer from both a shortage of human resources and high staff turnover, limiting the effective implementation of the NPP.** Inadequate staffing and poor retention of good staff have hampered the institutional capacity of both the NOP/PD and ROPs. In addition, posts approved by the Civil Service Commission might not be filled. Even in SNNPR where population issues have received more attention, not all posts are filled among those that are needed. In Tigray's ROP, the longevity of office staff is 2-3 years on average. In Amhara's ROP, turnover is high with staff staying no longer than 18 months on average. Reasons for staff turnover include low salaries, better opportunities in the private sector, and migration out of the country.

## 10.4 Monitoring and Evaluation Systems

10.18 **Monitoring and evaluation (M&E) is a key function of any population program, which is needed to ensure continuous follow-up and help build feedback mechanisms.** Assessment of record keeping and evaluation is one of the four components of the FPE index. It assesses the country's performance in terms of record keeping, evaluation, and management's use of evaluation findings. While Ethiopia's recording and evaluation system somewhat improved over time (from 34 percent in 1994 to 43 percent in 2002), the score of 43 percent also indicates that there remains substantial room for further improvement.

10.19 **Setting targets provides an important policy-making tool, though current population-related targets appear somewhat too ambitious.** Targets are useful tools to help focus attention and mobilize resources. By monitoring achievement toward these benchmarks, implementation bottlenecks can be identified and remedial action taken. The inclusion of population-related targets in the PASDEP is very important in this context. Yet, targets are only as effective if they are SMART, i.e. Specific, Monitorable, Achievable, Realistic, and Time-bound. The two major population-related targets included in the PASDEP are: 1) a reduction of the total fertility rate (TFR) from 5.9 in 2000 to 4.0 by 2010, and 2) an increase in the contraceptive prevalence rate (CPR) from 23 percent in 2003/4 to 45 percent by 2010. Both targets seem quite ambitious in light of empirical insight regarding people's behavior as well as trends observed in other countries. Our simulations suggest that a decline in the TFR from 5.9 in 2000 to 4.4 by 2010 would be achievable when accompanied by vigorous expansion of family planning services and quality improvements in service delivery. Similarly, the purported decline in TFR implies an annual increase in the CPR of more than three percentage points, which largely exceeds the two percentage point annual increase observed among the best performing countries (Ethiopia has achieved an increase in modern contraceptive use of 1.32 percentage points annually between 2000 and 2005, which is already impressive).<sup>103</sup>

10.20 **In addition, population-related programmatic targets should be precisely specified.** To be effective, targets should be clearly defined *ex ante* to avoid confusion and enable meaningful comparison over time. For example, the estimated TFR differs depending on when one uses the three or the five year reference points preceding the survey date. The reference points should thus be agreed upon *ex ante*. Similarly, the CPR differs depending on the exact definition used. For example, when considering all currently married women who use either modern or traditional contraceptive methods, the CPR is estimated at 14.7 percent according to the Demographic and Health Survey 2005. However, it is only 13.9 percent when one considers only modern methods. Moreover, there are discrepancies between the DHS estimate and the estimates reported from service statistics. This underscores the need to also identify the data source which will be used to track progress on certain goals. For some indicators, administrative and survey data often yield different results—higher and lower, respectively.

10.21 **Substantial progress has been made in Ethiopia regarding the regular collection of reliable data on fertility and mortality, but important gaps remain.** Three areas need

---

<sup>103</sup> Guengant and May (2006).



particular attention: 1) supply-side statistics (i.e. a facility survey); 2) Census data; and 3) vital registration statistics. Through the Demographic and Health Surveys 2000 and 2005, the Government of Ethiopia has built up an impressive database on fertility, mortality, and health-related issues. However, it lacks information on the functioning of health and family planning facilities. An extensive and systematic Health Facility Survey (HFS) linked to the DHS is needed to help bridge this gap. Regarding population stock data, the latest available Population and Housing Census data were collected in 1994. As a result there is substantial uncertainty about the size of Ethiopia's population as well as its spatial distribution (including the rate of urbanization). Internal migration patterns are also poorly understood. This information is critical in order to anticipate the demand for social services and to properly target services throughout the country. A new Population and Housing Census was conducted in May 2007 (this is the third Census organized in Ethiopia, following the censuses of 1984 and 1994). Finally, vital registration statistics will also need to be improved in order to provide annual estimates of mortality and fertility rates which, as of today, can only be estimated through expensive demographic surveys. Strengthening the vital registration system is critical to obtaining reliable statistics for evaluation purposes. A review of the vital registration system, legal framework, organizational aspects, and systems design including training needs and quality control aspects should be conducted at the national and regional levels.

**10.22 Furthermore, the analytical capacity and the information flow between analysts and policy-makers needs to be strengthened as well.** The wide scope and easy availability of demographic and family planning data have stimulated an array of analyses and an active Ethiopian research community, enhancing policy-makers' understanding of fertility, mortality, and health issues in Ethiopia. However, domestic capacity to undertake rigorous analysis should be strengthened as more indicators will be needed to monitor and understand the effectiveness of expanded programs. In addition, the information flow between researchers of demographic and reproductive health issues and policy-makers should also be encouraged. This would result in the application of analytical findings into sound, targeted, and SMART programs.

**10.23 In conclusion, the ongoing equitable development policies and programs in Ethiopia will be maximized through expanded efforts in family planning services. For this to happen, Ethiopia will need a more enabling population policy environment.** This will require a higher level of advocacy and leadership, better financing arrangements, adequate institutional and organizational arrangements, and a sound M&E system. Recent developments demonstrate that the Ethiopian leadership is addressing population issues more forcefully. Several positive and important steps have been taken in recent years, such as funding for contraceptives (at least at the regional level) and the increase of the legal age of marriage. Donors' coordination has also somewhat improved. More data has become available, as exemplified by the Demographic and Health Survey 2005. However, additional work is necessary at regional and sub-regional levels, as well as enhanced coordination between participants and closer links between researchers and implementers, as the overall main challenge is to expand family planning services.

## CHAPTER 11. TOWARD A RAPID INCREASE IN FAMILY PLANNING SERVICES

11.1 **In addition to promoting gender equity more generically, concerted efforts to increase family planning services are needed to accelerate the fertility transition.** This chapter reviews the coverage of current family planning services, the reliability of the supply of contraceptives at the existing service delivery points, and the quality of the services provided. It also discusses potential avenues to accelerate progress along each of these dimensions emphasizing the importance of a more enabling policy environment in achieving such progress.

### 11.1 Benefits of Family Planning

11.2 **Family planning can play a crucial complementary role in reducing fertility.** Continued exposure to family planning during her childbearing age is expected to reduce a woman's total fertility by 0.5 to 1.5 children, yielding substantial additional welfare benefits.

11.3 **Family planning also brings major health benefits for mothers and their children.** First, the provision of family planning positively affects the reproductive health of women and can help reduce maternal mortality substantially, which is among the highest in the world in Ethiopia (high fertility rates and high risk pregnancies are among the key causes; see Mekonnen, 2005). Second, family planning can also decrease the infant mortality rate, especially among children of young mothers. The infants at greater risk of dying are those born to women before or past their prime childbearing years and those born too soon after a previous birth (rule of too early, too late, too poorly spaced, and too frequent). According to DHS 2005 data, 29.8 percent of women aged 15-19 years and 35.2 percent of women aged 40-44 years reported an unmet demand for family planning services. Finally, societies with high infant mortality rates also have high fertility rates, in part because couples try to compensate for infant deaths.<sup>104</sup>

### 11.2 Demand for Family Planning Services

11.4 **Unmet needs for family planning among married women are still great as 34 percent of all Ethiopian married women have expressed an interest in 2005 (as compared with 36 percent in 2000).** The total demand for family planning among married women is 48.7 percent (DHS 2005): 14.7 percent of married women are already using a modern family planning method and 34 percent have unmet needs. In other words, five married women in ten would currently like to use a family planning method, but only one and a half married woman actually use one. There has been a slight increase in demand among married women since 2000 (from 43.8 to 48.7 percent). While not all stated demand for contraceptives would necessarily translate to use, this still represents a significant market. In the long run, the Government of Ethiopia will certainly need to address the demand for contraceptives. However, in the short run, significant increases in the contraceptive prevalence rate (CPR) could be attained by addressing existing unmet demand.

---

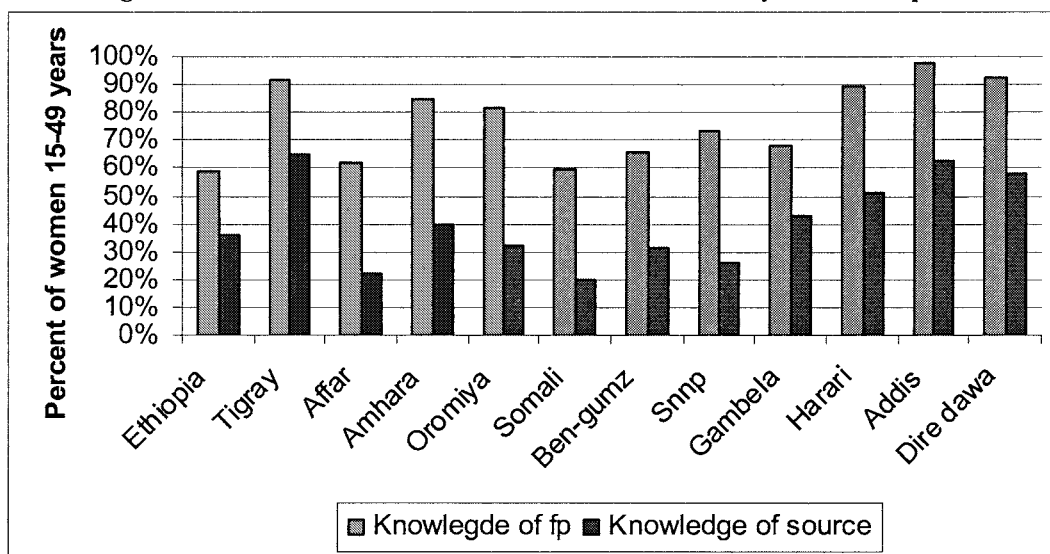
<sup>104</sup> Alan Guttmacher Institute (2002).

11.5 **The growing use of family planning methods has barely kept up with the increasing demand.** While the overall CPR increased by 6.6 percent from 8.1 to 14.7 percent between 2000 and 2005, demand increased by 4.9 percent from 43.8 to 48.7 percent. Anecdotal information shows that women living in rural areas sometimes walk great distances (up to two days one way) to obtain family planning services (such as an injectable contraceptive that will protect them for three months). Indeed, contraceptive prevalence rates more than doubled in rural areas between 2000 and 2005. Given the existence of sizeable unmet demand, the focus in this chapter is on the barriers of access, namely supply and quality. Nonetheless, continuing analysis of the cultural and normative settings will be needed to understand the remaining demand-related barriers in adopting contraceptives.

### 11.3 Access to Family Planning Services

11.6 **The lack of access to information leaves potential family planning clients vulnerable to misinformation and denies them access to health services.** The Ethiopia DHS 2005 survey showed that 80 percent of women and 64 percent of men have no exposure to mass media. A substantial disconnect exists between women who have heard of family planning and women who knew where to get it, indicating both lack of awareness and supply (Figure 11.1). While there has been some improvement over recent years, a substantial gap persists (JSI/DELIVER, 2004).

Figure 11.1: Disconnect between Awareness and Accessibility of Contraceptives



Source: DHS 2000.

11.7 **Geographical access to health and family planning services is still limited.** In 2000, households lived on average 7.7 km or 1.5 hours walking distance from the closest health facility (hospital, health center, clinic, or health post) (Table 11.1). While the distance declined between 1995 and 2000, and is likely to have further declined over the past years, geographical access to health services in Ethiopia is one of the lowest in the world (World Bank, 2004). Around 30 percent of households live beyond 10 km of the nearest health center. Access is, however, much better in urban areas than in rural areas where the average distance was reported

in 2000 to be 1.4 versus 8.8 km, respectively. Similarly, according to Pathfinder International Ethiopia (2004), more than two thirds of contraceptive users in urban areas are within 30 minutes of a contraceptive supply source. The rich tend to live closer to health facilities than the poor (though this partly reflects urbanization as people in urban areas tend to be richer). Regional differences are also very significant, ranging from as little as 1.3 km in Addis Ababa to 9.8 km in Afar. Nonetheless, 15 and 16 percent of rural users in the Amhara and Oromiya regions traveled more than two hours to reach a source of delivery (Pathfinder International Ethiopia, 2004). There was also a variance by method with condom users taking less time on average (10 minutes) to reach their source while users of the pill and injectable contraceptives took about half an hour.

**Table 11.1: Average Distances to Hospitals/Health Centers/Health Clinics (km)**

	1995		2000	
	Mean	Std. Dev.	Mean	Std. Dev.
<b>Total</b>	<b>8.8</b>	<b>9.3</b>	<b>7.7</b>	<b>8.1</b>
<b>Region</b>				
Tigray	10.7	10.6	7.6	6.7
Afar	5.1	9.2	9.8	13.1
Amhara	9.2	9.6	8.0	7.0
Oromiya	8.7	8.6	8.3	8.6
Somali	7.6	7.8	6.4	10.0
Benshangul/Gumuz	9.6	8.3	9.6	15.0
SNNPR	9.3	9.6	7.6	8.2
Gambella	5.7	8.1	6.9	8.8
Harari	2.1	2.6	2.2	2.8
Addis Ababa	0.9	3.6	1.3	4.7
<b>Urban rural</b>				
Rural	10.2	9.3	8.8	8.2
Urban	0.9	2.3	1.4	3.4
<b>Income Quintiles</b>				
Poorest	10	10	8.5	9.5
2nd poorest	10.1	10.2	8.1	8
Middle	9.2	9.4	7.6	7.5
2nd richest	8.7	8.8	7.5	7.6
Richest	7.0	8.0	6.1	7.4

Source: Welfare Monitoring Surveys (WMS) 1995 and 2000.

**11.8 The more remote and rural the area, the less access to family planning services and supplies and the lower the use of contraceptives.** Not surprisingly, family planning use rates are higher among the less remote communities. Indeed, a decline in the average distance to family planning services (in minutes) goes hand in hand with an increase in the percentage of current users, suggesting that use increases as the services become more easily available. Also, among the sample of 157 Peasant Associations (PAs/*kebeles*) in the Pathfinder Survey 2004 (Table 11.2), the few that had no current users were predominantly rural; urban areas were found to have higher contraceptive prevalence levels. They were also less likely to have markets and tended to be further away from towns. While one cannot conclude from this bivariate evidence that expansion into more remote areas would automatically increase contraceptive use, it is nonetheless suggestive and consistent with the findings in Part II. The Government has already

taken action to decrease the physical distance to health services. In addition to rehabilitating existing health facilities, an additional 25 hospitals, 230 health centers, and 1,222 new health posts have been built since the mid-1990s. However, the focus of the Government under the HSDP II) was to slow down the construction during the period of 2002 – 2005 and redirect its efforts on improving the quality of health care.

**Table 11.2: Characteristics of PAs/kebeles by percent of Family Planning Users in the PA/kebele**

% of current users in the PA/kebele 2003/04	Number of PAs/kebeles	Average minutes to Family Planning Service (among users)	% rural	% with market	Mean distance to a town
0	11	n.a.	91	18	12
1-15	52	61.7	87	33	14
16-29	46	44.2	50	48	8
30-62	48	34.3	50	50	9

Source: Pathfinder Survey 2004.

Note: Current use rates are computed from the Pathfinder Survey in Amhara, Oromiya, SNNPR, and Tigray. Other PAs/kebeles characteristics are calculated from census data. Numbers are population weighted.

**11.9 Young people have limited access to reproductive health services, especially the rural adolescent.** The medium age for the first sexual intercourse is between the ages of 14-16. Among women who are sexually active, a sizeable proportion reported knowledge about family planning but most also reported not using contraception (Govindasamy et al., 2002). A study conducted in 1989 showed that the majority (67.2 percent) of those seeking treatment for incomplete abortions were less than 24 years old. HIV is also highest among the 15-24 year olds, indicating that young people are sexually active and at risk. In addition to the general barriers faced by everybody in accessing family planning services such as information and geographic access, young people also face the additional barrier of negative health provider attitudes and lack of adolescent-friendly health services. Studies on adolescent health have shown that adolescents, especially those unmarried, are less likely to access health services from the public sector. Pathfinder International Ethiopia (PIE) and other NGOs have programs in place to improve access of RH services to young people. These include educating the gatekeepers (trained medical personnel, teachers, and religious leaders), peer to peer education, creating adolescent-friendly health services, increasing information, education and communication (IEC), and behavior change communication among the target group. Currently, no rigorous studies are available to determine the success of these interventions.

**11.10 Lack of convergence between HIV/AIDS, reproductive health, family planning, and MCH programs presents many missed opportunities to increase access to comprehensive services.** Addressing HIV/AIDS services in family planning, maternal and child health programs, and including family planning in HIV/AIDS programs, offer a broader outreach to underserved groups such as youth and men. Interventions within communities and health facilities can provide a comprehensive range of services in one visit, promoting client satisfaction, efficiency, and effectiveness and maximizing the utilization of scarce operational and financial resources.

**11.11 The public sector is the leading FP service provider, but reaches less than half of the population.** Seventy-eight percent of women currently using modern contraceptives get them from the public sector (Getahun and Eshete, 2003). But less than half have access to clinical services, especially in the rural areas. Second, the public sector is facing many problems including erratic availability of supplies, limited method-mix and service outlets, poor quality of services, and an exodus of trained manpower. High quality and consistent service are paramount for a successful family planning program. Therefore, in addition to the deployment of Health Extension Workers (HEWs), alternate approaches to service expansion using the private sector, NGOs, and Community-Based Reproductive Health Agents (CBRHAs) will be need in order to complement public service delivery and may need to be scaled up nationally.

**11.12 Improving access through the use of community-based agents has shown promise and needs to be sustained.** The concerted effort of both the Government and NGOs to increase family planning services through the use of CBRHAs has led to a rapid expansion of the program. The Pathfinder Survey 2004 found that the speed at which the provision of FP services have expanded is impressive (from 17 percent of Peasant Associations with FP services in 1992 to 87 percent in 2004<sup>105</sup>). Reports also show that the CPR is more than 40 percent in certain zones where the NGOs are providing FP services mainly through a community-based distribution (CBD) approach (Box 11.1). CBRHAs are responsible for disseminating family planning and other reproductive health information, and also for providing pills and condoms to clients through house-to-house visits. However, worldwide experience regarding community-based distribution programs is mixed. In Ethiopia, it may serve as an answer as poor access to health services requires a need for an agile and rapid method of bringing health services closer to the communities and clients. In addition, CBRHAs might create a positive synergy with the Health Extension Workers (HEWs) that have also been deployed.

**11.13 CBRHAs serve as a conduit between the community and the health facility, referring clients in need to clinical methods.** CBRHAs programs have referral and backup support from public health facilities and NGO-funded clinics. In fact, the Government has already seen the importance of involving these agents in extending health services to the community and has expanded their role giving them responsibility for providing a package of preventive services targeted to households, especially women/mothers (Box 11.1).

---

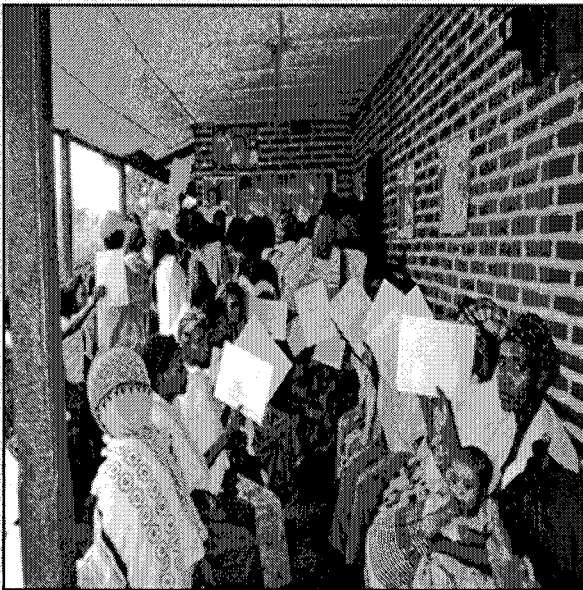
<sup>105</sup> However, the Pathfinder Survey 2004 is likely to have over-sampled areas with family planning (FP) activities and should not be taken to be necessarily representative of the rest of the country.

**Box 11.1: The Success of Community-Based Reproductive Health Agents (CBRHAs)**

Increasingly, alternative methods for promoting family planning among underserved and hard to reach populations have shown encouraging results. Pathfinder International Ethiopia (PIE) has recently begun community-based reproductive health projects in villages throughout the Amhara and Tigray regions. PIE trains members of Early Marriage Committees and CBRHAs to disseminate information, distribute contraceptives, and counsel women on maternal and child care in their homes, marketplaces, and neighborhoods. Marketplace agents in particular have been quite successful. They not only engage women when they come into market once a week, but also reach men and youth who frequent the marketplace to trade goods and exchange news.

Today, 110 *Woreda* Advisory Committees (WAC) promote family planning in Amhara, Oromiya, SNNPR, and Tigray regions. According to Tsedeke Wadebo, head of the African Humanitarian Action, 38.1 percent of women in his *woreda* now use contraceptives whereas only 2.6 percent used contraceptives in 2001. With increasing knowledge about family planning methods, demand for contraceptives is rising. An increasing number of women travel long distances, in some cases walking as long as four days (return trip) every three months to receive Norplant injections. Tsedeke says that “this progress represents a major behavioral change among community members.”

These women (see photo below) waited in line to receive long-term family planning services during a 7-day training session on Norplant and IUD insertion and removal. The training took place in the town of Nekemte in the West Oromiya Region and was organized by Pathfinder, major partner Ethiopian Evangelical Church Mekane Yesus/Central Synod, as well as the Oromiya Development Association and the Oromiya Regional Health Bureau.



*Marketplace FP/RH Agent Yeshi Alem (see photo above), Kemissie village, member of early marriage committee, WAC, and women’s association member, has prevented more than 300 early marriages in her community: “I teach from experience. I know the hardships of raising many children ... my husband now sees the benefits of what I started eight years ago, even though he was not convinced of it then.”*

Sources: Pathfinder International Ethiopia (2006c, 2006d).

11.14 **While the CBRHAs program shows promise, a more rigorous evaluation is advised.** The few available studies evaluating the impact of the CBRHAs program on contraceptive use in Ethiopia tend to overestimate the effect of the programs, even though they

have likely increased contraceptive access, especially in remote areas. Nationally, two studies were conducted in 2001 and 2003. Rapid surveys were conducted in eight Pathfinder-supported areas, and in USAID-funded areas in the five big regions (Addis Ababa, Amhara, SNNPR, Oromiya, and Tigray). Both surveys were compared to the DHS 2000 results and both studies showed considerable increases in contraceptive prevalence rates, usually two to five times higher in the areas where women reported having been contacted by CBRHAs, than in areas where they were not contacted or had not been contacted during the previous year (Pathfinder International Ethiopia, 2004). Other studies that focused on specific areas like the Family Guidance Association of Ethiopia (FGAE) survey which looked at Jimma, Oromiya, Yirgalem, and SNNPR showed that women's knowledge of FP increased from 36.9 percent in 1992 to 76.9 percent in 1994 (Korra, 2002). Given the difficulties in teasing out the net effect of any program due to placement effects, or the net effect of the CBRHAs on fertility, it is strongly advised to put in place more rigorous evaluation schemes of these interventions.

**11.15 Sustainability of community-based programs continues to be a challenge and requires financial and human resource innovations.** Almost all CBRHAs programs heavily depend upon international donor agencies. For instance, the withdrawal of one of the development partners from funding one of the biggest community-based programs in the absence of a phase-out plan signals the frailty of such programs in the country. Assessment of the CBRHAs program revealed that most programs do not have income-generating activities and phase-out plans (Ministry of Health – Family Planning Department, 2004, 2005). Charging a fee for service is a strategy for some programs although clients are reluctant to pay for service mainly because of their limited funds. On the other hand, community-based agents appeared less motivated to continue to render services without some type of incentive or reward. Sustained continuation of volunteer-based programs face challenges all over the world. If CBRHAs are truly bringing health services closer to the community, the financial costs of such an initiative need to be evaluated in comparison with expanding health facilities. A policy environment that is conducive and embraces the efforts of the CBRHAs is also critical.

**11.16 NGOs are instrumental in expanding the availability of contraceptives and family planning services and need to continue to complement public sector efforts.** While most of the family planning activities are now located in public health facilities, family planning activities in Ethiopia were originated by NGOs, the Family Guidance Association of Ethiopia (FGAE) being the first in 1966. The most prominent NGOs are FGAE, Marie Stopes International Ethiopia (MSIE), and Pathfinder. They play an active role in piloting innovative programs such as CBD, or focusing their services to vulnerable groups such as adolescents and rural women. Overall, there are 80 NGOs working in FP/RH services (source: WHO Ethiopia).

**11.17 The private sector, though still at a rudimentary stage, can play an important role in the provision of FP services, especially in urban areas.**<sup>106</sup> Prior to 1995, there was no legal framework within which the private sector could operate. Though the sector has expanded since, there are no coherent policy guidelines or implementation strategies that exist to effectively align private health facilities with Ethiopia's national population policy targets.

---

<sup>106</sup> For a study on private sector contraceptives' supply in another Anglophone sub-Saharan African country, see NCAPD (2004).



Private sector services are mostly inaccessible to families in rural areas as the majority of private health facilities are in urban areas. For example in Addis Ababa, 27 percent of all the private clinics as well as 50 percent of all the hospitals are privately owned (World Bank, 2004). According to the DHS 2005 survey, about 20 percent of contraceptive users obtained their supplies from the private sector, though overall, it currently plays a very minor role in the provision of family planning services. Hospitals also play a limited role in providing long-term clinical contraceptive methods. The potential of a commercial sector market is significant for Ethiopia, but this requires a more enabling business environment. A strategy to enhance private sector investment has been developed. However, increasing contraceptive distribution through the private sector will require a change in behavior by the Government, the donors, and the private sector itself. Since the exponential need for contraceptives into the future cannot be sustained by the public sector and/or social marketing programs alone and as long as subsidized contraceptives continue to be available for everybody through the public sector, the private sector will not grow in this area (Deye, 2005).

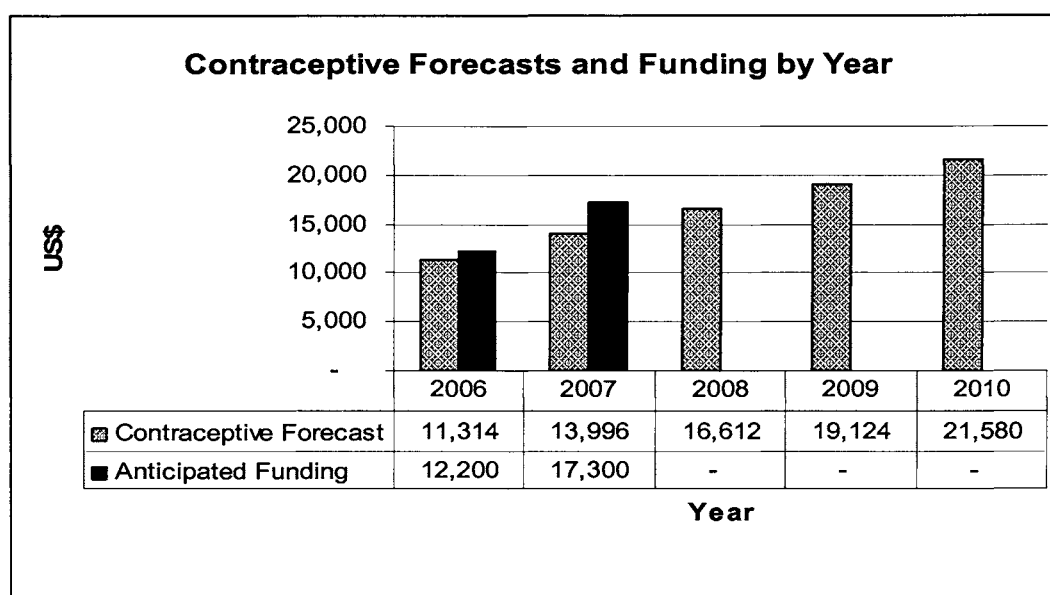
**11.18 Taxation of contraceptives and cumbersome customs clearance procedures were another barrier to private sector engagement in the provision of family planning services, but taxes on contraceptives have been removed in May 2007.** Tax policy in Ethiopia requires that duties be paid on all imported items, regardless of what is imported or who imports them. The MOH used to pay the tax for donor-funded contraceptives, which is a fixed rate of 15 percent, though actual practice showed a variation from year to year of 9 to 27 percent (Getahun and Eshete, 2003). However, the MOH does not cover the import taxes for all non-profit organizations and almost never does for the commercial sector. However, taxes on contraceptives were removed in May 2007, which is major step forward to make contraceptives more readily available. Second, the process of customs clearance is complex and time-consuming, adding considerable lag time between the arrival of the goods at the port of entry and the time they reach delivery sites. This inefficiency had increased the need for additional safety stock and hence more money tied to inventory carrying costs. Finally, according to Getahun and Eshete (2003), the amount that could be saved from not paying taxes could be used in the program. This would generate additional couple year protection (CYPs)—potentially decreasing the 36 percent unmet need reported in the DHS 2000 to 30 percent.

**11.19 Commercial Social Marketing (CSM) approaches are an important channel of contraceptive distribution, especially of short-term methods in urban markets for fee-paying clients.** Social marketing programs are important to increase access to contraceptive methods through non-health facility distribution points, such as pharmacies and shops. In Ethiopia, the local branch of the social marketing company DKT International sells three short-term methods at subsidized rates: condoms, Depo Provera, and combined oral contraceptives. Currently, the program accounts for 90 percent of all condoms distributed in the country. Access and promotion of condoms is especially critical to prevent the spread of HIV/AIDS. In addition to increasing access, commercial social marketing plays a key role in increasing the information, communication, and education (IEC) of its brand products and for overall family planning services through mass media efforts (this is important as more Ethiopians need to receive health-related information). In a country where discretionary income among most of the population is limited, there is a need for subsidized contraceptives and easy access without visiting a health facility. The country can also benefit from generic promotional and advertising efforts of CSM which can help the overall market grow.

## 11.4 Increasing the Availability of Contraceptives

11.20 **Continuous availability of contraceptives is a key challenge to the expansion of family planning programs.** While the previous section emphasized the need to increase geographic and youth access to family planning services by improving the public-private mix, the actual availability of a variety of contraceptives at the delivery points needs also to be substantially strengthened. The contraceptive and logistic systems survey (Ministry of Health, 2004a, 2004b) revealed that in many facilities contraceptives were often out of stock (Ahmed and Mengistu, 2002). The urban centers fared slightly better than those in remote areas. Ensuring continuous availability of contraceptive is a major challenge when financing is erratic and logistics systems are weak.

Figure 11.2: Contraceptive Forecasts and Funding Requirements



Source: Ministry of Health – Family Planning Department (2005).

11.21 **Financing may be adequate if all commitments are met for the near-term; however, the situation beyond 2007 looked bleak at the time.** After intensive donors' coordination, a pledge from several donors, NGOs, and the private sector has been received that will adequately cover funding for 2006 and 2007 (Figure 11.2). However, no funding was committed beyond 2007. In addition, ensuring the pledges are paid in a timely manner requires time-consuming, continuous, and dedicated follow-up. This is hard to accomplish, given the limited human resources of the reproductive health unit at the MOH. The financing, however, would be hugely inadequate if the funding for contraceptives for unmet needs was also considered. Based on the DHS 2005 data, US\$14.6 million per year of additional funding would be required to meet the unmet needs (including safety stocks).

11.22 **While contributions from the public sector budget are important, donors' and external funding will also need to continue for the procurement of contraceptives in the future.** The Government of Ethiopia increased its funding for pharmaceutical services in

2003/04 to approximately US\$49.3 million<sup>107</sup> and US\$53.2 million in 2004/05 (World Bank, 2004). Yet, the funding required to meet the actual need for contraceptives alone for the same period was US\$10.4 million and US\$8.02 million,<sup>108</sup> respectively, of which half was unfunded. This means that a sizeable portion of the budget would be needed just to support *one program*, not taking into account all the other pharmaceutical requirements for other curative and preventative programs.

**11.23 The country is in a continuous crisis mode due to lack of predictable, multi-year financing.** Historically, USAID, UNFPA, and other development partners like the EU, the German Funding Agency for International Development (KfW), and DFID (Ministry of Health, 2004a, 2004b) have been the main donors of contraceptives. However, their contributions are barely keeping up with the growing needs. In addition, if the pledges are received late, or if there are extended delays in executing contracts due to internal Government's or donors' bureaucracy, there may not be funds available to replenish out of stock supplies. As a result, emergency funding for contraceptives is often needed as exemplified in the recent bail-out by UNFPA. The Government is taking steps to establish a Health Commodity Fund that will ensure predictable and multi-year financing for a set of essential health products, including contraceptives. To be effective, funding and procurement cycles must be separated, so that the procurement process is not slowed down by the disbursement cycles.

**11.24 The current logistics systems are weak and cumbersome, but promising efforts are underway to make them more effective.** The current systems are marred with problems including lack of strategic planning of the supply-chain, fragmented procurement, a lengthy pipeline with numerous intermediate storage points, weak transportation system, lack of skilled labor, and lack of information systems to inform forecasts and prepare orders (Logistics Masterplan Team for Ethiopia, 2006) – all of which lead to additional inventories and thus additional financing to compensate the shortfalls of the system and ensure continuous availability. A detailed assessment by the JSI/DELIVER Project found that the contraceptive logistics system was far from functioning adequately, resulting in out of stock supplies and poor distribution. Regions were neither consulted on the design of the logistics systems nor on the coordination for the ordering and receiving of donated contraceptives, and these factors are in part responsible for stocks being out of supply in facilities. Warehouses at central, regional, and zonal levels are poorly organized lacking basic warehouse technologies, e.g. racking shelves, materials handling equipment, computers, etc., resulting in overstocking of some products and undersupply of others (JSI/DELIVER, 2003). Inefficiencies in the systems were due in part to the fact that logistics activities were not adequately funded through public sector budgets and almost never funded by donors providing the contraceptives, who in effect assumed it to be a governmental responsibility.

**11.25 The Government and partners have embarked on reengineering the logistics system design after a year of learning the implementation of best practices and have come up with a consolidated, streamlined supply-chain that is estimated to yield a 165 percent return on investment in five years.** The new logistics system operating costs are estimated to be 18 percent of throughput over the five year period (Logistics Masterplan Team for Ethiopia, 2006).

---

<sup>107</sup> Exchange rate used of US\$1 to 8.7350 Birr as of May 23, 2006.

<sup>108</sup> These figures include nine months of safety stocks.

By comparison, currently many healthcare logistics systems in developed and developing countries cost as high as 45 percent of the cost of goods sold.

### 11.5 Improving the Quality of Family Planning Services

11.26 **Short-term methods dominate the method-mix in Ethiopia, with 85 percent of users using either pills or injectable contraceptives.** A key component to assuring quality family planning services is providing a wide range of choice (this is called the method-mix). It is widely held that most women in Ethiopia prefer injectable contraceptives to other methods because of their convenience, as they are taken as a single shot and provide protection for three months. In fact, between 2000 and 2005 the share of currently married women using injectable contraceptives increased from 49 to 72 percent, while the share of pill users halved from 40 to 21 percent (Table 11.3). Being in control of the method without the need for consent from their husbands is another reason for the popularity of injectable contraceptives. Deterrents to the use of long-term methods such as intra-uterine devices (IUD) include inadequate information about the method, lack of access, and unfounded rumors about its possible side effects (Pathfinder International Ethiopia, 2003).

**Table 11.3: Distribution of Method-Mix between the two DHS Surveys among all Married Women**

Method	2000	2005
Female Sterilization	5%	2%
IUD	2%	2%
Implants	0%	1%
Pills	40%	21%
Injectable contraceptives	49%	72%
Condoms	5%	1%

Sources: DHS 2000 and 2005.

11.27 **A shortage of trained personnel puts significant constraints on the quality of health care and limits the potential to expand family planning services in Ethiopia.** With 25,958 people per doctor, Ethiopia has one of the worst person-per-doctor ratios in the world.<sup>109</sup> There are 4,882 people per nurse (World Bank, 2004). These ratios are substantially worse in rural areas where the majority of the population resides.

11.28 **Four issues deserve further attention to remedy this situation:**<sup>110</sup> 1) revision of the regulations enabling public sector employees to work both in the private and public sectors; 2) inclusion of preferences of health workers in post assignments; 3) improved monitoring of work performance; and 4) increased training of personnel on how to deal with HIV/AIDS risks. First, the current regulations do not consider the presence of the private sector. A good example is the lack of regulation concerning combining public and private sectors work. Although often not allowed, health workers combine public with private health work, which often leads to lower quality public service due to absence and/or fatigue. Secondly, current human resource policies do not take health worker preferences into account in the assignment of their posts. Health workers are assigned through a lottery system. However, when willingness to work in a rural

<sup>109</sup> The WHO standard is 1 doctor per 10,000 people.

<sup>110</sup> Lindelow and Serneels (2006).

area is heterogeneous,<sup>111</sup> an assignment system which allows health workers to choose to work in a rural area if they want to could possibly be more effective in reaching a higher rural coverage. Thirdly, health workers are not held accountable for the quality of their work. In the absence of work performance monitoring and inspection systems, inappropriate and corrupt behavior (like rudeness toward patients, absenteeism, or asking for bribes), goes uncorrected. Finally, there is no clear procedures/advice on how health workers can/should deal with the risk of HIV/AIDS infection. Poor safety procedures combined with the lack of protective material and the high workload steers health workers to public health activities. At the same time, new candidates seem deterred to take up the profession. Addressing these four areas in human resource policies could substantially help reduce human resource constraints in providing quality health care and family planning.

## 11.6 The Way Forward

11.29 **New strategies have been designed to tackle reproductive health (RH) as well as the needs of adolescents and youth.** In 2006, the Ministry of Health (MOH) prepared a National Reproductive Health Strategy for the period 2006-2015 (Ministry of Health, 2006a). This comprehensive document covers six priority areas, namely: the social and cultural determinants of women's RH; fertility and family planning; maternal and newborn health; HIV/AIDS; RH of young people; and reproductive organ cancers. The strategy examines these six priority areas at three different levels of interventions, i.e. *“the ‘community’, which comprises the broader social and cultural context of each health issue; the ‘system’, which looks at opportunities arising from the delivery of health care services; and ‘policy’, which examines the institutional and normative frameworks within which decisions are made.”* The National Reproductive Health Strategy was complemented in 2007 by a specific document addressing the RH rights and needs of adolescents and youth (Ministry of Health, 2007). This latter strategy delineates for the next 10 years four major goals geared at the segment of the population aged 10-24, i.e. to increase access and quality of RH services; to increase awareness and knowledge; to strengthen multi-sectoral partnerships and create an enabling positive environment at all levels; and to design and implement innovative and evidence-based programs.

11.30 **In addition, the MOH has launched an ambitious Health Service Extension Program (HSEP) that intends to deploy 30,000 Health Extension Workers (HEWs) in the country** (Mengistu, 2007). The HSEP is composed of 16 different essential packages of health service under 4 major program areas, i.e. family health services; disease prevention and control; hygiene and environmental health; and health education and communication. The program, which comes in addition to the CBRHAs program, assigns two health extension workers (HEWs) to provide overall primary health care services, including family planning and other reproductive health services, to each *kebele* (community level with a population of about 5,000). The HEWs are recruited from the community and trained for one year in ad hoc training centers. The HSEP program is expected to be fully operational in 2008.

11.31 **These outreach efforts in the area of reproductive health and family planning will be complemented by the ongoing GoE Universal Access Program, which intends to**

---

<sup>111</sup> Serneels, Garcia-Montalvo, Lindelow, and Barr (2005).

provide electricity, telephone, schools, health posts, and other services (e.g. safe water supply) to all regions of Ethiopia. In addition, it is expected that the universal primary education program will go beyond Grade 4 and cover all Ethiopians through Grade 8. Therefore, efforts in the area of RH and family planning are meant to be complemented and enhanced through several other multi-sectoral interventions aimed at scaling up the delivery of basic services.

**11.32 Expanding family planning programs will assist in reducing fertility and capturing the demographic bonus. However, this will require that the specific issues of access, supply, and quality of FP are adequately addressed, as follows:**

- *On the demand-side, increase information, education, and communication (IEC) as well as behavior change communication (BCC) programs to help boost the use of contraception.* In addition to support from commercial social marketing programs and NGOs, a concerted multi-media approach is needed in promoting family planning programs. Additional research is further required to better understand individual and societal influences as well as male involvement on fertility and family planning decisions, with a particular emphasis on the barriers to the use of long-term family planning methods.
- *On the supply-side, expand the coverage of family planning services to remote rural areas.* The closer family planning service centers are, the more likely it is that women will increase their use of contraceptives. As mentioned, the MOH began recently the process of deploying HEWs to communities and households throughout the country (World Bank, 2004; Mengistu, 2007), in addition to the Community-Based Reproductive Health Agents (CBRHAs). There is great hope that this approach will increase the coverage and use of family planning services in the country. A monitoring and evaluation program of the effectiveness of the outreach activities by HEWs as well as CBRHAs, should be simultaneously implemented.
- *Improve the infrastructure of health facilities and, engage the private sector and NGOs in improving family planning services in Ethiopia.* While construction of new health care facilities, particularly health posts, is underway, it is necessary to recognize, engage, and include the NGOs and other private providers as partners to help fortify and expand family planning activities. These partners can assist in: a) the social mobilization for family planning; b) the development of innovative ways to reach hard-to-reach clients; and c) addressing the access and availability issues of long-term methods as well as providing support to total quality management initiatives.
- *Initiate long-term planning for financing of contraceptives.* This pertains both to the sustainability of the financing as well as the sustainability of the distribution system. Given the fluctuations in external financing, the Government's plan to implement a health commodity fund would ensure a more predictable and multi-year source of funding. In addition, this fund should also help in separating the procurement and financing processes and serve as a pledge mechanism for future orders, which, if not separated, tend to cause delays and eventually out-of-stock supplies. However, given the current budget for the total pharmaceutical package versus the massive financing needs for contraceptives alone, there is a need for the MOH to segment the market (according to

the ability to pay) and focus its efforts on serving only those who need public sector assistance. In addition, commercial social marketing and NGO initiatives can be supported in reaching out to young people.

- *Use the current focus on HIV/AIDS to improve the overall comprehensive package of reproductive health services.* This requires better coordination and harmonization of integrated services and protocols at the operational level.
- *Accelerate the implementation of the new supply-chain system.* Clearly, the efficiency of the new system, once implemented, will improve the availability of contraceptives at service delivery sites.
- *Improve the quality of family planning services, both in terms of human resource constraints and staff attitudes.* To reduce human resource constraints in the health sectors, the rules governing the combination of jobs in the public and private sectors should be clarified, individual preferences in the assignment of posts should be taken into account, performance-based management of health workers should be introduced, and HIV/AIDS infection as a professional risk should be properly addressed. In partnership with NGOs, reorientation of staff skills and attitudes in family planning service provision needs also to be addressed.
- *Implement a strong monitoring and evaluation system.* Key issues of access, supply, and quality need to be continually monitored. There is also a need for a new matrix at all levels of the system to ensure that operational bottlenecks are continually monitored. Civil society and communities need to work together in monitoring and ensuring that the Government is accountable to the promises made to increase family planning services.

## CHAPTER 12. CONCLUDING REMARKS

12.1 **More than a decade after launching the National Population Policy (NPP), its implementation has been rather modest. Much more needs to be done to reach the NPP targets and the MDGs.** Chapter 9 highlighted the importance of promoting equitable overall development, especially the need to improve the status of women. Fostering female education and enhancing female participation in the labor force were cited as critical entry points to empower women and accelerate the fertility transition. This is illustrated by the experience from Indonesia (Box 12.1).

### Box 12.1: The Case of Indonesia

As the fourth most populous country in the world, the Government of Indonesia established the Family Planning Coordinating Board (*Badan Koordinasi Keluarga Berencana Nasional*, known as BKKBN) in 1970 to coordinate the activities of several ministries, local governments, and volunteers. Its objective was to promote the two-child family norm by encouraging women to delay marriage and take contraceptive measures. The BKKBN focused its efforts on two important institutional factors: 1) developing strong local political support through community involvement in family planning; and 2) improving the economic welfare of women by rapidly expanding the reach of the educational system.

Activities such as creating demand for contraceptive services and promoting information, education, and communication (IEC) campaigns on family planning services by community organizations, local volunteers, medical professionals, and mobile clinics were first introduced in densely populated areas. Next, distribution networks expanded and training of health professionals increased. Services were tailored to local needs. Contraceptive subsidies were also offered to induce demand.

Integrating demographic and economic approaches led to an increase in the contraceptive prevalence rate from 27 percent in 1980 to 47 percent in 1987. Commensurately, the total fertility rate decreased from 5.6 percent in 1970 to 3.2 percent in 1985 and the mean age at marriage rose from 19.3 to 21.1 years between 1971 and 1985.

The contributions of family planning programs, economic development, and women's status to the Indonesian fertility decline that occurred between 1982 and 1987 were examined in a 1994 study conducted by Gertler and Molyneaux. They found that although 75 percent of the fertility decline was attributable to increases in contraceptive use, 87 percent of such increases were due to improvements in female education and wages for female workers. In fact, 65 percent of the fertility decline was attributable to education and economic impacts working strictly through increases in contraceptive use, whereas changes in family planning program inputs accounted for only 4 to 8 percent of the decline (Gertler and Molyneaux, 1994: 60). At the start of the period of analysis, family planning facilities and services were already extensive. However, by the mid-1980s the BKKBN had organized an effective network of providers well-trained in delivering family planning services. The remarkable impact of overall economic development in increasing the use of contraceptive measures could not have occurred had the supply of such services been constrained.

Source: Gertler and Molyneaux (1994).

12.2 **Chapter 10 discussed the bottlenecks hindering the implementation of the NPP and identified four necessary prerequisites to create a more enabling population policy environment.** They are: i) sustained Government's commitment; ii) better financing arrangements; iii) strong institutional and organizational settings; and iv) continuous and rigorous monitoring and information systems. The case of Bangladesh shows the synergies between these elements, in particular the implementation of a flexible and well thought out program guided by a strong demographic surveillance system (Box 12.2).



12.3 **Finally, Chapter 11 focused on expanding coverage and quality of family planning services.** Although Part II of the report demonstrated that overall development is quantitatively a more significant factor in bringing about increased contraceptive use, and therefore decreased fertility rates, expanding family planning services plays an important complementary role (May, 2005). Ensuring availability of contraceptives at existing distribution points, expanding service delivery to reach more remote rural areas, and including a wider range of contraceptive options all play a part in reducing fertility (Box 12.2). Overall, increased demand for contraceptives parallels development growth, a need the Government, local communities, and volunteers will have to meet.

**Box 12.2: The Case of Bangladesh**

In 1975, the Government of Bangladesh, recognizing the threat a rapidly growing population posed to the country's development, took important steps to lower their population growth rate. By complementing efforts to change traditional and cultural attitudes regarding family size and modern methods of contraception with the provision of a variety of family planning services through the Ministry of Health and Population Welfare, Bangladesh was able to bring about a significant decrease in fertility.

The program was characterized by five main elements: 1) The use of young, married, and trained women as outreach workers, referred to as female welfare assistants (FWAs) to provide contraceptive services and information to women in their homes; 2) The provision of a wide range of contraceptive methods; 3) The establishment of family planning clinics in rural areas to provide clinical contraceptive services to which FWAs could refer their clients for long term or permanent methods such as sterilization; and 4) IEC campaigns intended to provide information about contraceptive options and change norms about family size; 5) The presence of a high quality information system.

The efforts of the Matlab Health Research Center have been instrumental in shaping, and at times, reorienting Bangladesh's family planning program. The Matlab center tested new approaches to delivery of family planning services, combined outreach services and fixed sites for delivery of care, and provided of a wider variety of contraceptive methods.

The reach of FWAs was extensive. Virtually all Bangladeshi women received at least one home visit from a FWA and even a third of them had been contacted at home every six months. By 1991, almost all Bangladeshi women had some knowledge of modern methods of contraception. Contraceptive prevalence rate increased from 8 percent in 1975 to 49 percent in 1997. The Matlab center showed that the wide range of contraceptive methods was an important influence on the increase in overall use of contraceptives. More importantly, fertility declined from 6.3 to 3.3 births per woman between the early 1970s and the mid-1990s. Nevertheless, family programs can only partly account for the increase in contraceptive use. The status of women has gradually improved and primary and secondary school enrollment has increased by three and five times, respectively, between 1973 and 1996.

*Source: Levine and the What Works Working Group (2004).*

## APPENDICES

### Appendix A: Trends in Contraceptive Use in Selected Sub-Saharan Countries

Country	Year 1	Year 2	% of women in union aged 15-49 who are using contraception		Source	
			Year 1	Year 2	Year 1	Year 2
Benin	1996	2001	16.4	18.6	DHS	DHS
Botswana	1984	1988	27.8	33	NFS	DHS
Burkina Faso	1993	1999	7.9	11.9	DHS	DHS
Burkina Faso	1999	2003	11.9	13.8	DHS	DHS
Burundi	1987	-	8.7	-	DHS	-
Cameroon	1978	1991	2.4	16.1	WFS	DHS
Cameroon	1991	1998	16.1	19.3	DHS	DHS
Cameroon	1998	2004	19.3	26	DHS	DHS
CAR	1994/95	-	14.8	-	DHS	-
Chad	1996	-	4.1	-	DHS	-
Comoros	1996	-	21	-	DHS	-
Cote d'Ivoire	1981	1994	2.9	11.4	WFS	DHS
Cote d'Ivoire	1994	1999	11.4	15	DHS	DHS
Eritrea	1995	2002	8	8	DHS	DHS
Ethiopia	1990	2000	4.3	8.1	NF/FP/HS	DHS
Ethiopia	2000	2005	8.1	14.7	DHS	-
Gabon	2000	-	32.7	-	DHS	-
Ghana	1988	1993	12.9	20.3	DHS	DHS
Ghana	1993	1999	20.3	22	DHS	DHS
Ghana	1999	2003	22	25.2	DHS	DHS
Guinea	1993	1999	1.7	6.2	DHS	DHS
Kenya	1989	1993	26.9	32.7	DHS	DHS
Kenya	1993	1998	32.7	39	DHS	DHS
Kenya	1998	2003	39	39.3	DHS	DHS
Lesotho	1977	1992	5.3	23.2	WFS	DHS
Liberia	1986	-	6.4	-	DHS	-
Madagascar	1992	1997	16.7	19.4	DHS	DHS
Madagascar	2003/04	-	27.1	-	DHS	-
Malawi	1984	1992	6.9	13	NF/FP/HS	DHS
Malawi	1992	1996	13	21.9	NF/FP/HS	DHS
Malawi	1996	2000	21.9	30.6	DHS	DHS
Mali	1987	1996	4.7	6.7	DHS	DHS
Mali	1996	2001	6.7	8.1	DHS	DHS

Country	Year 1	Year 2	% of women in union aged 15-49 who are using contraception		Source	
			Year 1	Year 2	Year 1	Year 2
Mauritania	1981	1990	0.8	3.3	WFS	Arab/GF/CHS
Mauritania	1990	2000/01	3.3	8	DHS	Arab/GF/CHS
Mauritius	1985	1991	75.3	74.7	CPS	CPS
Mozambique	1997	2003	5.6	25.5	DHS	DHS
Namibia	1992	2000	28.9	43.7	DHS	DHS
Niger	1992	1998	4.4	8.2	DHS	DHS
Nigeria	1982	1990	4.8	6	WFS	DHS
Nigeria	1990	1999	6	15.3	DHS	DHS
Nigeria	1999	2003	15.3	12.6	DHS	DHS
Rwanda	1983	1992	10.1	21.2	WFS	DHS
Rwanda	1992	2000	21.2	13.2	DHS	DHS
Senegal	1986	1993	11.3	7.4	DHS	DHS
Senegal	1993	1997	7.4	12.9	DHS	DHS
South Africa	1988	1998	49.7	56.3	RP/UNP	DHS
Sudan	1979	1990	4.6	8.7	WFS	DHS
Sudan	1990	1993	8.7	8.3	DHS	Arab/GF/CHS
Togo	1988	1998	12.1	23.5	DHS	DHS
Uganda	1989	1995	4.9	14.8	DHS	DHS
Tanzania	1992	1996	10.4	18.4	DHS	DHS
Tanzania	1996	1999	18.4	24.2	DHS	DHS
Uganda	1988	1995	4.9	14.8	DHS	DHS
Uganda	1995	2000	14.8	22.8	DHS	DHS
Zambia	1992	1996	15.2	25	DHS	DHS
Zambia	1996	2001	25	34.2	DHS	DHS
Zimbabwe	1989	1994	43.1	48.1	DHS	DHS
Zimbabwe	1994	1999	48.1	53.5	DHS	DHS

CHS: Child Health Survey

CPS: Contraceptive Prevalence Survey

DHS: Demographic and Health Survey

FP: Family Planning

GF: Gulf Family

HS: Health Survey

NF: National Fertility

NFS: National Fertility Sample Survey

RP: Research Paper / UNP: United Nations Publications

WFS: World Fertility Survey

## Appendix B: Descriptive Statistics of the Covariates of Fertility and Marital Status

Table B 1: Definitions and means of covariates of fertility and marital status

	Mean
	Women 15-49
<i>Household and woman's characteristics</i>	
Age 15-19*	0.241
Age 20-24*	0.186
Age 25-29*	0.168
Age 30-34*	0.120
Age 35-39*	0.112
Age 40-49*	0.173
Log [household consumption]: predicted value of household consumption per adult equivalent based on Ethiopia Household Income, Consumption, and Expenditure Survey 1999/2000 and asset indicators	7.124
No formal schooling*	0.752
Some primary*: up to 6 years of formal schooling	0.158
More than primary*: 7 or more years of formal schooling	0.090
Ever married*	0.760
Currently married*	0.637
Religion: Orthodox*	0.506
Religion: Muslim*	0.290
Religion: Other*	0.204
Rural*	0.819
<i>Community characteristics**</i>	
% of women with piped water source (inside or outside the dwelling)	0.177
Mean of predicted log household consumption	6.871
Exposure of men to FP: % of men who reported hearing a family planning message through the media	0.362
Women's knowledge of FP: % of women who know of a source for family planning	0.366
Mean years of female schooling	1.295
Mean years of male schooling	1.462
Child MR: mortality rate of children under 5 years	0.117
Women decide on money expenditures: % of women who report having some decision-making power in their household regarding cash expenditures	0.239
Women report that wife beating is justified: % of women who report that wife beating is justified for one of five reasons (DHS 2000)	0.845
Number of women	15,362

\* Indicates an indicator variable which is equal to 1 if true, else equal to 0.

\*\* Community characteristics are the average across the sample of women living in the same survey enumeration area, excluding the respondent.

Source: DHS 2000. All statistics are weighted.

## Appendix C: Description of Pathfinder Survey 2004

1. The Pathfinder Survey was conducted in September 2004 from the four most populated regions in Ethiopia (Amhara, Oromiya, SNNPR, and Tigray) and is described in more detail in Pathfinder International Ethiopia (2004). The objective was to provide information on the current level of knowledge, attitude, and practice of family planning. The survey used a stratified multi-stage sampling design with four regional states combined with urban-rural residence for each of the regions as strata to provide a representative sample. *Woredas* constituted the primary sampling units and a total of 58 *woredas* were sampled (consisting of 113 PAs and 63 *kebeles*). Weights are provided to make the sample representative at the national level, and are used for all descriptive and regression analyses.

2. Generally, the sampled women in the Pathfinder Survey 2004 are older than the women in the DHS (on average one year) and more likely to be married (71 percent in Pathfinder and 64 percent in the DHS 2000). The Pathfinder sample is also likely to have never attended school; this is the case for both at the primary and secondary levels. Perhaps most striking of the differences in the survey samples is the prevalent use of family planning. The Pathfinder women are also much more likely to be current users of any method of family planning, and more likely to have ever used contraception. Thirty eight percent of married women in the Pathfinder sample reported having used a method of family planning, compared to 24.1 percent of married women in the DHS 2005. Likewise, current use among married women in Pathfinder is much higher (27 percent) compared with 14.7 percent in the DHS 2005.

**Table C 1: Background Characteristics of Respondents**

	<b>Pathfinder: Tigray, Amhara, SNNPR, Oromiya</b>	<b>DHS 2005: National</b>	<b>DHS 2000: Tigray, Amhara, SNNPR, Oromiya</b>
<i>Age</i>			
15-19	17.5	23.2	24.0
20-24	17.5	18.1	18.6
25-29	20.4	17.9	16.7
30-34	14.9	12.8	12.0
35-39	13.6	11.4	11.1
40-44	9.2	8.4	9.2
45-49	7.0	8.1	8.4
<i>Marital Status</i>			
Married	71.0	63.4	64.2
Widowed	5.9	3.6	3.5
Divorced	6.5	6.9	6.2
Separated	1.6		2.5
Living together	0.5	1.1	0.9
Single (never married)	14.7	25.0	22.8
<i>Residence</i>			
Urban	12.7	17.8	13.6
Rural	87.3	82.2	86.4
<i>Region</i>			
Tigray	7.1	6.5	6.9
Amhara	30.9	24.7	27.3
Oromiya	36.6	35.6	42.4
SNNPR	25.3	21.3	23.4
<i>Education</i>			
No education	58.2	65.9	77.6

	<b>Pathfinder: Tigray, Amhara, SNNPR, Oromiya</b>	<b>DHS 2005: National</b>	<b>DHS 2000: Tigray, Amhara, SNNPR, Oromiya</b>
Primary	21.9	22.2	15.5
Secondary and above	19.9	11.9	6.9
<i>Religion</i>			
Orthodox	58.0	49.2	50.5
Catholic	4.2	1.2	1.1
Protestant	15.5	18.8	15.8
Muslim	20.3	28.5	29.0
Other	2.1	2.2	3.6
<i>Family Planning</i>			
Ever Use	31.8	18.2	12.0
Currently Use	21.0	10.3	5.1
<i>Family Planning Among Currently Married Women</i>			
Ever Use	37.8	24.1	14.7
Currently Use	27.2	14.7	6.9
Number of Women	3,672	14,070	7,821

*Source:* Pathfinder Survey 2004 and Central Statistical Authority (2005).

*Note:* All statistics are weighted. DHS 2005 results from the Preliminary Report. *n.a.* indicates that the statistic is not available in the DHS 2005 Preliminary Report.

## Appendix D: Methodological Considerations in Estimating the Effect of Family Planning

1. The econometric model we use can be thought of as a two-step model. We first estimate the decision whether to place a program P in area  $k$  and secondly the effect of the family planning program on the individual fertility decision  $y_{ik}$ . The system of equations is then:

$$P_k = X_k \alpha_1 + Z_k \alpha_2 + \nu_k$$
$$y_{ik} = X_k \beta_1 + X_i \beta_2 + P_k \beta_3 + \epsilon_{ik}$$

where  $X_k$  is a vector of exogenous variables that are area specific,  $Z_k$  is a set of area-specific exogenous variable that affect program placement but do not affect the individual fertility decision, the individual characteristics are captured by  $X_i$  and finally,  $P_k$  the presence of the program. Identification comes from variables that influence program placement, but which are unrelated to the individual fertility decision.

2. Relative characteristics of different areas are used as instruments to identify  $\beta_3$ , following Menon (2001). To fix ideas, one assumes that there are only two areas, A and B, and that these two areas compete for resources from the Government. While it is possible that the average education of women in area A affects fertility in area A, the average education of women in area B should not affect fertility in area A. Since the two areas compete for resources, it is likely that the relative distribution of education will affect the program placement decision. The Government could, for example, decide to place a family planning program in the area with the lowest average education. Hence, under certain assumptions, it is possible to use characteristics of areas as instruments. Examples of these would be the relative average education or the rank of average education. If the Government favors a specific ethnic group, one could use the size of this group relative to other areas.

3. One of the issues in determining the placement decision is how to deal with the fact that programs are introduced over a long period. A simple measure of exposure is the number of years a family planning program has been in operation in an area. The main problem with this measure is that it assumes a linear relation between exposure and fertility and that it will not capture the impact of, for example, having had a family planning program for five years on a women who is 20 as compared with another who is 40. Instead, given the relatively small data set available here, we focus on whether family planning services were offered by 1985 or before (EC).<sup>112</sup> The choice of 1985 is somewhat arbitrary, but the results are essentially the same for surrounding years.

4. For all *kebeles* and Peasant Associations (PAs), we have information on whether a health facility with family planning is available and if so, when it first offered family planning services. For PAs, we use the year family planning services were offered within 15 km of the PA<sup>113</sup>. For *kebeles* we use the year the closest health facility began offering family planning services, whether or not the health facility is located in the *kebele* or a neighboring *kebele*. The motivation for this difference is that *kebeles* are essentially districts of a town and identifying placement within a town is beyond the capability of our data and is also of less interest since most of these towns are small and travel within them is relatively easy<sup>114</sup>.

---

<sup>112</sup> This date in the Ethiopian calendar corresponds to 1992 in the Gregorian calendar.

<sup>113</sup> While arbitrary, this distance seems reasonable especially when using injections. Some studies in the literature have considered a family planning program present in a community when it is within 30 km.

<sup>114</sup> The maximum distance to the closest facility in the case where a *kebele* does not have family planning services but where another *kebele* within the town had, is 3.5 kilometers. For comparison, the maximum distance to the nearest facility in rural Peasant Associations (PAs) is 40 kilometers.

A potential issue is that family planning services might have been available earlier in a neighboring administrative area, but unfortunately we do not have information about this.

5. We use the variables described above as determinants of the availability of family planning program in 1985 for a total of 104 areas (*kebeles* or PAs). The results are broadly similar if we use ranking or distance to the mean for the 13 variables. The two most significant variables are urbanization and what percentage of the population is illiterate. For both variables the higher above the national mean a zone is, the more likely it is that the PA/town had a family planning program by 1985. None of the *woreda* variables seem to exert much influence within the zone, which is probably due to the low number of observations.

6. There is unfortunately no information on the migration of women which makes it difficult to determine for how long they have been exposed to information about family planning. Hence, we essentially assume that a woman has spent her entire life in the area where she was found during the survey. This is a plausible assumption given very limited migration in Ethiopia.



## Appendix E: Estimated Results on the Determinants of Birth in the Past 3 Years

Table E 1: Determinants of probability of giving birth in the past 3 years

	(1) 15-49	(2) 15-19	(3) 20-24	(4) 25-29	(5) 30-34	(6) 35-39	(7) 40-49
Log [HH consumption]	-0.029 [1.21]	0.045*** [6.49]	0.356*** [6.70]	-0.058 [1.15]	-0.348*** [5.15]	-0.621*** [6.72]	-0.570*** [10.20]
Woman: some primary schooling	-0.057*** [3.20]	-0.011*** [2.99]	-0.097** [2.49]	0.007 [0.20]	-0.012 [0.24]		
Woman: more than primary schooling	-0.089*** [3.11]	-0.015*** [3.25]	-0.209*** [3.54]	-0.093* [1.80]	0.025 [0.35]		
Woman: any schooling						0.025 [0.38]	0.027 [0.41]
Religion: Orthodox	0.057*** [3.01]	-0.003 [0.44]	0.097** [2.26]	0.049 [1.22]	-0.009 [0.17]	0.096* [1.66]	0.073** [2.03]
Religion: Muslim	0.038* [1.88]	-0.006 [1.11]	0.032 [0.74]	0.025 [0.58]	0.024 [0.44]	0.148** [2.32]	0.044 [1.12]
Rural	0.080** [2.10]	0.011 [1.24]	0.033 [0.36]	0.092 [1.13]	0.103 [0.95]	0.348*** [3.28]	0.097 [1.46]
<i>Community characteristics</i>							
%women with good source of water	0.059* [1.71]	0.012 [1.23]	0.002 [0.02]	0.082 [1.12]	-0.021 [0.25]	0.287** [2.47]	0.052 [0.81]
Log [mean HH consumption]	-0.181*** [3.05]	-0.056*** [2.88]	-0.385*** [3.03]	-0.119 [0.99]	0.179 [1.17]	0.078 [0.46]	0.034 [0.27]
Exposure of men to FP	0.005 [0.16]	0 [0.01]	0.01 [0.13]	-0.06 [0.82]	0.071 [0.80]	-0.007 [0.07]	-0.042 [0.67]
Women's knowledge of FP	-0.039 [1.15]	-0.002 [0.17]	-0.069 [0.89]	-0.003 [0.04]	-0.145 [1.64]	0.014 [0.15]	0.004 [0.07]
Mean years of female schooling	-0.049*** [5.15]	-0.004 [1.64]	-0.048** [2.22]	-0.047** [2.48]	-0.051** [2.01]	-0.008 [0.29]	-0.053*** [2.64]
Mean years of male schooling	0.018** [1.97]	0.004 [1.31]	0.025 [1.17]	0.013 [0.71]	0.021 [0.92]	0.002 [0.07]	0.008 [0.38]
Child MR	-0.158 [1.31]	0.001 [0.04]	0.464 [1.64]	-0.438* [1.75]	-0.094 [0.29]	0.142 [0.42]	-0.405* [1.79]
Women decide on money expenditures	-0.058	0.007	0.065	-0.132*	-0.018	-0.109	-0.044

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	15-49	15-19	20-24	25-29	30-34	35-39	40-49
Women report that beating is justified	[1.54] 0.042	[0.62] -0.009	[0.73] -0.074	[1.68] 0.111	[0.18] 0.257*	[1.04] 0.145	[0.63] 0.02
Afar	[0.70] -0.098***	[0.52] 0.003	[0.55] -0.029	[0.93] -0.111	[1.75] -0.051	[0.82] -0.330***	[0.18] -0.095*
Amhara	[2.84] -0.003	[0.24] 0.013*	[0.36] 0.063	[1.44] 0.014	[0.54] -0.037	[3.37] -0.189***	[1.72] -0.02
Oromiya	[0.14] 0.04	[1.73] -0.007	[1.13] 0.099	[0.28] 0.083	[0.59] 0.088	[2.72] -0.017	[0.46] 0.021
Somali	[1.25] -0.066	[0.77] 0	[1.43] 0.038	[1.31] -0.009	[1.15] 0.011	[0.18] -0.255**	[0.36] -0.065
Benshangul/Gumuz	[1.61] -0.086**	[0.02] -0.005	[0.41] 0.083	[0.11] -0.07	[0.11] -0.125	[2.29] -0.242**	[0.88] -0.142***
SNNPR	[2.48] -0.064*	[0.71] -0.019***	[0.99] -0.069	[0.90] -0.046	[1.32] -0.025	[2.54] -0.102	[2.89] -0.035
Gambella	[1.86] -0.026	[3.16] -0.001	[0.88] 0.057	[0.64] -0.085	[0.28] -0.075	[1.01] -0.04	[0.52] -0.041
Harari	[0.60] 0.019	[0.11] -0.007	[0.58] 0.055	[0.97] 0.038	[0.66] 0.133	[0.34] -0.094	[0.50] 0.053
Addis Ababa	[0.44] -0.032	[0.73] 0.002	[0.58] -0.058	[0.47] -0.025	[1.34] 0.138	[0.70] -0.179	[0.55] -0.078
Dire Dawa	[0.68] -0.023	[0.13] 0.001	[0.56] -0.152*	[0.28] 0.023	[1.34] 0.107	[1.15] -0.084	[0.83] -0.043
	[0.57]	[0.04]	[1.80]	[0.30]	[1.16]	[0.64]	[0.59]
Observations	15,362	3,581	2,844	2,716	1,902	1,761	2,558
Mean of dependent variable	0.418	0.095	0.508	0.682	0.661	0.550	0.262

Source: Authors' calculations from DHS 2000. Robust t statistics in brackets. \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%. Regressions include controls for age and region. Probit marginal effects.

## REFERENCES

- Adams, R. (2004). Economic Growth, Inequality and Poverty: Estimating the Growth Elasticity of Poverty. *World Development*, 32(12): 1989-2004.
- Ahmed, J. and Mengistu, Genet. (2002). *Evaluation of Program Options to Meet Unmet Need for Family Planning in Ethiopia*. Calverton, Maryland: ORC Macro.
- Ainsworth, M., Beegle, K. and Nyamete, A. (1996). The Impact of Women's Human Capital on Fertility and Contraceptive Use: A Study of 14 sub-Saharan African Countries. *World Bank Economic Review*, 10(1): 85-122.
- Alan Guttmacher Institute. (2002). *Issues in Brief 2002 Series No.2: Family Planning can Reduce High Infant Mortality Levels*. New York, NY: The Alan Guttmacher Institute.
- Angeles, G., Guilkey, D.K., and Mroz, T.A. (1998). Purposive Program Placement and the Estimation of Family Planning Program Effects in Tanzania. *Journal of the American Statistical Association*, 93(443): 884-99.
- Angeles, G., Guilkey, D.K., and Mroz, T.A. (2005a). The Determinants of Fertility in Rural Peru: Program Effects in the Early Years of the National Family Planning Program. *Journal of Population Economics*, 18: 367-389.
- Angeles, G., Guilkey, D.K., and Mroz, T.A. (2005b). The Effects of Education and Family Planning Programs on Fertility in Indonesia. *Economic Development and Cultural Change*, 54(1): 165-201.
- Ashford, L. (2003). *Unmet Need for Family Planning: Recent Trends and Their Implications for Programs*. Measure Communication Policy Brief. Washington, DC: Population Reference Bureau.
- Barberis, M. and Harvey, P.D. (1997). Costs of Family Planning Programmes in Fourteen Developing Countries by Method of Service Delivery. *Journal of Biosocial Sciences*, 29(2): 219-233.
- Bhargava, A. (2005). *Desired Family Size, Family Planning and Fertility in Ethiopia*. Mimeographed.
- Bhargava, A., Chowdhury, S. and Singh, K.K. (2005). Healthcare Infrastructure, Contraceptive Use, and Infant Mortality in Uttar Pradesh, India. *Economics and Human Biology*, 3(3): 388-404.
- Birdsall, N., Kelley, A.C., and Sinding, S.W. (Eds.). (2001). *Population Matters: Demographic Change, Economic Growth, and Poverty in the Developing World*. Oxford: Oxford University Press.
- Bloom, D. and Williamson, J.C. (1998). Demographic Transitions and Economic Miracles in Emerging Asia. *World Bank Economic Review*. 12(3): 419-455.
- Bloom, D.E., Canning, D., Fink, G., and Finlay, J. (2007). *Realizing the Demographic Dividend: Is Africa any different?* Program of the Global Demography of Aging Working Paper No. 23. Cambridge, MA: Harvard University, Harvard Initiative for Global Health (mimeo.).

- Bongaarts, J. (1978). A Framework for Analyzing the Proximate Determinants of Fertility. *Population and Development Review*, 4(1): 105-132.
- Bongaarts, J., O. Frank, and R. Lesthaeghe. (1994). The Proximate Determinants of Fertility in sub-Saharan Africa. *Population and Development Review*, 10(3): 511-537.
- Boserup, E. (1965). *The Conditions of Agricultural Growth: The Economics of Agrarian Change under Population Pressure*. London: George Allen & Unwin.
- Central Statistical Agency and ORC Macro. (2006). *Ethiopia Demographic and Health Survey 2005*. Addis Ababa, Ethiopia and Calverton, Maryland, USA: Central Statistical Agency and ORC Macro.
- Central Statistical Authority. (n.d.). *Welfare Monitoring Survey (WMS) data*. Addis Ababa, Ethiopia: Federal Democratic Republic of Ethiopia (various years, including 1995 and 2000).
- Central Statistical Authority. (1984). *The 1984 Population and Housing Census of Ethiopia*. Addis Ababa, Ethiopia: Federal Democratic Republic of Ethiopia.
- Central Statistical Authority. (1993). *The 1990 National Family and Fertility Survey Report*. Addis Ababa, Ethiopia: Federal Democratic Republic of Ethiopia.
- Central Statistical Authority. (1994). *The 1994 Population and Housing Census of Ethiopia*. Addis Ababa, Ethiopia: Federal Democratic Republic of Ethiopia.
- Central Statistical Authority. (2000). *The 1999 National Labour Force Survey*. Addis Ababa, Ethiopia: Federal Democratic Republic of Ethiopia.
- Central Statistical Authority. (2001). *Ethiopia Demographic and Health Survey 2000*. Addis Ababa, Ethiopia: Federal Democratic Republic of Ethiopia.
- Central Statistical Authority. (2002). *The 1999/2000 Household Income, Consumption, and Expenditure Survey*. Addis Ababa, Ethiopia: Federal Democratic Republic of Ethiopia.
- Central Statistical Authority. (2005). *Ethiopia Demographic and Health Survey 2005: Preliminary Report*. Addis Ababa, Ethiopia: Federal Democratic Republic of Ethiopia.
- Chasteland, J.-C. and J.-C. Chesnais (Eds.). (2002). *La Population du Monde. Géants Démographiques et Défis Internationaux* (2<sup>nd</sup> ed.). Les Cahiers de l'INED No. 149. Paris, France: Institut national d'études démographiques.
- Chesnais, J.-C. (1992). *The Demographic Transition. Stages, Patterns, and Economic Implications*. Oxford: Oxford University Press.
- Cincotta, R.P., Engelman, R. and Anastasion, D. (2003). *The Security Demographic: Population and Civil Conflict after the Cold War*. Washington, DC: Population Action International.
- Cleland, J. and Wilson, C. (1987). Demand Theories of the Fertility Transition: An Iconoclastic View. *Population Studies*, 41(1):5-30.
- CORHA. (2004). *Contraceptive Need Assessment*. Addis Ababa, Ethiopia: Consortium of Reproductive Health Associations (CORHA).

- Degraff, D., Bilborrow, R. and Guilkey, D. (1997). Community Level Determinants of Contraceptive Use in the Philippines: A Structural Analysis. *Demography*, 34(3): 385-398.
- Deye, G. (2005). *A Whole Market Approach to Achieving the Public Health Mandate*. Slideshow presented at the East Africa Reproductive Health Contraceptive Security Workshop: Ensuring Access to Family Planning. Dar-Es-Salaam, Tanzania (November 16, 2005).
- Eastwood, R. and Lipton, M. (2001). Demographic Transition and Poverty: Effects via Economic Growth, Distribution and Conversion. In Birdsall, N., Kelley, A. C., and Sinding, S. W. (Eds.), *Population Matters: Demographic Change, Economic Growth, and Poverty in the Developing World* (Chapter 9). Oxford: Oxford University Press.
- EGLDAM. (2005). *Early Marriage in Ethiopia: Law and Social Reality*. Addis Ababa, Association for the Elimination of Harmful Traditional Practices in Ethiopia (EGLDAM), UNIFEM, and UNFPA.
- Essential Services for Health in Ethiopia. (2005). *Twelve Baseline Health Surveys: Household Health, Health Facility, Health System Performance and Health Care Financing Surveys in Amhara, Oromiya, and SNNPR Regions*. Addis Ababa.
- Eswaran, M. (2002). The Empowerment of Women, Fertility, and Child Mortality: Towards a Theoretical Analysis. *Journal of Population Economics*, 15(3): 433-454.
- Ethiopian Economic Association/Ethiopian Economic Policy Research Institute. (2003). *Family Planning Services: An Important Front in the Battle against Poverty in Ethiopia*. Addis Ababa, Ethiopia: Ethiopian Economic Association/Ethiopian Economic Policy Research Institute and The David and Lucile Packard Foundation.
- Fitaw, Y., Berhane, Y. and Worku, A. (2003). Differentials of Fertility in Rural Butajira. *Ethiopian Journal of Health Development*, 17(1): 17-25.
- Futures Group International. (2002). *The 2002 National Family Planning Program Effort Index for Ethiopia*. Washington, DC: Futures Group International.
- Galor, O. and Weil, D.N. (2000). Population, Technology, and Growth: From Malthusian Stagnation to the Demographic Transition and Beyond. *The American Economic Review*, 90(4): 806-828.
- Gertler, P. and Molyneaux, J. (1994). How Economic Development and Family Planning Programs Combined to Reduce Indonesian Fertility. *Demography*, 31(1): 33-63.
- Getahun, H. and Eshete, H. (2003). *Macro-level Operational Barriers to Family Planning Services in Ethiopia: Taxation and Importation of Contraceptives and the Role of NGOs*. Ethiopia: POLICY Project.
- Govindasamy, P., Kidanu, A. and Banteyerga, H. (2002). *Youth Reproductive Health in Ethiopia*. Calverton, Maryland: ORC Macro.
- Grepperud, S. (1996). Population Pressure and Land Degradation: The Case of Ethiopia. *Journal of Environmental Economics and Management*, 30: 18-33.

Gubhaju, B. (1997). L'Éthiopie au temps des troubles. In J.-C. Chasteland and J.-C. Chesnais (Edits). *La Population du Monde*, Cahier No. 139, Institut national d'Études Démographiques: Presses Universitaires de France. Pp. 149-161.

Gubhaju, B. (2002). Éthiopie: guerres et population. In J.-C. Chasteland and J.-C. Chesnais (Edits). *La Population du Monde*, 2<sup>nd</sup> edit., Cahier No. 149, Institut national d'Études Démographiques: Presses Universitaires de France. Pp. 213-226.

Guengant, J.-P. and May, J.F. (2006). Impact des déterminants immédiats de l'évolution à venir de la fécondité en Afrique sub-saharienne. *Perspectives de baisse du taux de fécondité dans les pays à taux de fécondité élevé. Bulletin démographique des Nations Unies*. Special Issue Nos. 46/47, 2002. Pp. 93-131.

Hayami, Y. and Ruttan, V.W. (1985). *Agricultural Development: An International Perspective*. Baltimore, MD : Johns Hopkins University Press.

Hogan, D., Berhanu, B. and Hailemariam, A. (1999). Household Organization, Women's Autonomy, and Contraceptive Behavior in Southern Ethiopia. *Studies in Family Planning*, 30(4): 302-314.

IPAS. (2005). *New Law in Ethiopia Represents a Step Forward for Women's Reproductive Rights*. IPAS Press Room June 7, 2005. Retrieved online on May 24 2006, at [http://www.ipas.org/english/press\\_room/2005/releases/06072005.asp](http://www.ipas.org/english/press_room/2005/releases/06072005.asp).

Janowitz, B. and Bratt, J.H. (1994). *Methods for Costing Family Planning Services*. New York: United Nations Population Fund & Family Health International.

Joshi, S. and Schultz, T.P. (2005). *Evaluating the Long-term Consequences of a Family Planning Program Interventions for Women and their Children in Matlab, Bangladesh*. Mimeographed. Yale University, New Haven, CT.

JSI/DELIVER. (2003). *DELIVER Technical Assistance Record*. Arlington, Virginia: unpublished.

JSI/DELIVER. (2004). *DELIVER Technical Assistance Record*. Arlington, Virginia: unpublished.

Kinfu, Y. (2000). Below-replacement Fertility in Tropical Africa? Some Evidence from Addis Ababa. *Journal of Population Research* 17(1): 63-82.

Klasen, S. (2003). Malnourished and Surviving in South Asia, Better Nourished and Dying Young in Africa: What Can Explain the Puzzle? In FAO (Eds.) *Measurement and Assessment of Food Deprivation and Undernutrition* (Pp. 283-286). Rome: FAO.

Klasen, S. (2005). Population Growth, Economic Growth, and Poverty Reduction in Uganda: Theory and Evidence. *Discussion Paper Series* No. 125. Department of Economics. University of Goettingen.

Korra, A. (2002). *Attitudes toward Family Planning and Reasons for Nonuse among Women with Unmet Need for Family Planning in Ethiopia*. Calverton, Maryland: ORC Macro.

Krugman. P. (1994). The Myth of Asia's Miracle. *Foreign Affairs*. 73: 62-78.

Lee, R., Mason, A. and Miller, T. (2001). Saving, Wealth, and the Demographic Transition in East Asia. In Mason, A. (Ed.), *Population Change and Economic Development in East Asia: Challenges Met, Opportunities Seized* (Pp. 155-184). Stanford: Stanford University Press.

- Levine, R. and the What Works Working Group. (2004). *Millions Saved: Proven Successes in Global Health*. Washington, DC: Center for Global Development.
- Lindelow M. and Serneels, P. (2006). *The Performance of Health Workers in Ethiopia*. Results from Qualitative Research, Social Science and Medicine, forthcoming, (earlier versions also as CSAE Working Paper 2005-06; World Bank Policy Research Working Paper 3558).
- Lindstrom, D.P. and Woubalem, Z. (2003). The Demographic Components of Fertility Decline in Addis Ababa: A Decomposition Analysis. *Genus* *LLX*(3-4): 147-158.
- Logistics Masterplan Team for Ethiopia. (2006). *Design for a New Health Commodities Supply System in Ethiopia*. Addis Ababa.
- Lutz, W., Scherbov, S., Makinwa-Adebusoye, P.K., and Reniers, G. (2004). Population-Environment-Development-Agriculture Interactions in Africa: A Case Study on Ethiopia, in W. Lutz, W.C. Sanderson, and S. Scherbov (Edits). *The End of World Population Growth in the 21<sup>st</sup> Century. New Challenges for Human Capital Formation and Sustainable Development*. London and Sterling, VA: IIASA and Earthscan, Pp. 187-225.
- Malthus, T.R. (1798). *An Essay on the Principle of Population as it Affects the Future Improvement of Society, with Remarks on the Speculations of Mr. Godwin, M. Condorcet, and Other Writers*. London: J. Johnson.
- May, J.F. (2005). Population Policy. In D. Poston and M. Micklin (Eds.), *Handbook of Population*. New York: Kluwer Academic/Plenum Publishers. Pp. 827-852.
- McFalls, J. (2003). *Population: A Lively Introduction* (4<sup>th</sup> ed.). Washington, DC: Population Reference Bureau.
- Mekonnen, M. (2004). Population Dynamics and the Strategy for Sustainable Development and Poverty Reduction in Ethiopia. *Population and Development: A Decade's Overview*. Population Media Center, Addis Ababa, Ethiopia.
- Mekonnen, Y. (2005). *The Status and Trend of Family Planning in Ethiopia*. Mimeographed. Addis Ababa, Ethiopia.
- Mekonnen, Y. and Yimer, G. (2005). *Bio-demographic and Socio-economic Correlates of Infant Mortality in Ethiopia: Evidence from the Demographic Health Survey*. Mimeographed.
- Mengistu, Genet. (2007). *Ethiopia: Reducing Unmet Need for Family Planning*. Towards Universal Access to Reproductive Health: Policies, Systems and Capacity Building Innovations. 27-30 November, 2006. Kuala Lumpur. Report of the 16<sup>th</sup> ICOMP International Seminar. (Dhaka, Bangladesh): ICOMP.
- Menon, N. (2001). *Evaluating Program Effects with Endogenous Program Placement*. Ph.D. Thesis, Brown University.
- Miller, G. (2005). *Contraception as Development? New Evidence from Family Planning in Colombia*. NBER Working Paper W11704. Cambridge, MA: National Bureau of Economic Research (NBER).

Ministry of Finance and Economic Development. (2002). *Sustainable Development and Poverty Reduction Program (SDPRP)*. Addis Ababa, Ethiopia: Federal Democratic Republic of Ethiopia.

Ministry of Finance and Economic Development. (2006a). *Demography of Ethiopia: A Brief Note on the Current and the Future*. Addis Ababa, Ethiopia: Federal Democratic Republic of Ethiopia.

Ministry of Finance and Economic Development. (2006b). *Ethiopia: Building on Progress: A Plan for Accelerated and Sustained Development to End Poverty (PASDEP) (2005/06-2009/10)*. Addis Ababa, Ethiopia: Federal Democratic Republic of Ethiopia, 2 vol.

Ministry of Health. (1996). *Guidelines for Family Planning Services in Ethiopia*. Addis Ababa, Ethiopia: Federal Democratic Republic of Ethiopia.

Ministry of Health. (1998). *Program Action Plan for the Health Sector Development Program*. Addis Ababa, Ethiopia: Federal Democratic Republic of Ethiopia.

Ministry of Health. (2003). *Family Planning Extension Package*. Addis Ababa, Ethiopia: Federal Democratic Republic of Ethiopia.

Ministry of Health. (2004a). *National Pharmaceutical Logistics System Study – Inception Report*. Addis Ababa, Ethiopia: Federal Democratic Republic of Ethiopia.

Ministry of Health. (2004b). *Report of the 1<sup>st</sup> Mission of Technical Assistance to PASS for the Pharmaceutical Logistics Systems Study in Ethiopia*. Addis Ababa, Ethiopia: Federal Democratic Republic of Ethiopia.

Ministry of Health. (2006a). *National Reproductive Health Strategy. 2006-2015*. Addis Ababa, Ethiopia: Federal Democratic Republic of Ethiopia.

Ministry of Health. (2006b). *Technical and Procedural Guidelines for Safe Abortion Services in Ethiopia*. Addis Ababa, Ethiopia: Federal Democratic Republic of Ethiopia.

Ministry of Health (2007). *National Adolescent and Youth Reproductive Health Strategy. 2007-2015*. Addis Ababa, Ethiopia: Federal Democratic Republic of Ethiopia.

Ministry of Health – Disease Prevention and Control Department. (2004). *Aids in Ethiopia, Fifth report*. Addis Ababa, Ethiopia: Federal Democratic Republic of Ethiopia.

Ministry of Health – Family Planning Department. (2004). *National Contraceptive Forecast for the Years 2004-2010 and Resource Analysis for 2004 and 2006*. Addis Ababa, Ethiopia: Federal Democratic Republic of Ethiopia.

Ministry of Health – Family Planning Department. (2005). *National Contraceptive Forecast 2005-2010 and Resource Analysis for 2005-2006*. Addis Ababa, Ethiopia: Federal Democratic Republic of Ethiopia.

Ministry of Health – Planning and Programming Department. (1992). *Health and Health Related Indicators*. Addis Ababa, Ethiopia: Federal Democratic Republic of Ethiopia.

Ministry of Health – Planning and Programming Department. (1997). *Health and Health Related Indicators*. Addis Ababa, Ethiopia: Federal Democratic Republic of Ethiopia.



- National Office of Population. (2000). *Ethiopian Population Profile, 1999*. Addis Ababa, Ethiopia: Federal Democratic Republic of Ethiopia, Ministry of Finance and Economic Development.
- National Office of Population. (2003). *Proceedings of the National Population Conference to Commemorate the Tenth Anniversary of the National Population Policy of Ethiopia (7-8 July 2003)*. Addis Ababa, Ethiopia: Federal Democratic Republic of Ethiopia, Ministry of Finance and Economic Development.
- NCAPD. (2004). *Proposal for Contraceptive Requirements in the Private Sector in Kenya*. Nairobi, Kenya: Republic of Kenya, National Coordinating Agency for Population and Development.
- Partnership in Improving Reproductive Health. (2001). *Findings from the Amhara and Oromiya Demographic Surveys: Childbearing and Family Planning – Experience, Knowledge, and Intentions. Background Report*. Providence, RI: Brown University; Addis Ababa, Ethiopia: Addis Ababa University; Jimma, Ethiopia: Jimma University.
- Pathfinder International Ethiopia. (2003). *Assessment of the Causes for Low Utilization of IUCDs as Family Planning Method in Ethiopia*. Addis Ababa, Ethiopia.
- Pathfinder International Ethiopia. (2004). *Community-based Reproductive Health Programs in Ethiopia: Roles, Lessons Learned, and Gaps*. Addis Ababa, Ethiopia.
- Pathfinder International Ethiopia. (2005a). *Findings of a Survey of KAP of FP in Amhara, Oromiya, SNNPR, and Tigray Regions of Ethiopia, November 2004 – Final Report*. Addis Ababa, Ethiopia.
- Pathfinder International Ethiopia. (2005b). *Knowledge, Attitudes, and Practices in Family Planning: Results of September 2004 Survey in Amhara, Oromiya, SNNPR, and Tigray Regions of Ethiopia*. Addis Ababa, Ethiopia.
- Pathfinder International Ethiopia. (2006a). *Ethiopia: Faith-based Organizations – The Key to Community Trust*. Addis Ababa, Ethiopia.
- Pathfinder International Ethiopia. (2006b). *Ethiopia: Preventing Early Marriage at the Community Level in Amhara Region*. Addis Ababa, Ethiopia.
- Pathfinder International Ethiopia. (2006c). *Guidelines for Identifying a Best Practice*. Addis Ababa, Ethiopia.
- Pathfinder International Ethiopia. (2006d). *Yebeteseb Mela* (various articles).
- Phillips, J.F., Simmons, R., Koenig, M.A. and Chakraborty, J. (1988). Determinants of Reproductive Change in a Traditional Society: Evidence from Matlab, Bangladesh. *Studies in Family Planning*, 19(6): 313–334.
- Pitt, M. M., Rosenzweig, M.R., and Gibbons, D.M. (1993). The Determinants and Consequences of the Placement of Government Programs in Indonesia. *World Bank Economic Review*, 7(3): 319–48.
- POLICY Project. (1997). *EXCEL Worksheet: Proximate Determinants of Fertility*. Washington, DC: Futures Group International.

- POLICY Project. (1998). *Reproductive Health Costs Literature Review*. Washington, DC: Futures Group International.
- POLICY Project. (2004a). *Country Analysis of Family Planning and HIV/AIDS: Ethiopia*. Washington, DC: Futures Group International.
- POLICY Project. (2004b). *Revisiting the National Population Policy of Ethiopia of April 1993*. Addis Ababa, Ethiopia: unpublished.
- Population Reference Bureau. (2004). *World Population Data Sheet 2004*. Washington, DC: Population Reference Bureau.
- Population Reference Bureau. (2005). *World Population Data Sheet 2005*. Washington, DC: Population Reference Bureau.
- Pritchett, L.H. (1994). Desired Fertility and the Impact of Population Policies. *Population and Development Review*, 20(1): 1–56.
- Ravallion. M. (2001). Growth, Inequality and Poverty: Looking Beyond Averages. *World Development*, 29(11):1803-15.
- Ross, J. and Stover, J. (2001). The Family Planning Program Effort Index: 1999 Cycle. *International Family Planning Perspectives*, 27(3): 119-129.
- Rosenzweig, M.R. and Wolpin, K.I. (1986). Evaluating the Effects of Optimally Distributed Public Programs: Child Health and Family Planning Interventions. *American Economic Review*, 76: 470–482.
- Ruel, M.T., Quisumbing, A.R., Hallman, K., de la Brière, B., and de Salazar, N.C. (2006). *The Guatemala Community Day Care Program: an example of effective urban programming*. (Research Report 144). Washington, DC: International Food Policy Research Institute (IFPRI).
- Serneels, P., Garcia-Montalvo, J., Lindelow, M., and Barr, A. (2005). *For Public Service or for Money: Understanding Geographical Imbalances in the Health Workforce*. World Bank Policy Research Working Paper 3686, GPRG working paper 018.
- Sibanda, A., Woubalem, Z., Hogan, D.P., and Lindstrom, D.P. (2003). The Proximate Determinants of the Decline to Below-replacement Fertility in Addis Ababa, Ethiopia. *Studies in Family Planning*, 34(1): 1-7.
- Stover, J. (1998). Revising the Proximate Determinants of Fertility Framework: What Have We Learned in the Past 20 Years? *Studies in Family Planning* 29(3): 255-267.
- Transitional Government of Ethiopia. (1993). *National Population Policy of Ethiopia*. Addis Ababa, Ethiopia: Federal Democratic Republic of Ethiopia, Office of the Prime Minister. Available at <http://www.un.org/popin/regional/africa/ethiopia/policy/>.
- Turner, B. (Ed.). (2006). *The Statesman's Yearbook: The Politics, Cultures and Economies of the World* (142<sup>nd</sup> ed.). New York: Palgrave Macmillan.
- UNFPA. (2006). *Achieving the ICPD Goals: Reproductive Health Commodity Requirements 2000-2015*. New York, NY: United Nations Population Fund.

United Nations. (n.d.). *Focus on Ethiopia: Regional Overview*. Addis Ababa: United Nations (published in 2005).

United Nations. (2004). *Populations in the Horn of Africa Region*. Addis Ababa: United Nations.

United Nations. (2005). *World Population Prospects: The 2004 Revision*. New York, NY: United Nations Population Division.

United Nations. (2006). *World Population Prospects: The 2006 Revision*. New York, NY: United Nations Population Division (available at <http://www.un.org/esa/population/publications/wpp2006/wpp2006.htm>).

Williamson. J. (2001). Demographic Change, Economic Growth, and Inequality. in Birdsall, N., Kelley, A. C., and Sinding, S. W. (Eds.). (2001). *Population Matters: Demographic Change, Economic Growth, and Poverty in the Developing World*. Oxford: Oxford University Press.

Worku, S. (2006). *Demography of Ethiopia: A Brief Note on the Current and the Future*. Mimeographed. Addis Ababa: Ministry of Finance and Economic Development.

World Bank. (1984). *World Development Report*. New York: Oxford University Press.

World Bank. (2004). *Ethiopia: A Country Status Report on Health and Poverty*. Washington, DC: World Bank.

World Bank. (2005a). *Education in Ethiopia: Strengthening the Foundation for Sustainable Progress*. Washington DC: World Bank.

World Bank. (2005b). *Ethiopia. Strategic Country Gender Assessment*. Mimeographed. Washington, DC: World Bank.

World Bank. (2005c). *Ethiopia: Well-being and Poverty in Ethiopia. The Role of Agriculture and Agency*. Washington, DC: World Bank.

World Bank. (2005d). *2005 World Development Indicators*. Washington, DC: World Bank.

World Bank. (2006a). *Ethiopia Rural Development Review, Agricultural Growth for Poverty Reduction*. Mimeographed. Washington DC: World Bank.

World Bank. (2006b). *Poverty and Land Degradation in Ethiopia: How to Reverse the Spiral?* Mimeographed. Washington, DC: World Bank.

World Bank. (2006c). *Project Appraisal Document on a Proposed Grant in the Amount of SDR 118.5 Million (US\$ 175 Million Equivalent) to the Federal Democratic Republic of Ethiopia for a Productive Safety Net APL II Project in Support of the Second Phase of the Productive Safety Net Program. December 11, 2006*. Washington, DC: World Bank.

World Bank. (2006d). *2006 World Development Indicators*. Washington, DC: World Bank.

World Bank. (2007a). *Ethiopia: Accelerating Equitable Growth – Country Economic Memorandum, Poverty Reduction and Economic Management Unit, Africa Region, Report No. 38662-ET*, Washington DC: World Bank.

World Bank. (2007b). *Ethiopia Urban Labor Markets in Ethiopia: Challenges and Prospects*, Poverty Reduction and Economic Management Unit, Africa Region, Report No. 38665-ET, Washington DC: World Bank, 2 vol.

World Bank. (2007c). *Population Issues in the 21<sup>st</sup> Century. The Role of the World Bank*. Washington, DC: World Bank.

World Bank. (2007d). *2007 World Development Indicators*. Washington, DC: World Bank.

Yamano, T., Alderman, H. and Christiaensen, L. (2005). Child Growth, Shocks, and Food Aid in Rural Ethiopia. *American Journal of Agricultural Economics*, 87(2): 273-288.

Yunker, J.A. (2003). Estimating Optimal Expenditures on Family Planning in Developing Economies. *Population Research and Policy Review*, 22(2): 103-126.