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The Demographic Transition, Youth Potential and Development Nexus in Ethiopia: Dividend or Burden?

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Abstract

The thesis addresses the demographic transition potential in Ethiopia and the possibility of capturing the demographic dividend observed in some East Asian Countries, as well as, suggests mechanisms to facilitate this possible opportunity. It is based on the "Spectrum" Projection Model covering the period from 1994 to 2050. The age structure of the Ethiopian population has remained child and youth dominated for along time now, but with recent incipient fertility decline expected to be expediting, Ethiopia's demographic profile will see considerable shift in the next four decades.

Education and employment indicators witness that despite striking improvements in primary education and modest decline in unemployment rate past years, there is still huge unemployment rate and low secondary school enrollment, as well as, wide gender disparity in both secondary education and formal employment. Projections under three different fertility scenarios reveal that fertility plays multiple roles in boosting Ethiopia to reap the demographic dividend through; reducing population size, changing the age structure and raising the status of women. Thus it will determine Ethiopia's future development course including its prospects of joining Middle Income Countries. This requires the government to allocate more funds for family planning service provision and diffusion of small family norm in its development strategy as well as establishing quality institution including evaluating the old population policy of Ethiopia.

Nonetheless, the demographic dividend is not automatic, nor does the window of opportunity lasts forever. Hence it can be reaped if policies and programs in countries at the incipient stages of the demographic transition are focused on the needs, aspirations and expectations for a growing bulge of young people. These preconditions, among others, include training and job creation for youth, quality and efficient educational system, agricultural modernization and intensification, labor intensive production technology, healthier lifestyles, and institutional developments. Under business as usual scenario, however, the future is bleak and the youth would turn out to be given up burdens rather than grown up dividend.

CHAPTER ONE

1.1. BACKGROUND

There have been dramatic changes in size, distribution and age structure of the world population since the second half of the 19th century. In 1900, global population stood at about 1.6 billion. By 2000, those digits had reversed and global population reached 6.1 billion signaling that the world population increased nearly four fold in 100 years (Kent and Haub, 2005). Demographic data also prove that the recent period of rapid expansion of human numbers began in late nineteenth century and increased to an unprecedented level in the second half of the twentieth century. For example, over the past three decades (1970 to 2000) world population has increased by a record 2 billion, and the same increase is projected over the next thirty years, making the period from 1970 to 2030 the peak of the transition (Bongaarts, 2001) in demographic history.

The acceleration of population growth mainly in the second half of the twentieth century was caused primarily by a sustained reduction in mortality, mostly in less developed countries. Many factors in different parts of the world played their part in bringing mortality down, and these include; improved living standards, better nutrition, greater investment in sanitation and clean water supplies, expanded access to health services, and wider applications of low-cost public health measures such as immunization (Bloom and Williamson, 1997). These yielded very rapid mortality reductions while fertility lagged behind for sometime. Later, fertility followed the path of mortality and the falling birth rate makes for a smaller population at young, dependent ages and for relatively more people in the adult age groups who comprise the productive labor force.

A glimpse at population and development linkages witness that there remained a continued hot debate among scholars as to whether population is an asset or liability for a country. These scholars stretch between two extremes of population alarmists and cornucopias, and are generally categorized as optimists, pessimists and neutralists/revisionists. Proponents of population pessimism, optimism, and neutralism can all fall back on theoretical models and more or less robust data to support their positions. However, focusing on population size, density and growth, the debate among

these groups has largely ignored a critical demographic variable, i.e., age structure of the population (Bloom and Williamson, 1997).

Among varied theories of population, the change in age structure is well documented in the theory of demographic transition. The theory, among others, states that as a nation develops its mortality rate declines first, while its birth rate, through the application of technology of birth and death control, is attenuated later. The lag in time between the decline in death and birth rates accounted for the rapid population growth observed in developing nations and also the subsequent change in age structure. Nevertheless, the timing of the onset and duration of the demographic transitions differ widely between and within regions of the world. Empirical literatures confirm that almost all developed countries have completed their demographic transitions while most developing countries are in the later stages of the transition (Bloom and Williamson, 1997) On the other hand, most Sub-Sahara African countries are still in the early or incipient stages of the transition as they have experienced only modest declines in death rates and virtually no or slight change in birth rates (Bloom et al., 2001).

The less developed countries of Africa, Asia, and Latin America and the Caribbean are projected to increase by just fewer than 50 percent in the 41 years between 2009 and 2050, and the poorest of these are projected to double in population size over that period. Africa is the region with both the highest birth rates and largest percentage of population growth projected for 2050. The continent's current population of nearly 1 billion is projected to double in size by 2050. Even after declines, Africa's birth rates remained relatively high and its population is very young, with 43 percent of Sub-Saharan Africa's population below the age of 15 (PRB, 2009).

Ethiopia's population profile is not different either. The country's population has increased from an estimated size of around 18 Million in 1950 (UN, 2009) to around 74 Million in 2007(CSA, 2008) and is expected to reach as high as 174 Million by 2050 according to the Medium Variant Projection of the United Nations (2009). The annual average population growth rate was 2.6% in the period 1994 to 2007 with a population

doubling time of around 27 years (CSA, 2008). This shows that the country is an African demographic giant next to Nigeria.

On the other hand, Ethiopia is a small economy that could not succeed in fully satisfying the development needs of its citizens. For example, its GNI per capital income of 870 USD PPP is lowest even by Sub Sahara African standards of 1950 USD PPP (PRB, 2009). More startling is its Human Development Index1[1] of 0.414 in 2008 that put Ethiopia in 171st place out of 182 countries included in the analysis (UNDP, 2009).

These show that there are imbalances between population pressure and performance of the Ethiopian economy. The country's population is growing rapidly and the age structure, as a result of high fertility and rapid population growth rate, remained youthful. Accordingly, the population below age 15 is as high as 45 per cent resulting in high age dependency ratio. The youth, defined as 15 to 29 year olds in the Ethiopian context, account for 28% of the population (Ethiopian Youth Policy, 2004). With regard to spatial distribution as well, 16.7 per cent of the population lives in urban areas while 84.3 per cent are rural population residing mainly in densely populated highland settlements (CSA, 2008).

The issue of population and its impacts on the socio-economic development of Ethiopia has started to gain increasing attention since the great famine of 1984/85 (Seife-Selassie Ayalew, 2003), which has its trace on the country. It is only after this tragic phenomenon that population and problems related to it have become widely discussed. Cognizant of this fact, the country has made an attempt to formulate a national population policy in 1990 but, it is only in 1993 that the population policy of Ethiopia is realized notwithstanding its weak implementation to date. More recently, however, the Government of Ethiopian has given some attention to population and development linkages and population, unlike the country's previous poverty reduction strategies, now is considered as one of the eight pillars (PASDEP, 2006) in the government's development plan at least in blue prints.

[1] Human Development Index is an index that combines three dimensions: life expectancy at birth (as an index of population health and longevity); Knowledge and education (as measured by the adult literacy rate and the combined primary, secondary, and tertiary enrollment rate); and Standard of Living (measured by the GDP per capital at purchasing power parity).

1.2. PROBLEM STATEMENT

Research on demographic change is useful for policymakers in many ways. First, it is a predictive tool of population trends. Second, demographic change can provide beneficial conditions for development, offering a country the chance to set out on a path of rapid growth, but requiring policymakers to understand the trends and create a policy environment that takes maximum advantage of demographic potential. Demographic studies also offer a narrative about the challenges and policy priorities for building a better future (Bloom et al, 2001). Such studies are best when applied to the theory of demographic transition that deals with changes in age structure on the one hand, and the changing roles and aspirations of women on the other. Ethiopia then is one of the countries in SSA where studies related to population and development linkages are rare and demanding.

The age structure of the Ethiopian population has remained youthful for a long time now. The recent incipient fertility reductions, however, are beginning to slow down the growth of the youngest population whilst the number of elderly people is not yet important because of the small dimension of past cohort, and because of the relatively high level of adult mortality. CSA (1999) projected the dependency ratio to fall to 0.76 by the year 2015. The United Nation's Medium Variant Projection also put the figure to reach as low as 0.45 by 2050 (UN, 2009) further reinforcing the change in age structure of the Ethiopian population in the coming decades. Under these conditions, there is potential for Ethiopia to capture the demographic dividend that would be thrown open by the demographic transition process (Ringheim, et al, 2009).

Nonetheless, the demographic dividend does not last forever. Depending on a country's demo-economic situations such as the level of fertility, mortality, urbanization, economic development stage and policies on development and population sides, the period of the dividend differs from country to country. For example, the window period for China has lasted for over 30 years, from 1982 to 2013 (Fang and Mason, 2005); projected to take 40 years for Jordan (Bloom et al, 2001) and 55 years for Egypt (PRB, 2007) making clear the fact that there is a limited window of opportunity. The window period for Ethiopia is alleged to have started in 1995 (PRB, 2007) though no end date is set.

More importantly, the dividend is not automatic (Ross, 2004). While demographic pressures are eased wherever fertility falls, some countries will take better advantage of that than others. Some countries will act to capitalize upon the released resources and use them effectively, but others will not. The countries that benefited most from the demographic transition process, and subsequent dividend, are Korea, Singapore, Taiwan, Hong Kong, Thailand and Malaysia (Bloom and Williamson, 1997). The same study also revealed that, different parts of the world indeed took different advantage of the transition. For example, South America's demographic benefits were smaller than East Asians, although demographic contribution was almost identical to that of East Asian miracles.

Therefore without the right policy environment, countries will be too slow to adapt to their changing age structure and, at best, will miss an opportunity to secure high growth. At worst, where a shift in the age structure of the population is not matched by increased job opportunities, they will face costly penalties, such as rising unemployment and perhaps also high crime rates and political instability (Bloom et al, 2007). For example, between 1970 and 1999, countries with a very young age structure were four times as likely as those at the end of the demographic transition to have experienced outbreaks of civil conflict (Leahy, 2008/09). Particularly recent unrest in Greece, Iran, France and China has all been at least partly due to a lack of opportunities for young people (PRB, 2009).

Furthermore, the demographic transition is documented to bring forth two types of dividends. The first dividend is a persistent but ultimately transitory phenomenon that is brought about by the change in age structure alone. A second dividend, however, is also possible when the youth get decent job, entrepreneurial skill, healthy lifestyle, pecuniary benefits, and on-the-job training that would accrue and pass on to the future. Besides, as the transition advances there would be improvement in life expectancy and a population concentrated at older working ages and facing an extended period of retirement has a powerful incentive to accumulate assets, unless it is confident that its needs will be provided for by families or governments. Thus, the first dividend yields a transitory

bonus, and the second transforms that bonus into greater assets and sustainable development (Lee and Mason, 2006).

These outcomes are not automatic but depend on the design and implementation of effective policies on development and population sides. Faced with dual challenges from population and development front, the Government of Ethiopia has emphasized more on development without giving enough attention to issues of population control and population policy.

Among other this is indicated by the low in-country funding for Family planning service where the amount of in-country funding for family planning purchases between 2000 and 2010 is around USD 1.2 million (http://rhi.rhsupplies.org) while the government has spent USD 426 million for the purchase of fertilizer between 1996 and 2004 (NFIA, 2004; EEA, 2009). Moreover, there is a lack of programmatic detail for family planning services (USAID/ Health Policy Initiative, 2007) and the policy environment is not supported by public authorities such as the head of the government (USAID/HPI, 2009). From the institutional side as well, the dwindling in size & functions of the National Office of Population, the existence of a 17 years old population policy without evaluation and weak implementation on the one hand, and budgetary constraints on the other (Assefa and Sisay, 2003) are indicators for the lack of enough attention to population policy and family planning service provisions in this country.

1.3. OBJECTIVE

The general objective of this thesis is to examine the demographic transition process and the possibility of capturing the demographic dividend[2], as well as, suggest mechanisms to facilitate this possible opportunity. It also aims at informing (or alerting) government and other development partners what measures need to be taken in advance to expedite the demographic transition, and reap the demographic dividend. The specific objectives of the thesis therefore are:

- To review data and literatures on the relationship between population and socio-economic development in Ethiopia.
- To pin down the role fertility plays in boosting or compromising future population and development interactions in Ethiopia.
- To measure the size of the working age population and its demand for education, employment, health and other infrastructures in order to realize the emerging demographic potential.
- To look at the educational, training and employment situation in general and of youth and women in particular.
- To take lessons from the experience of other countries who pass through the demographic transition process.

[2] The **demographic dividend** is a rise in the rate of economic growth due to a rising share of working age people in a population. This usually occurs late in the demographic transition when the fertility rate falls and the youth dependency rate declines. During this demographic window of opportunity, output per capita rises. It has been argued that the demographic dividend played a role in the "economic miracles" of the East Asian Tigers

CHAPTER TWO

LITERATURE REVIEW

2.1. Theoretical Literature

2.1.1. Population Theories and Development Linkages

The most systematic and structured first assessment of the relationship between population and development dates back to the end of eighteen century when reverend Thomas Malthus in his book titled *First Essay on Population* posit that population would grow at geometric rate due mainly to lack of conscious restraint on fertility while food would grow at an arithmetic rate because of diminishing returns to increasingly scarce land. However, Malthus's prediction did not hold. Fortunately for the world and unfortunately for Malthus, couples did not breed without restraint but rather consciously managing fertility in response to changing conditions. Also, food was not a constraint, in the very geographic regions where Malthus focused his analysis, due to technological improvement.

The Malthusian model assumes that both population and technological changes are exogenous and attributed the economic backwardness in developing countries to the large size of population and its fast growth. Thus, population growth constrains per capital income to what is called the "Malthusian Trap" (Todaro and Smith, 2005) which is a low level subsistence, and if human population does not maintain conscious restraint on fertility, population growth will lead to increasing food unavailability and mortality. This theory has produced a profound influence on the formation of population policies in developing countries, asserting that the control of population growth is one of the initial conditions to get rid off backwardness through active intervention policies.

There is a counter hypothesis to Malthus's pessimistic account, namely Ester Boserup's (1981) thesis that densely settled populations provide motivation and resources necessary for technological breakthroughs. In line with this theory, the pressures of growing populations have probably stimulated large scale migration around the globe, the origins and spread of agriculture, the shortening of the fallow, irrigation, more recently the green

revolution and other developments that we associate with civilization in traditional preindustrial societies. In a related study of the population and resources linkages, Bilsborrow (1979; quoted in Panayotou, 2001) has categorized the multi-phasic responses revealed by human being to resource pressure as Demographic (change in nuptiality, decline in fertility), Economic (intensification of agriculture) and Demographic-Economic (out-migration).

There are contemporary advocates of neo Malthusian beliefs, though contrary to Malthus, who believed nothing much could be done to lower high fertility, and maintain that public policies, even regressive and coercive ones, should be used to lower fertility as quickly as possible. There are broad arrays of neo Malthusians, ranging from Paul Ehrlich's population bomb, Meadow's overshoot and collapse to demographers Davis (1967) who believe that the current world population is unsustainable.

On the other hand some scholars contradict the position held by the neo-Malthusians by appealing to human right. This group, mostly dominated by economists, argues that a coercive policy to change behavior is the most extreme example of an approach that makes no sense, since it compromises the current well-being and rights of individuals for a benefit to society as a whole that should in any way be discounted. The only real justification, according to them, for any intervention to change behavior is the existence of difference between the private and social costs and benefits of such behavior (Birdsall, 2001).

At the other end of the spectrum, there are also a small number of scholars and policy advocates who assume, following Boserup's arguments, that large populations will stimulate technological change and productivity. The most famous advocate of this position is Julian Simon, whose book; *The Ultimate Resource* (1981) argued that each person was a potential source of ingenuity and creativity. Societies with larger populations would be more likely to develop because of their larger number of potential scientists, inventors, and creative minds. Implicitly Simon argued that there is a limit to what one or two minds can think up and with increasing number of people; there is a tendency for inventions and innovations to flourish.

The International Conference on Population and Development (ICPD, 1994) held in Cairo emphasized the need to integrate population issues into economic and development strategies with the assumption that this will both speed up the pace of sustainable development and poverty alleviation and contribute to the achievement of population objectives and an improved quality of life of the population. The conference emphasized the need to integrate population issues into formulation, implementation, monitoring and evaluation of all policies and programs related to sustainable development at international, regional, national and local levels. It has also been noted that development strategies must realistically reflect both the short, medium and long-term implications of, and consequences for, population dynamics as well as patterns of production and consumption. In addition, it emphasized the priority of women's reproductive health and gender equality as most important policy goals rather than lowering population growth.

In the 1990s, there has been a shift in population debate back to the orthodox position that population growth has a negative impact on economic growth. This is exemplified by the 2001 collection of essays and empirical analysis in the book *Population Matters* (Birdsall, Kelley, and Sinding, 2001). The frequent oscillations in prevailing scientific wisdom of the impact of demographic factors on economic development reflect the complexity of the problem as well as the larger debate over the causes of economic growth, and the role population plays in that. For example, population growth creates more mouths to feed, but also more workers to produce. Larger populations, when weighed relative to fixed resources and capital, lead to lower per-capita welfare, but larger populations also create more demand and increased economies of scale. Again large population, while providing large labor force, it also is the source of demographic insecurity if not well taken care of.

2.1.2. Demographic Transition and the Potential for Development

Studies reveal that the demographic transition in Europe, East Asia and sub Saharan Africa are different. While it took more than a century and half for European countries to complete the transition, it took less than half a century for East Asian countries to do so. There are a number of possible explanations for this big gap; imported technologies that

have been developed and put in use in Europe, diffusion of new public health programs and techniques, increased agricultural productivity and trade in food.

Nevertheless, there is disagreement among scholars as to what caused fertility transition in Asian countries in the second half of the 20th century. Some argue that it is endogenous (economic growth induced declines) while other ague that it is exogenous (policy induced declines). The general view, however, seems that family planning programs have been central to the decline in Asian fertility beginning with India in 1951 (Bloom and Williamson, 1997).

Going beyond size and density a more sophisticated model of the relationship between population and economic growth focuses on the impact of age structure on savings. The most important research exemplar in this tradition was the one by Coale and Hoover (1958). According to them, high levels of fertility create a very youthful age structure with a high ratio of children to working age adults. If fertility were to be reduced, the change in the dependency ratio, following the demographic transition, would allow for a substantial diversion of economic resources from the care and maintenance of children to productive economic investment. The greater economic savings would occur at the household level as families with fewer children could afford to invest in more education and at the societal level with more state revenues becoming more available for investment in productive capital such as infrastructure, factories and research.

Even though high population growth may be a drag on rising living standards, as posited in Malthusian and neo Malthusian theories, many developing counties in East Asia were able to make rapid progress over the last few decades by having economic growth rates of 6 to 8 percent per annum (Bloom and Williamson, 1997) and this is partly explained by the growth rate of the economically active segment of the population more than the growth rate of the total population. This finding of positive relationships between population and economy in East Asian miracle countries is brought about by the demographic transition and subsequent change in age structure of these countries on the one hand and efforts made by governments to absorb the youth bulge in education, employment and technology on the other.

2.2. Empirical Literature

Despite the continued debate on population and development linkages on theoretical basis, empirical findings from around the world also make clear that issues of population, economic growth and development nexus need critical examination and scrutiny before hastily generalizing that population is an asset or liability. Among others, the region or specific country where the study is made, the time period the study considered, the quality of data and analytical techniques employed, demographic and development variables put into the analysis, are factors that determine population and development linkages.

Hussain et al. (2009) using data on demographic and economic variables analyzed the impact of demographic variables on economic growth in the context of Pakistan and found out that about 40 percent of the variation in GDP growth is explained by demographic variables included in the model. The evidence suggests that reduction in mortality will foster Economic Growth and Total Fertility Rate (TFR) has significant and negative impact on GDP growth rate while Wage Rate is positively and significantly related with GDP growth. A counter-intuitive result from their study is that the change in the age structure of the population and concomitant growth of the Labor Force is negatively related with GDP growth and attributed this to the fact that the economy is not absorbing the working age population into productive employment.

Fang and Dewen (2006) used data on demographic and development indicators and regressed growth rate of GDP per capital against the initial per capital GDP, Life Expectancy, Investment Ratio, Trade Openness, Government Expenditure and Dependency Ratio. Two of the five dependent variables included in the model are demographic that are directly related with the demographic transition process, and the results indicate that the marginal effect of the Total Dependency Ratio is negative and significant where a decrease in Dependency Ratio by one percentage point will cause Economic Growth by 0.115 percentage points. According to their findings, from 1982 to 2000 China's Total Dependency Ratio dropped by 20.1 percentage points, contributing to an equivalent of 2.3 percentage points to Economic Growth rate.

Savas (2008) come up with an interesting finding of long term relationship between population and real per capital income for Central Asian Countries. Using annual data for the period 1989 to 2007 and applying the Standard Granger type Causality test with a lagged Error Correction Term, the finding supports the existence of a long term relationship between Population and Per Capital Income, and provide a strong support for the hypothesis that population is driving growth.

Anorou and Braha (2004) using data from the World Development Indicators (WDI) examined the relationships between population and economic growth for Botswana where they applied the Co-integration analysis and Vector Error Correction Model to simultaneously abstract the short and long run information in the modeling. The results suggest that there is a long run relationship between Population and Economic Growth and population growth is found to Granger Cause economic growth. It is striking that population has positive impact for growth in an African country. The authors however recommended that a carefully formulated population growth strategy coupled with institutional and policy changes could engender Economic Growth. On the other hand a study in Ghana by Adijei (2002) indicated that rapid population growth has negative impact on provision of social services such as education, health and employment creation.

A study in Ethiopia (Daniel, 2003) using "Spectrum" Model found out that population does matter to economic growth and development though the degree and nature of the effect depend on a number of factors including; the level of economic growth prevailing in the country, the location in the demographic and age transition paths of the country and the existence of right policy environment and institutions. With regard to employment the same study found out that the country needs to create on average 1.8 million more new jobs per year in the period between 2000 and 2050 under the then most optimistic economic growth rate scenario of 4.5 percent and if fertility is to remain at TFR level of 5.9 as well.

This study in fact has some flaws. Some input data used for projection are flawed and it is a pessimistic type research where it took the unrealistic assumption of constant fertility

scenario whereby it assumed the Total Fertility Rate to remain at 5.9 for five decades. Moreover, it concentrates more on future problems and prospects of population and development interactions in Ethiopia without giving due attention to such linkages in the past. The paper also considers family planning service as a sole and exclusive remedy to cure the complex population-development puzzle that the country is in, thereby recommending meeting the Unmet Need for family planning services. Studies in other countries, however, reveal that unmet need is a poor proxy for family planning service effectiveness (Bongaarts and Watkins, 1996; Speizer, 2006) and there are community, household, family and individual level problems associated with contraceptive utilization.

Another study using the "Spectrum" Model by Senait Tibebu (2010) aim to provide information on the contribution of population to the realization of Ethiopia's long-term development plan, that is, the country's vision of reaching the level of middle-income country in the coming 20 to 30 years. The paper mainly focused on the long-term linkage between population and family planning and estimated the implications population has on education, health and family planning in the coming 25 years. It found out that if the economy is to grow by more than 10 percent in the next 25 years and if TFR is to reach replacement level by 2035, Ethiopia will likely join the middle income countries category in terms of per capital income. However, it overlooked other development issues such as unemployment, agricultural landlessness and production and consumption gaps that are severe and timely in developing countries like Ethiopia.

In line with this a World Bank report (2007) on Ethiopia states that the 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, fertilizer and improved seed remains limited, and over the past Fifteen years growth in agricultural GDP has barely kept pace with population growth despite recent signs of an upturn in agricultural output. Furthermore, data from MoFED (www.mofed.gov.et) makes clear that there is no strong correlation between agricultural growth and performance of the industry over the past decades regardless of government's

claim that the ADLI policy as successful and the backward and forward linkages agriculture and industry have in Ethiopia.

Interestingly, Boserupian types of responses are also happening, albeit with limited success so far. As argued by Ester Boserup (1981), increasing population pressure may generate the necessary condition to boost agricultural production, by changing the land-labor and capital-labor ratio, and thus the relative factor prices. The 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 Government of Ethiopia's effort to enhance the use of land saving technology such as modern farm input as well as its latest adaptation 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.

In general, data improvements in demographics (fertility, mortality, life expectancy) and development indicators (education, health, employment, labor force participation, per capital income, economic growth, agricultural land under cultivation) over the past decade on the one hand, and shortage of research on population and development interaction and the concentration of few existing studies on supply sides, ignoring the demand sides, on the other invited the researcher to study the relationship between population and development linkages in Ethiopia.

2.3. The Youth and Potential for Development

The share of youth in the world's population has already picked and will diminish globally between now and 2025. In developing countries, youth are about 29 percent of the total population and are declining as a proportion of the total population while still growing in absolute numbers, altering the landscape for many social and financial policy issues (Ashford et al, 2006; PRB, 2006). According to a report by Population Reference Bureau, the size of the youth in the world in 2006 was 1,773 million accounting for 27 percent of the population and is expected to reach to 1,845 million in 2025 which by then will be 23 percent (Nugent; PRB; 2009).

While most part of the world is aging, the proportion of population between 15 and 24 years in LDCs will continue to be higher than in MDCs. In 2005, young people represented 13.7 percent of the MDCs' population, 166 million. That share is expected to drop to 10.5 percent by 2050. Region wise, nearly one in five people living in the Middle East and North Africa (MENA) is between the ages of 15 and 24, and the number of youth in the region is unprecedented reaching as high as 95 million in 2005 (Assaad and Roudi-Fahimi, 2007). In general, the vast majority of the world's youth, 1.1 billion, are in LDCs. Sub-Saharan Africa has the world's most youthful population and is projected to stay that way for decades. In Ethiopia the population aged between 15-24 years alone is around 15 million that account for 19 percent of the total population (CSA, 2008). This is more than the total population size of Malawi or Djibouti, Eritrea and Benin put together (PRB, 2009).

According to Rachel Nugent (2009) in today's world, "growing up" is not what it used to be. The lives of youth today present a wide range of educational, family, employment, and health experiences that depart in major ways from those youths one or two generations ago. These different experiences can be attributed to the effects of globalization, technological advances, and widespread economic development. Youth spend a longer time in school, begin work at a later age, and get married and have children later than their counterparts did 20 years ago. They are also less likely to live in poverty, unless they are growing up in Sub-Saharan Africa, or parts of Eastern Europe or Central Asia.

2.3.1. Youth and Education

Educational attainment is a critical factor determining young people's future work opportunities, earnings, and contributions to society. More education at all ages, among both boys and girls, and across all regions since 1990, is paying dividends in many facets of their lives. However, youth in Africa are the most disadvantaged, with only 58 percent of boys and 53 percent of girls in 24 countries completing primary school. Further, by the time youth reach secondary school ages of 15 to 19, the proportion attending school drops off somewhat. In all developing countries, 61 percent of males and 57 percent of females are enrolled in secondary school. Gender wise, girls are less likely to continue

their schooling than boys, but the gender imbalance has improved in recent years (Rachel Nugent, 2009).

Despite the narrowing gender gap, low secondary school attendance among 15-to-19 year-olds is cause for concern. In some cases, the low attendance is due to a late start or slow progression through primary school, but in many countries the drop-off is really a drop-out and only a small percentage of teenagers will move on to secondary school. The reasons for the drop-off in school attendance differ somewhat for boys and girls, but work is a major factor, either within the household or outside. Families' inability to pay school fees and associated expenses becomes a greater factor at the secondary level. In addition, girls suffer from parents' unwillingness to send them to school, especially in cultures in which the return to parents' investment in education is uncertain or where marriage and motherhood are expected at an early age (PRB, 2009).

Over the last few decades, school enrollments have risen markedly throughout the Middle East and North Africa. Primary education is nearly universal in most countries and the gap between boys and girls' enrollments in secondary school has disappeared in many countries. Overall, the educational attainments in MENA today resemble those of East Asia in the early 1980s, with a broad base of primary and secondary graduates. MENA countries can successfully follow East Asia's progress in education by investing now in secondary education, reducing dropout rates, and investing appropriately in higher education (Assaad and Roudi-Fahimi, 2007).

Across Sub-Saharan Africa, 59 percent of young men aged 15 to 19 years work—young women are not far behind. The averages obscure wide differentials across Africa, where the most northern and most southern countries have much lower rates of young people at work. Work and school appear to be in conflict with each other in Africa, as high rates of school attendance coincide with low work activity in the north and the south; while low rates of school attendance combine with high levels of work in the rest of Africa. In other regions of the developing world, high levels of school enrollment coexist with a wide range of work patterns, but generally less than 50 percent of youth are working. This suggests that working for pay need not stand in the way of getting an education, but in

poor conditions may slow or prevent educational achievement and eventually social progress (Rachel Nugent, 2009).

2.3.2. The Youth and Unemployment

Globally the youth are more prone to unemployment problems than adults or the elderly are, and the problem is different in magnitude and nature between and within different regions of the world. For example, the unemployment rate among youth in MENA ranges from more than 40 percent in Algeria and Palestinians living in the West Bank and Gaza to 6 percent in the United Arab Emirates. The share of youth among the unemployed in the region ranges from about one-third in the Palestinian Territories to three-quarters in Syria. Also a recent analysis in Egypt has shown that the highest rates of unemployment have now shifted to university graduates. There are two reasons for this shift: University students were the fastest-growing group among new entrants and the group most dependent on government employment, which is not growing as fast or might even be shrinking (Assaad and Roudi-Fahimi, 2007).

The problem of unemployment is also severe in Sub-Sahara African countries and many African countries will experience marked growth in the working-age share of the population between 2005 and 2025, but not all have strong institutions and economies to take advantage of the bulge in workers. A few countries experiencing such growth, such as Ghana and Namibia also have relatively strong institutions and thus may be poised to start capturing the demographic dividend (Bloom et al., 2007). Other African countries will see somewhat slower increases in the share of the working-age population, and a few countries (such as Uganda) will not see the working-age share of the total population rise above 50 percent for a few decades because fertility is still very high (Ashford, 2007).

Thus, Ethiopia is not alone in Africa in confronting a high level of youth unemployment; the number of youths who remained unemployed in absolute terms is a cause for concern however. The demographic transition from high fertility-high mortality to low-fertility and longer life expectancies implies a spike in the dependency ratio. Young entrants to the labor market, who are generally better educated than their parents and have higher expectations for employment, face difficulty securing jobs in many parts of the world.

Ethiopia is at the incipient stage of the demographic transition where fertility rate is relatively high, despite recent declining trends, and population continues to grow at a rapid pace. Particularly as land degradation and scarcity act as push factors for migration from rural to urban areas, urban youth unemployment is becoming an increasingly major concern (World Bank, 2007).

The same study by the World Bank states that the performance of urban labor markets in Ethiopia has been disappointing, even with the acceleration in growth in recent years. Jobs growth has been slow, and way below what is needed to productively employ urban residents looking for work; unemployment is thus high. Even for those who have income earning opportunities, these are typically in the informal sector and very low paid. Compounding the challenges of sluggish job creation and low pay are the particular disadvantages faced by the youth in general and women in particular.

CHAPTER THREE

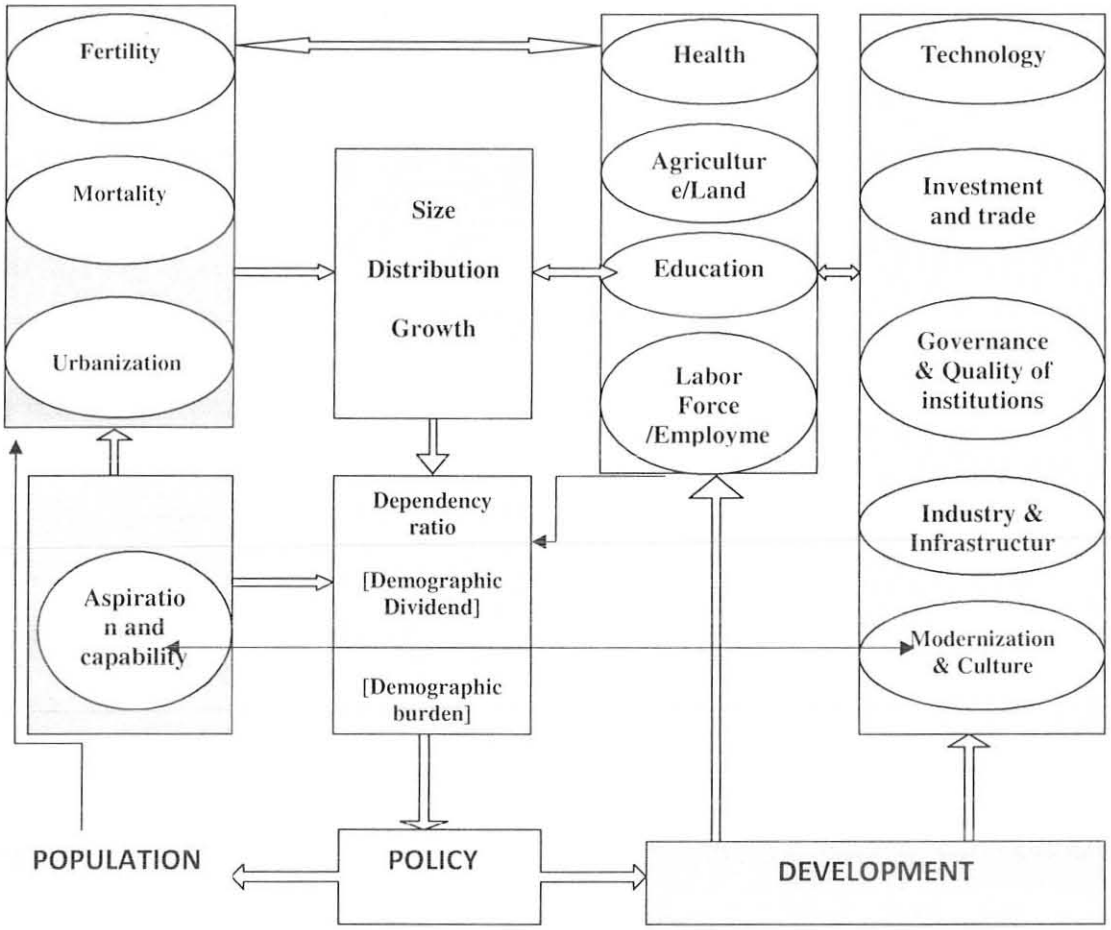
METHODOLOGY

3.1. CONCEPTUAL FRAMEWORK

Policies are among plan or course of action of a government intended to influence and determine decisions, actions, and other matters to achieve a goal or program tailored towards improving human well-being or raising standards of living. Favorable policies need time to establish and take effect. The same holds true for policies on the dynamic population and development linkages. The mere existence of well-designed policies, however, does not guarantee improved standards of living or achievement of targeted goals for that matter. More important is the existence of well organized, functional and quality institutions that are capable of implementing the policies so designed. The conceptual framework below therefore is meant to illustrate the interplay between demographics and other development variables in a dynamic context through considering demand and supply sides.

While high population growth, due to decline in mortality rate, 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.

Figure 1: Conceptual framework on the dynamic linkages between population and development variables.



Source: developed by the author based on literature

Lessons from East Asian economic miracles provide the best evidence of the potential impact of the demographic dividend. As early as the 1950s, countries in this region developed strong public health systems that ensured child survival, promoted smaller families, and made contraception acceptable and easy to obtain (Bloom and Williamson, 1997). A strong educational system, sound economic management and well-built institutions made it possible to absorb large generation of young adults into the workforce. Therefore, taking a lesson from them, key policy actions needed throughout Sub-Saharan Africa in general and in Ethiopia in particular are those that expand youth opportunities (employment), give them the skills to participate fully in economy and public life (training and education), encourage them to value culture and transform it into

tangible asset (aspiration and capabilities), remove barriers that stand in their way from maximizing their potential, promote healthy behaviors (health) and equip them with technology.

Technology assists a country to expedite the transition and reap the dividend in many ways. However, technology is also costly depending on the type of technology used. Among others, technology eases the cost and time of reaching rural and remote areas to provide educational and health services. Communication technologies can also be employed to diffuse information and increase and/or create awareness on the importance of small family size. In that way, technology would ease government's fiscal pressure. Adopting labor intensive technology to absorbing labor force and add value to country's export items on the one hand and employing modern farm technologies to agriculture on the other, improves production and productivity. Furthermore, technology enables a nation to integrate itself with the changing and dynamic global system.

The rural-urban linkages and subsequent economic development of Western Europe and the United States was closely associated with, and in fact defined in terms of, the movement of labor from rural to urban areas through the gradual relocation of labor out of agriculture to industry (Todaro, 1976). While there is significant dispersion in the degree to which countries have urbanized during their development process, a strong negative association can be found in cross-country data between income levels and share of population in rural areas. Migration can therefore play a major role in fostering growth and poverty reduction, by reallocating resources more efficiently both geographically and sectorally across the economy. China offers a spectacular example of the transforming role of migration where an estimated 16 percent of GDP growth over the period 1987-2005 has been contributed by migration (World Bank, 2007).

Migration is age selective where most migrants tend to be young and concentrated in the most productive age groups. Hence encouraging migration to less crowded towns and urban areas, as oppose to the objective specified in the 1993 population policy of Ethiopia, while improving the absorptive capacity of industrial and service sectors at the

same time, can assist Ethiopia to reduce rural poverty and improve the prospects of the upcoming demographic potential.

Ethiopia is one of the countries in Sub Sahara Africa that made slight decline in fertility (where fertility went down from 6.4 in 1990 to 5.4 in 2005) and is at the incipient stage of the demographic transition (See Annex I, Page-82). And demographic transition theory dictates that with declining mortality, especially infant and child mortality, fertility declines as parents become more and more confident that the child they bear survives long. At the onset of the transition, when population growth takes off in response to decline in child mortality, the young (less than 15 years) age dependency ratio increases, yielding relatively fewer workers, while demand for social services, especially education and health, and thus fiscal pressures increase thereby hampering economic growth and/or social development. Later, when followed by rapid decline in fertility, population growth will slow down, dependency ratios will decline, young people reaching working age will boost labor force, and savings and investment rates may increase.

Even when the above conditions are met, the dividend might not be fully realized because supply side policies or intervention will not be fruitful unless the youth (15-29 years olds) reveal their preference and are capable of utilizing the social services so provided. In a study related to this Ophtat (2009) states that motivations and beliefs in one's abilities to affect change in their life, which are developed during adolescence, have major consequences on adult well-being outcomes.

As a result when there is a shift in social structure, for example, massive expansion in educational opportunities, the question that remain is: to what extent does an individual's life course agency influence his/her ability to navigate through those changes and benefit from them in the face of socio-cultural constraint? Therefore in addition to supply side interventions, policies that influence the socio-cultural values and norms of the country/community including national and regional family law on age at first marriage, harmful traditional practices and women's right play crucial role in eroding the prevalent detrimental practices and mount the likelihood of countries to benefit from demographic potential.

3.2. Data Type and Sources of Data

The data used in this thesis are secondary and are derived from sources including: CSA (Census reports, 1984, 1994 and 2007; National Family and Fertility Survey, 1990; National Labor Force Survey, 1999, 2005; Urban Employment and Unemployment Survey 2003, 2004, 2009; Ethiopian Demographic and Health Survey, 2000, 2005), Ministry of Education's Statistical Abstracts (2002, 2008, 2009), Ministry of Health (2000, 2002, 2003, 2004, 2005), MoFED (2006), EEA/EEPRI Data Base CD-ROM (2009), the United Nation's World Population Prospects: the 2008 Revision (2009), World Bank Development Indicators (2009, 2010) and research studies at national, regional and global levels.

While trends of population and development variables and their interactions thereof for past years are taken from the above sources, to project future changes in population structure and commensurate demand for social services, the "Spectrum" software is employed. Spectrum is a window based system of integrated policy models. The integration is based on DemProj, which is used to create the population projection that support many of the calculation in the other components-FamPlan, Cost Benefit, AIM and RAPID. It is a model that analyzes existing information to determine the future consequences of today's population program and policies (Future Group International, 1999). Thus Demproj is employed to project the Ethiopian Population from 1994 to 2050, while the RAPID software is used to bring population and development variables together for the period stated. Input data for demographic and development variables are fed into the Spectrum Model using three fertility scenarios; Fast, Medium and Slow Fertility Decline.

The Fertility assumptions are based on the United Nation's Projection, National targets set in the PASDEP document as well as in the 1993 Population Policy and Ethiopia's achievement in reducing fertility rates in the past. Accordingly, under the Fast Fertility Decline assumption the country will reach a Total Fertility Rate (TFR) of 4.00 in 2015 (MoFED, 2006), 2.65 in 2030 and 1.69 in 2050 (UN, 2009) and a Replacement Level Fertility of 2.1 by 2035. Medium Fertility Assumption uses a Total Fertility Rate (TFR) of 3.25 and 2.19 respectively for the years 2030 and 2050 (UN, 2009). The Slow fertility

decline assumption on the other hand is based on slow fertility decline achievement of Ethiopia over the period 1990 to 2000 which coincides with the 2008 revised UN's High Variant Fertility, i.e. TFR of 3.75 by the year 2030 and 3.45 by the year 2035 and 2.69 by 2050.

The population projected under the above assumptions is linked with GDP and is related with the country's future to see the upcoming population and development linkages. The most optimistic scenario assumption of 10.1 percent economic growth is also assumed to be maintained in the coming four decades. The effect of demographic variables on socio-economic attainment are measured using development variables such as education, health, New jobs required, Per capital arable land, production and consumption gap in major agricultural crops and per capital GDP.

3.3. Measurements and definitions of variables

Labor force participation and unemployment rates used in this analysis are based on the "current" activity status approach rather than the "usual" one. The former measures the economic activity status in relation to a short reference period, that is, the seven days prior to the date of interview while the latter measures productive activities during most of the previous six months (CSA, 2009). Those populations aged ten years and over were presented with questions and the replies are used to divide them into three mutually exclusive categories: employed, unemployed and not in the labor force. The employed and the unemployed population together make up the labor force. On the other hand, individuals who were not engaged in productive activities such as those involved in homemaking activities, attending education, illness, old aged/pensioned etc. are classified as economically inactive populations.

The study is also based on the "relaxed" or broad definition of unemployment where it considers persons without work and who are available for work, including those who were or were not looking for work. The seeking work criterion is completely relaxed and unemployment is based on the "without work" and availability criterion only. The availability is tested by asking the willingness to take up wok for salary or wage in

locally prevailing terms, or readiness to undertake self employment activity, given the necessary resources and facilities (CSA, 2009).

The rationale behind using the broad definition of unemployment includes: low labor demand in the formal sector; saturated informal sector in the country implicitly discouraging workers (i.e., many informal sector activities are saturated such that expected earning are low enough that many remain unemployed or become discouraged workers); and also the long term unemployment that prevail in the country which discourage workers from actively searching for work (WB, 2007).

Educational attainments at primary and secondary levels are measured using the Gross Enrollment Rates (GER); Net Enrollment Rates (NER) and Gender Gap in Education. Gross Enrollment Rate for primary level is the percentage of total enrollment in primary schools, irrespective of age, out of the corresponding primary school age population, that is, ages 7-14. GER is a crude measure of school coverage. Usually, since it includes under aged and over-aged pupils, GER can be higher than 100 per cent (MOE, 2008), and frequently is in countries attempting to address the backlog of students interested in attending school.

Secondary GER compares those students, regardless of age, with the population of the appropriate age range. For Ethiopia, the ages for first cycle secondary (General Secondary) would be 15-16, and that for second cycle, 17-18 years of age. As with Primary Net Enrollment Rate, the Secondary Net Enrollment Rate measures the enrollment of children of the appropriate age (for first cycle, 15-16 years old) divided by the population of that age (MOE, 2008). Net Enrollment Rates are ideally 100%, but for secondary this is seldom achieved. Very low NER suggests a large number of over-aged students enrolled.

3.4. Input Data for Spectrum Projection

The following data are used in the Spectrum software. For "Economy": labor force participation rate for males and females separately by age group of 10-14 and 15-64, the base year GDP and annual growth rate of GDP. For "Education": age at entry into

primary (secondary) school, number of years of primary (secondary) school, enrollment rate at primary and secondary, students per teacher in primary and secondary, students per school at primary and secondary and recurrent expenditure per primary (secondary) school student. For "Health": population per doctor, population per nurse, population per health center, population per hospital, population per hospital bed and annual health expenditure per person. For "urbanization": percent of urban population in major city, persons per urban household and urbanization level. For "Agriculture": arable land, base year production of major crops, annual growth in production of major crops and annual per capital consumption of major crops. The input data and the assumptions taken are indicated in (Annex VII, page 88).

3.4. LIMITATIONS

The RAPID model used to link population projections with the demand for socio-economic services does not consider reciprocal causality, i.e., it does not show the backward impact development variables have on demographic variables, and hence on controlling fertility. Moreover, the model does not give room for projections of variables such as energy demand and transport services which are timely and severe issues in countries like Ethiopia. It also gives no room for the role technology plays in encouraging or confronting the future population development linkages.

CHAPTER FOUR

4.1. FINDINGS AND DISCUSSION

The Ethiopian National Population Policy 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 (NPPE, 1993).

According to a recent World Bank report the focus so far has been largely on the first factor, that is fostering shared growth and enhancing gender equity by advancing female education (World Bank, 2007). Furthermore a report from MoFED (2006) states that "under PASDEP, greater emphasis will be given to girls' education and to fight against harmful traditional practices, as they are essential for the population policy to meet its objectives". Despite very recent improvements in expansion of family planning services (and the belatedly inclusion of population as one pillar of development thereof), a recent study (USAID/HPI, 2009) show that the policy environment is not supported by public statements from higher authorities such as head of government, and the amount of in country funding for family planning is limited.

Another recent study on incorporating family planning programs into poverty reduction strategy papers put Ethiopia among countries with PRSPs that do mention family planning but do not provide programmatic details (USAID/ Health Policy Initiative, 2007) while Ghana and Côte d'Ivoire are among countries that include specific details about family planning, such as financing, logistics, quality of service, and/or awareness-raising campaigns.

Furthermore, from the institutional sides as well, studies (Assefa and Sisay, 2003; Assefa et al., 2010) listed the major constraints and challenges that affected and impeded the implementation of the National Population Policy of Ethiopia. Among others, (1) lack of legal basis for the establishment of various offices including the National Office of

Population (NOP) both at federal and regional levels; (2) failure to establish the National Population Council (NPC) which was supposed to have the overall responsibility to guide and coordinate the population policy and programs; (3) weak or inexistence monitoring and evaluation framework to measure the impacts of development interventions; and (4) budgetary constraints are mentioned as bottlenecks.

These are indirect witnesses that the issue of population control does not receive sufficient attention in development efforts in Ethiopia. Implicitly then the Government of Ethiopia seems to be preoccupied by the conventional wisdom that consider "Development" as "the best contraceptive" and/or economic development models that regard population as one variable of growth thereby ignoring the role of population policies in development planning. Furthermore it sounds that the government believes in the standard economic theories of fertility that argue, on theoretical grounds, that socio-economic development will bring fertility down. However, the explanatory power of the standard economic theory of fertility, and development for that matter, on fertility transitions is very weak or nonexistent; particularly in countries alike Ethiopia where literacy is low, fertility and mortality rates are relatively higher and poverty is pervasive.

This lack of sufficient attention to population control in Ethiopia is partly reflected in the lack of rigorous evaluation of the 17 years old population policy, the dwindling in size and functions of the National Office of Population from the office of the prime minister to department level at Ministry of Finance and Economic Development (MoFED), the weak implementation of strategies articulated in the population policy or the lack of quality institutions to do so, the limited in country funding for family planning services, the lack of political commitment from higher government officials and the discrepancy between family planning rhetoric and inclusion of it in poverty reduction strategies as discussed above.

However, population projection using fast, medium and slow fertility declining assumptions reveal that there are enormous benefits that the country could drive from controlling population growth, including the prospect of joining the so called Middle-Income Countries in late 2030s or early 2040s as indicated in the sections below.

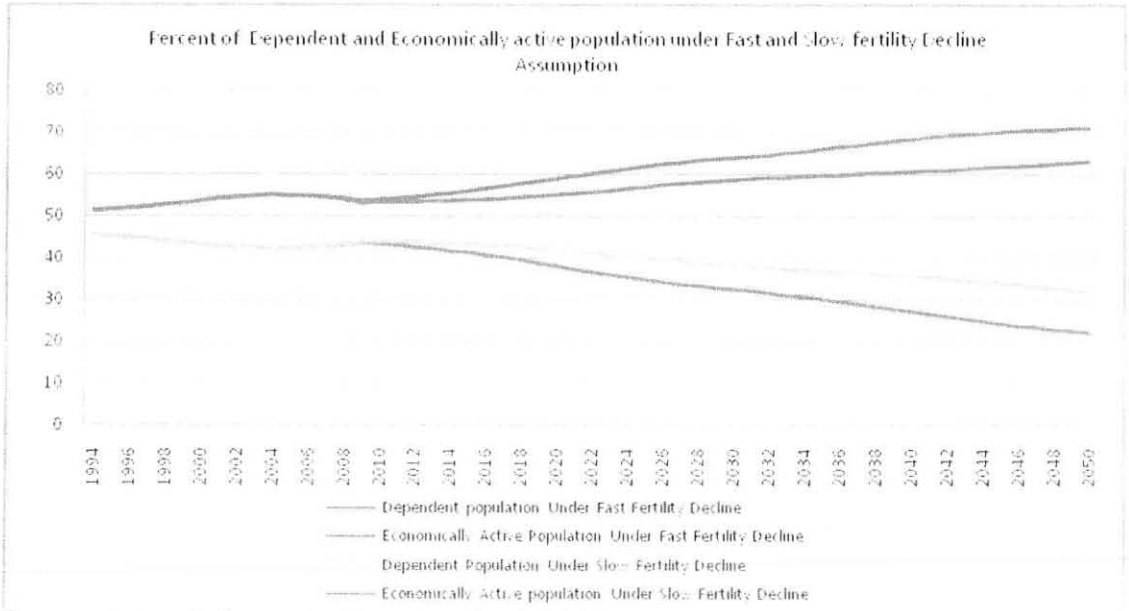
4.1.1 Ethiopia's Demographic Profile: Past and Future

The dividend is assumed to be obtained when growth rate of the economically active population is greater than the growth rate of the total population. Therefore, the author measures the dividend using dependency ratio or support ratio as a standard unit. Although there was no significant change in the age structure of the Ethiopian population over the past 13 years (1994-2007), projections using the spectrum model reveal that there will be a significant shift in the age structure of the Ethiopian population in the coming four decades.

Depending on which fertility path Ethiopia is to take, the country's population will show significant difference in size and structure in the years to come. Under the fast declining fertility scenario, for example, the population size of Ethiopia will reach around 140 million in 2040 while it will be 165 and 175 million respectively under the medium and slow declining fertility assumption in the same year (See Annex II, page-83). A population difference of 35 million, which almost equals the current population size of Algeria, will be observed between the fast and slow fertility assumptions. Past data on Ethiopian population also verify that the country's population has increased by 47 million over the past 30 years from around 36 million in 1980 to 83 in 2010.

Going beyond size, the difference in fertility will have considerable effect on the age structure of Ethiopian population. This is depicted in figure (2) below that show the percentage differences in population age structure, which in turn reveal the difference in dependency ratios under the fast and slow fertility decline assumptions. Under the slow fertility declining assumption, for instance, the age structure will remain youth dominated as the percentage of dependents (less than 15 years) would show no significant decline, neither will the economically active (15-64 years) segment of the population show significant increase in the face of massive increase in absolute population size.

Figure 2: 1994 actual[3] and projections of age structure and dependency, 2007-2050, using the Fast and Slow declining Fertility assumptions of the Spectrum



Source: Author's Projection Based on the 1994 Census Data

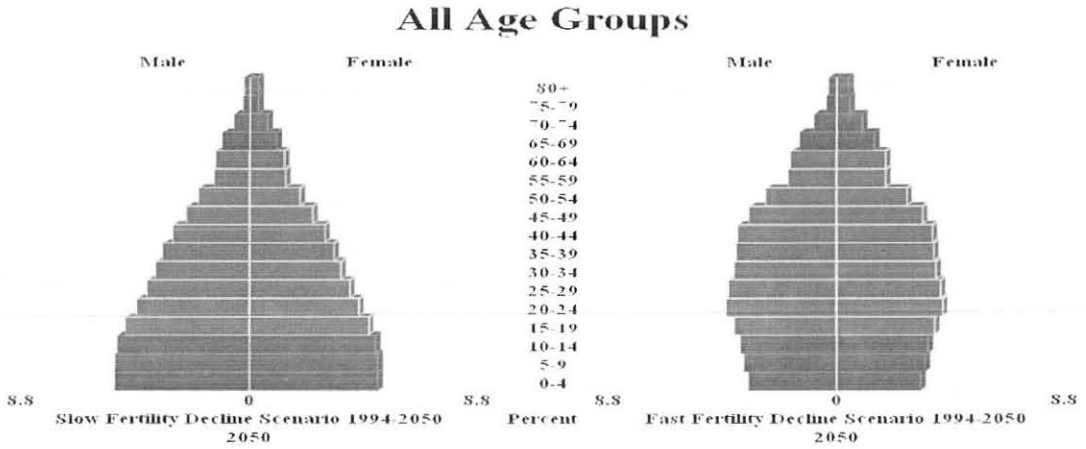
The age dependency ratio as of 1984 was 0.112 (CSA, 1991) implying that for every 100 working people in the economy there were about 112 dependents to cater for. The respective figures for the 1994 and 2007 censuses were 0.95 and 0.91(CSA, 1999; CSA, 2008) respectively indicating a slight decline in dependency ratio. These figures however conceal large amount of information as they do not take into account the existing huge size of unemployment in the economy. If one has to consider unemployment rate in the economy, the magnitude of actual dependency would be higher than these figures suggest.

Ethiopia's demographic outlook is expected to be different however, and under the fast fertility decline assumption, age dependency ratio will decline by half from its level of 0.95 in 1994 to 0.47 by the year 2040 (See Annex V, Page 86) and two people in the working age group are theoretically expected to support one dependent only, reducing the burden by half. Under the slow fertility decline assumption, on the other hand, the result

[3] The Ethiopian 2007 census triggered debate home and abroad as to its credibility. For instance the parliament debated on the reliability of the census result for Amhara region and Addis Ababa city Administration while the United Nations Revision of 2008 world Population considered the 2007 census as under enumeration of 6.1 percent. In situations like these, the author dwells mostly on the 1994 census and other National surveys for analysis.

is otherwise and age dependency ratio will not decline significantly and remains at 0.64 without notably easing out the age dependency burden. The fertility paths to be pursued and subsequent change in size and age structure of the Ethiopian population are shown in figures (3 & 4) below for the year 2050.

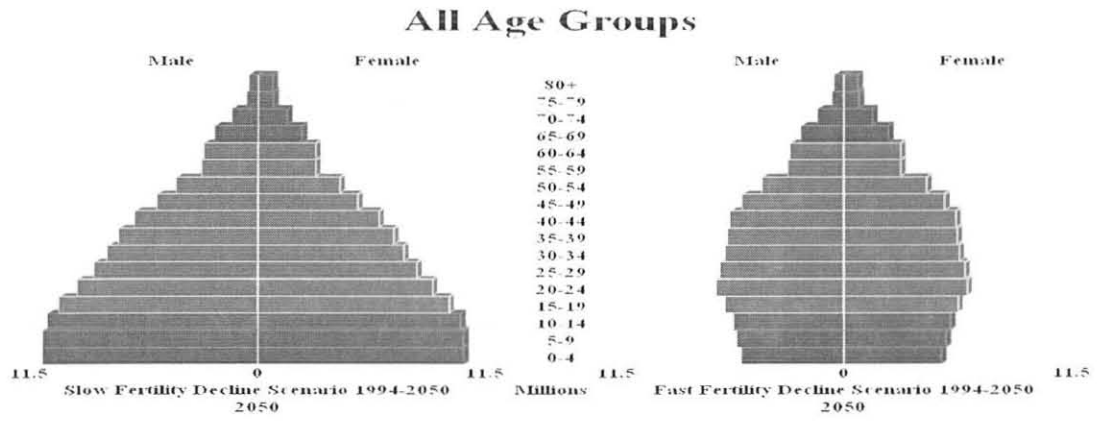
Figure 3: Population pyramid of all age groups (percent) of Ethiopia under Slow and Fast declining Fertility assumptions, 2050.



Source: Author's Projection Based on the 1994 Census Data

Hence, the dual advantages to be driven from reducing fertility are (1) considerable shift in the age structure as shown in the pyramid above (Figure 3). That is, under the slow fertility decline scenario by 2030 the age dependency ratio will be 0.70 while it is 0.56 under the fast declining fertility assumption. (2) Huge difference in population size (Figure 4) depending on the fertility assumptions taken, fast and slow declining fertility assumption in this case. Hence, the population size of Ethiopia in 2030 under the slow and fast fertility decline scenarios will reach 141 million and 123 million respectively showing a difference of 18 million people.

Figure 4: Population pyramid of all age groups (size) of Ethiopia under Slow and Fast declining Fertility assumptions, 2050.



Source: Author's Projection Based on the 1994 Census Data

Latent in changing age structure and diminishing family size, there is a change in the status of women as well. As fertility declines child bearing and rearing take smaller proportion of women's time leaving them free to pursue other previously unattainable activities such as education and employment (McNay, 2003). With fewer family size girls' prospect for receiving quality education (without discrimination) also increases as there is enough resource to go around, and share with boys. They also are freed from the drudgeries of life and are relieved of their poorly rewarded multiple responsibilities such as taking care of younger siblings, fetching water, milking, collecting fire wood and other domestic and child labor. These developments in turn will have reciprocal effect on fertility reduction and gradually improves the quality of life of individuals, community and the nation as a whole.

Nonetheless, the changing age structure that is brought about by fertility transition is a window of opportunity rather than a guarantee of improved standards of living by itself. Yet, it creates a potential for development when coupled with measures made in areas other than population. An in-depth analysis of the population development linkages in Ethiopia over the past 15 to 20 years, where data is available, witness that there are some progresses in development areas, but a lot remains to be done. This is evident in the country's progress in terms of employment, education and other indicators as shown below.

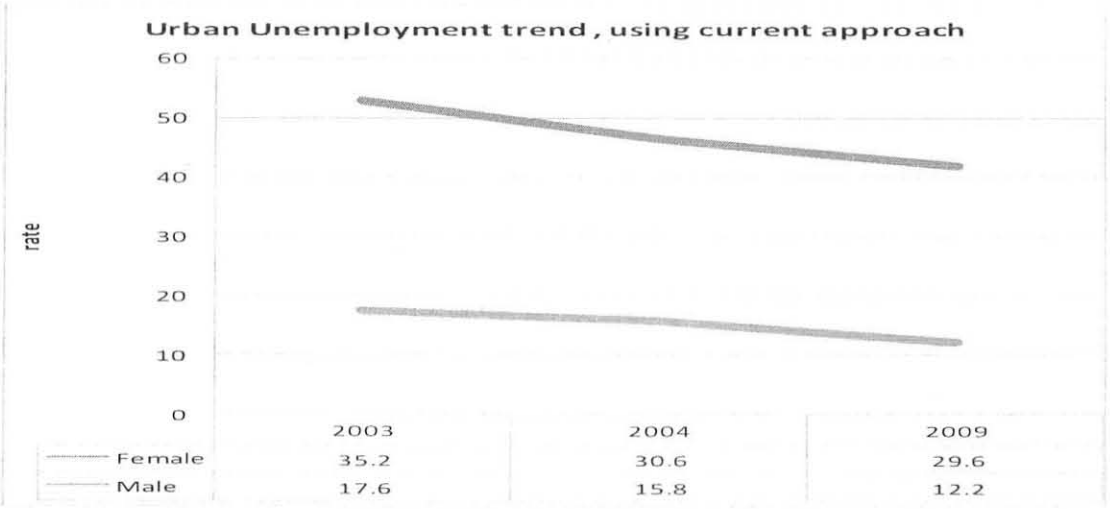
4.1.2. Urban Unemployment

Data are compared from the 1999 and 2005 National Labor Force Surveys (NLFS), and the 2003, 2004 and 2009 Urban Employment and Unemployment Surveys (UEUS). The former showed that there is some decline in unemployment rate at national level between 1999 and 2005 where unemployment rate for the total country was 8.0 percent in 1999 (NLFS, 2000) and declined to 5 percent in 2005 (NLFS, 2006). On the other hand data for urban Ethiopia showed relatively stable levels between 2003 and 2009; slightly changing from 26.1 percent in 2003; to 22.9 percent in 2004 and to 20.4 percent in 2009 (UEUS, 2003, 2004, 2009).

There is a huge disparity in unemployment rate in urban and rural Ethiopia and unemployment is more severe in urban areas. For example unemployment rate in 2005 in urban Ethiopia was 20.6 while it was 2.6 for rural Ethiopia (NLFS, 2006). However, the problem of urban unemployment in Ethiopia is partly an outgrowth of the population structure and geographical distribution that is mainly rural.

A study by the World Bank showed that Ethiopia's urban labor supply has been growing at a sustained annual pace of 3.5 percent, partly due to internal migration (World Bank, 2007). Further increases can be expected due to population pressures on land and environmental degradation in rural areas, the momentum of the development process itself and the high urbanization rate of around 4% (CSA, 2008). Longer term determinants such as "regional imbalances in employment opportunity, improved communications, road and transport networks and changing aspirations of the younger generation" (Deshingkar 2005) also are reasons for the increase in urban labor force. In the absence of a recent census it is hard to quantify, but there are concerns about absorption into the urban economy, and downward pressures on wages of the local unskilled population (World Bank, 2007).

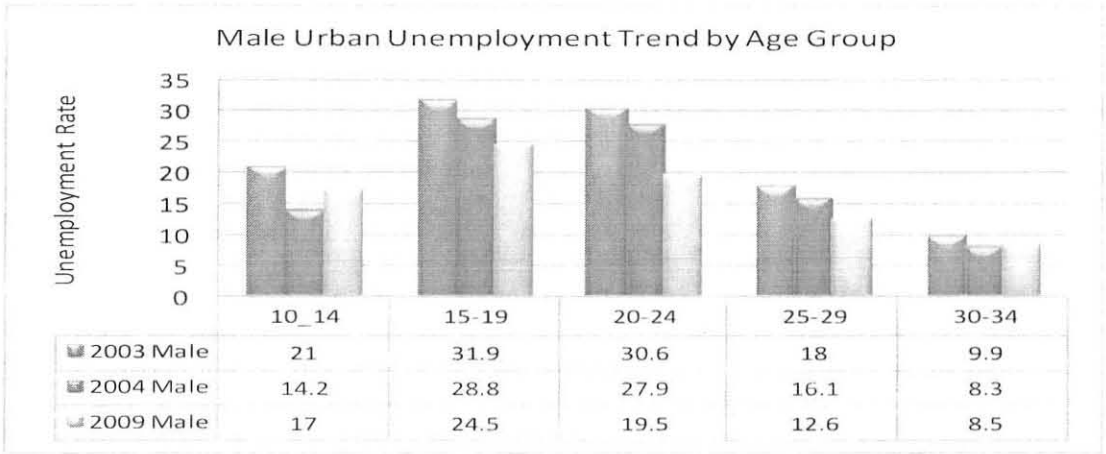
Figure 5: Urban Unemployment trend in Ethiopia by sex using the current approach



Source: Author's compilation from CSA, Urban Employment and Unemploymnent Survey, 2003, 2004 and 2009

Despite the relatively stable and higher unemployment level in urban Ethiopia over the past decade as shown in figure (5) above, disaggregating it by sex and age reveals that, the youth (15-29 years) in general and females in particular take the disproportionate share of the problem. This is illustrated in figures (6a and 6b) below.

Figure 6 (a): Male Urban unemployment trend in Ethiopia by Sex and Age Group using current approach



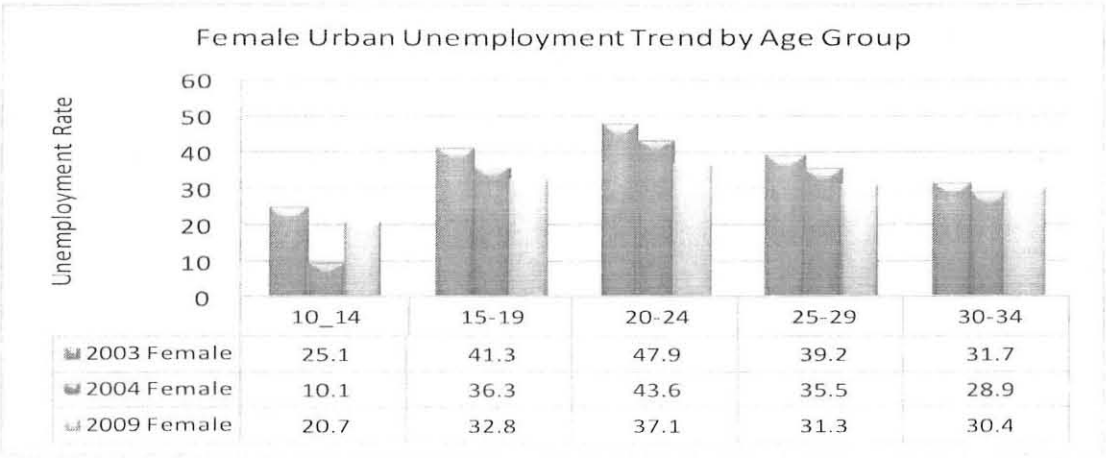
Sources: Compiled by the author from CSA's Urban Employment and Unemployment Surveys, 2003, 2004 and 2009

In general, females are two times more likely to be unemployed than males. The problem is even severe when we consider females in the age bracket of 20-29 where female

unemployment rates stay high (above 30 per cent) from 15-19 through 25-29, while male rates, which are almost as high as 17.6 in the 15-19 age category, decline to nearly 12 percent by age 25-29.

The decline in male unemployment rate is not only with the age of the person, but there is also dramatic decline in male unemployment rate over time where it went down to 12.2 percent in 2009 from 18 percent in 2003. Unemployment rate for females, on the other hand, remained significantly higher than that of males for different age groups. Also, the level remained above 30 percent from 2003 through 2009 with no major decline as shown in figure (6b) below.

Figure 6 (b): Female Urban unemployment trend in Ethiopia by Sex and Age Group using current approach



	10_14	15-19	20-24	25-29	30-34
2003 Female	25.1	41.3	47.9	39.2	31.7
2004 Female	10.1	36.3	43.6	35.5	28.9
2009 Female	20.7	32.8	37.1	31.3	30.4

Sources: Compiled by the author from CSA's Urban Employment and Unemployment Surveys, 2003, 2004 and 2009

There is no a single major culprit to blame for the high rate of unemployment in urban Ethiopia. Review of existing literature on youth and unemployment reveal that unemployment is an outgrowth of demand and supply side problems. Among other things the following are reasons for high rate of unemployment in urban Ethiopia. (1) the definition of unemployment used by CSA (World Bank, 2007), (2) the unprecedented growth rate of the (urban) population, (3) low skill and entrepreneurial capacity of the youth (Getnet, 2001), (4) sluggish growth and job creation performance of the economy (Ethiopian Economic Association, 2005/06), (5) growing youth/adult labor force in need of employment, (6) rigid labor market and institutional policies (Berhanu et al, 2005/06),

(7) high aspiration on the part of the youth for well paid public sector job, (8) lack of social status for "bad" jobs, (9) and external selection criteria (such as social networks working only after one actually become unemployed) implicitly encouraging the youth to remain unemployed rather than take up a temporary job (Serneels, 2004)

Comparable data from the 1994 Census and the 2005 NLFS reveals that the labor force participation rate of females in the working age group has increased from 63.6 in 1994 to 75.2 percent by the year 2005 while male participation remained at higher rates (82.3 and 85.4). The dramatic increase in participation of women between 1999 and 2005 is partly explained by the rising cost of living, forcing usual female homemakers, often discouraged from working, to have to consider working. Other possible explanations for the growing gender gap in youth unemployment in urban Ethiopia include: greater skills training of males, cultural barriers to women's working and government's urban job creation programs which favor males, especially the construction boom that is going on in urban areas.

In addition to the wide gender and age disparity, urban unemployment rate is high in absolute terms. Part of the problem lies in the education system. The low educational quality did not equip graduates with the necessary skill and expertise to fit to the existing jobs, nor would it make them real entrepreneurs to establish and run their own businesses. One study shows that the mismatch between the skill requirements of the labor market and the education/training skills of the youth (i.e., mismatch between demand and supply) is one factor held responsible for the high and persistent levels of unemployment in urban Ethiopia (Getnet, 2001). Other reason in relation to the educational system that contributed to youth unemployment is the legacy of the past educational system with excessively academic orientation creating the wrong kind of attitude and job expectation on the part of the youth, including the preference for white-collar jobs as opposed to agricultural and manual work (Berhanu et al, 2005).

Cognizant of the severe unemployment problem the government of Ethiopia has launched Technical and Vocational Training and Education (TVET) program in the late 1990s with the objective of producing and supplying well trained and qualified labor force in the

labor market as per the demands of the employer (MoE, 2006/07). Even if these TVET institutions increased the number of graduates, time and again there is a high mismatch between the demand and supply of labor. One source of this mismatch between demand and supply is the absence of appropriate market survey by TVET institutions as to which field of study is currently needed by employer organization; another is due to the non-involvement of different stakeholders such as parents, Employer organizations and Civic Societies in the design and implementation of TVET programs.

Furthermore, in a comparative study of government and non-government TVET institutions Alemu, (2000) found significant quality differences. The graduates from the sampled non-government schools had a significantly higher *un*employment rate. Respondents from the two types of TVET schools also expressed different views on what were the major problems that hindered the implementation of vocational programs. Those from government schools identified lack of facilities, absence of occupational information and public relation service while respondents from non-government schools considered as main problems, low absorptive capacity of the companies, and duplication of training areas and absence of accreditation services.

4.1.3. Population Growth, Labor Force Potential and Demand for New Jobs

Assumptions: The underlying assumptions under this section are:

- Reducing the labor force participation rate of Males $_{(10\text{-}14)}$ to 25% by the year 2035 and onwards from its level of 52% in 1999. The parallel assumption for Females $_{(10\text{-}14)}$ is to reduce it to 20% from its level of 38% in 1999.

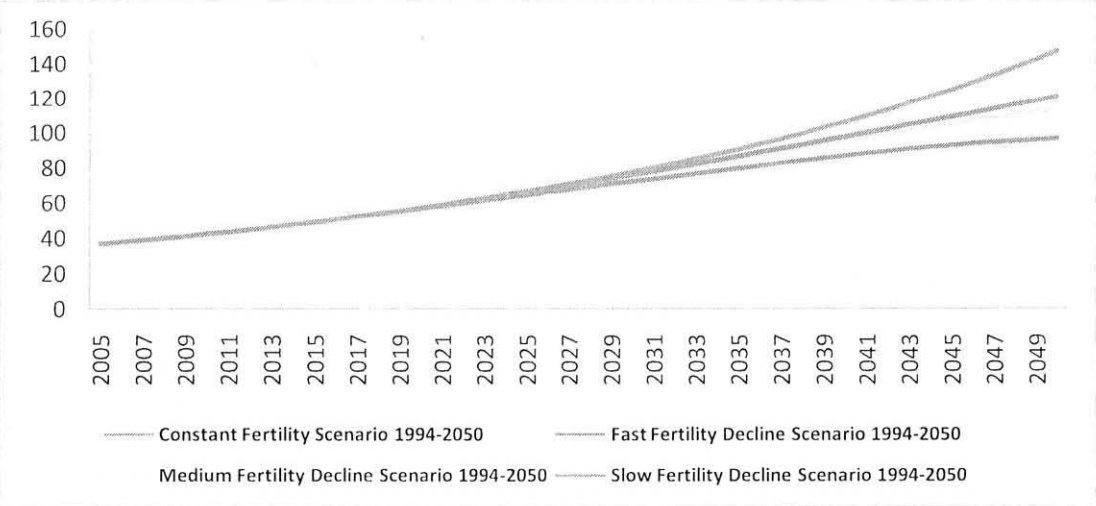
- Increasing the labor force participation rate of Males $_{(15\text{-}64)}$ to 90% by the year 2035 and onwards from its level of 81% in 1999. The parallel assumption for Females $_{(15\text{-}64)}$ is to raise it to 85% from its level of 64% in 1999.

- The Economic growth rate of 10.1% is also assumed to be maintained for the next four decades

One of the causes for unemployment in Ethiopia, as discussed in section 1.4.2 above is the unprecedented (urban) population growth. As shown in figure (11) below between now (2010) and 2050 the total size of the labor force, following changes in size and age structure of the population, increases dramatically. However, due to the inbuilt population momentum in the past, the labor force will keep increasing whichever fertility path the country is to follow. The difference in fertility scenarios starts to be felt in late 20s and by 2040 the labor force will reach 86 million, 95 million and 98 million for the fast, medium and slow fertility declining assumptions respectively.

The difference in labor force between the fast and slow fertility decline by then will reach around 13 million people. The respective labor force for the year 2050 will reach 96 million, 113 million and 121 million showing labor force difference of 25 million between the fast and slow fertility decline assumptions by 2050 (See Annex III, p- 84).

Figure 7: Projection of Labor Force (in million) under Fast, Medium and Slow Fertility Assumptions, 2005-2050.



Source: Author's projection using the Spectrum Model; data from NLFS (1999 &2005)

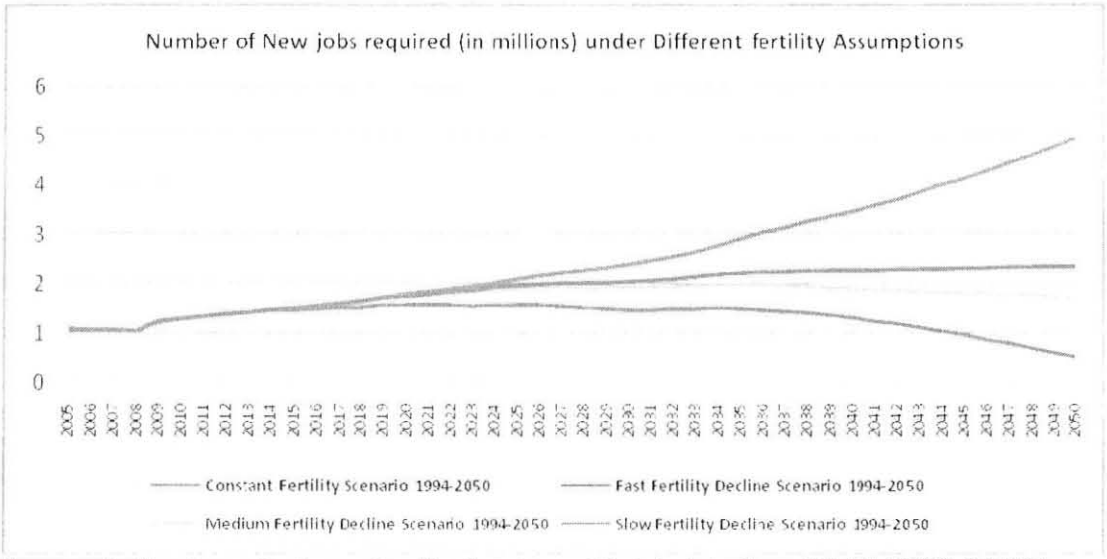
The figures above are projected based on plausible assumptions taken in to consideration. According to the 1999 NLFS labor force participation rate for $Male_{(10-14)}$ was 51%, $Male_{(15-64)}$ was 81%, $Female_{(10-14)}$ was 38% and $Female_{(15-64)}$ was 64%. Given these figures by 2035 labor force participation for economically active males (15-64) and females (15-64) are assumed to increase to 90% and 85% respectively while participation

rate for the school age boys and girls (10-14) are assumed to reduce to 25% and 20% respectively. These later figures are in line with the goal of achieving universal primary education.

The implication is that even with the most optimistic economic growth rate scenario, i.e., 10.1% per year assumed to continue in the next four decades, between now (2010) and 2050 the economy needs to create on the average 1.3 million, 1.7million and 1.9 million new jobs annually between now and 2050 under the fast, medium and slow declining fertility assumptions respectively to absorb the emerging labor force (See Annex IV page-85). This shows that the economy is expected, on average, to create more than half a million additional jobs annually over the projection period if fertility is to follow the slow decline scenario against the fast one. The number of new jobs required in the future is assumed to be equivalent to the difference in the size of the Labor Force from one year to the next.

The finding here is in sharp contrast with previous research (Daniel, 2003; Page-35) where the additional jobs required per annum on average was estimated to be over a million. This is partly attributable to the difference in the fertility assumption taken. Also, in the same paper comparison was made with the constant fertility assumption where fertility was assumed to continue at the then 5.9 rate for the next five decades, which is highly unlikely. Furthermore, the differences in economic growth rate and the labor force participation rates taken might explain the huge difference observed in the number of new jobs required.

Figure 8: Projection of New Jobs required (in million) under Fast, Medium andh Slow Fertility Assumptions, 2005-2050.



Source: Author's projection using the Spectrum Model; data from NLFS (1999 &2005)

In addition to mere increase in labor force participation rates, there are also concerns of increasing demand for jobs driven by positive forces such as education. Given the Governments huge investment in education over the past two decades, the recent expansion of new Universities, the improvement of intake capacity of existing universities and the mushrooming of private colleges of various kind, the demand for job is expected to increase in the future because labor force participation in the economy increases as the educated youth become more active in searching for job. Findings in other countries prove this where a recent analysis in Egypt has shown that the highest rates of unemployment have now shifted to University graduates. There are two reasons for this shift: University students were the fastest-growing group among new entrants and the group most dependent on government employment, which is not growing as fast or might even be shrinking (Assaad and Roudi-Fahimi, 2007).

The Ethiopian labor market is changing in terms of quality and quantity of labor supply due partly to the increasing skill level and improvement in individual mobility. A study by the World Bank (2007) on urban labor market in Ethiopia showed that every year approximately 600,000 people, mainly youth, are entering the labor market. The same study also reveal that roughly 550,000 are already sitting unemployed in Ethiopian cities and towns (WB, 2007; Page 70), of whom about half been jobless for more than 12

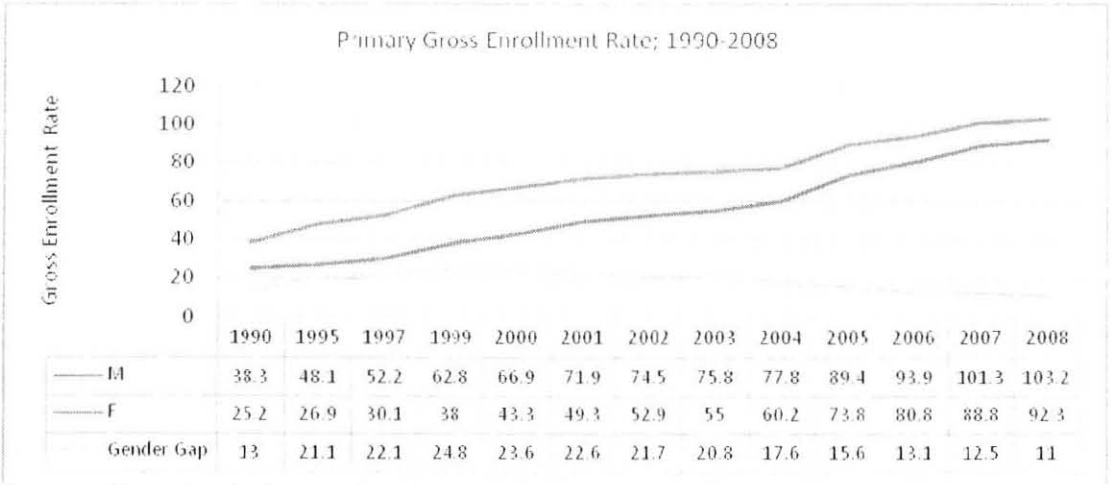
months. On the other hand, Data from MoFED (2006) report show in 2004/05 alone the small-scale manufacturing enterprises has created fixed and temporary jobs for 107,283 people. Despite data disagreements between the World Bank and MoFED, the jobs created in either case are very distant from the number of jobs needed to absorb the labor force.

Under this condition it is very clear that there is huge gap between demand and supply of labor as well as between entrants to the labor market and those who exit (as retirees or leaving the market due to competition) from it. In the long run, as indicated above, the problem will get more pressing if population is to follow the slow fertility scenario, restraining the prospect of the youth to obtain employment opportunities and the country's opportunity of capturing the dividend. Thus in addition to other causes of unemployment, the population structure (geographical distribution and age profile) and growth (size) in the country has played its role in the past and will continue to do so for some time in the future. Therefore, in the long run, controlling population will at least ease the demand for new jobs required to absorb the labor force, as shown in figure (8) above. It also creates enabling environment to invest in the youth by shifting resources away from child dependents because of the changing age structure.

4.1.4. Educational Achievement s and Gaps

The dual nature of women's predicament in Ethiopia is reflected in the gender gaps that prevail in educational attainment, especially at secondary level. As indicated in figures (9a and 9b) below female students' significant increase in primary education is almost equal to that of males. More interestingly, the gender gap gets narrower with time and in 2008 gender gap for net enrollment was 5.6 per cent only from its level of 16.6 in 1997.

Figure 9a: Trends in Gross Primary School Enrollment Rate in Ethiopia by sex, 1990-2008

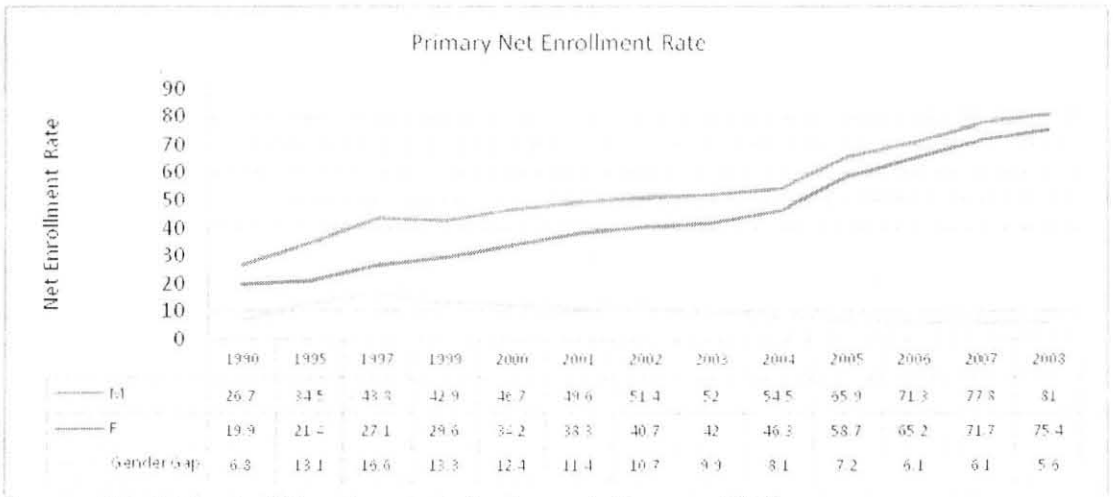


	1990	1995	1997	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
M	38.3	48.1	52.2	62.8	66.9	71.9	74.5	75.8	77.8	89.4	93.9	101.3	103.2
F	25.2	26.9	30.1	38	43.3	49.3	52.9	55	60.2	73.8	80.8	88.8	92.3
Gender Gap	13	21.1	22.1	24.8	23.6	22.6	21.7	20.8	17.6	15.6	13.1	12.5	11

Source: World Bank, Education statistics Annual Abstract, 2009

One can acclaim the efforts of government including the establishment of women affairs office at national and regional level, which focused on abolishing harmful traditional practices and promotion of girl's education, for the observed sensible improvement of gender gap in primary education. In addition , Ministry of Education also set a target to "address equity issues by narrowing the gap between male and female, among regions and rural and urban areas" in its ESDP III objectives (2005) which would likely gear schools and other development partners to work towards it. The increasing number of female teachers, as female role models (Lexow, 2003, cited in Lasonen et al, 2005) also might have attracted girls to primary schools and contributed for the improvement of gender gap in primary education.

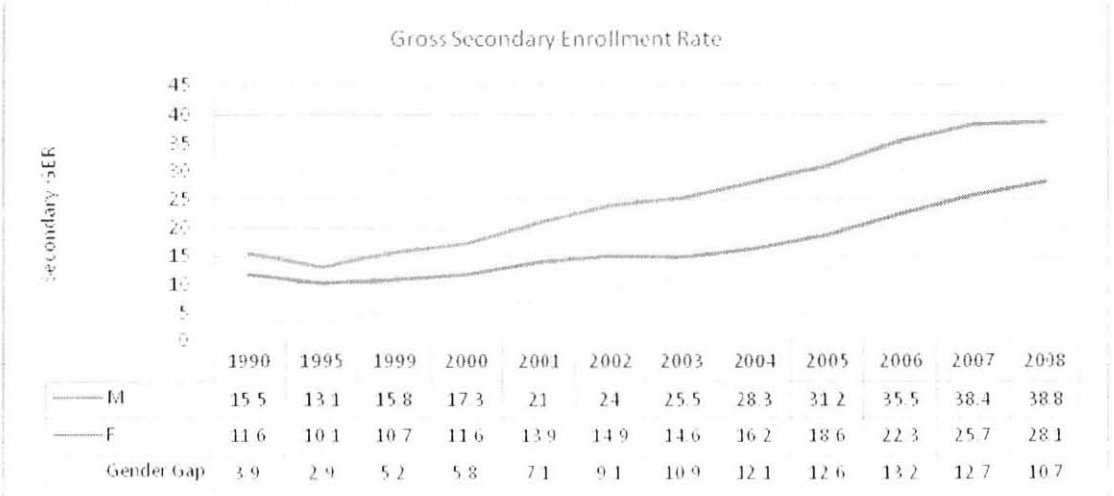
Figure 9b: Trends in Net Primary School Enrollment Rate in Ethiopia by sex, 1990-2008



Source: World Bank, Education statistics Annual Abstract, 2009

From the vantage point of development, the increase in enrollment rate in primary education means that in the future, illiterate unemployment is likely to be less prevalent (Berhanu et. al, 2005) in the country. Absorbing those students who manage to graduate from primary level into secondary education therefore has dual advantages. On the one hand it would ease/postpone youth unemployment problem the economy is to face by keeping students in schools. On the other hand, it boosts youths' future prospect through building their human capital and skill.

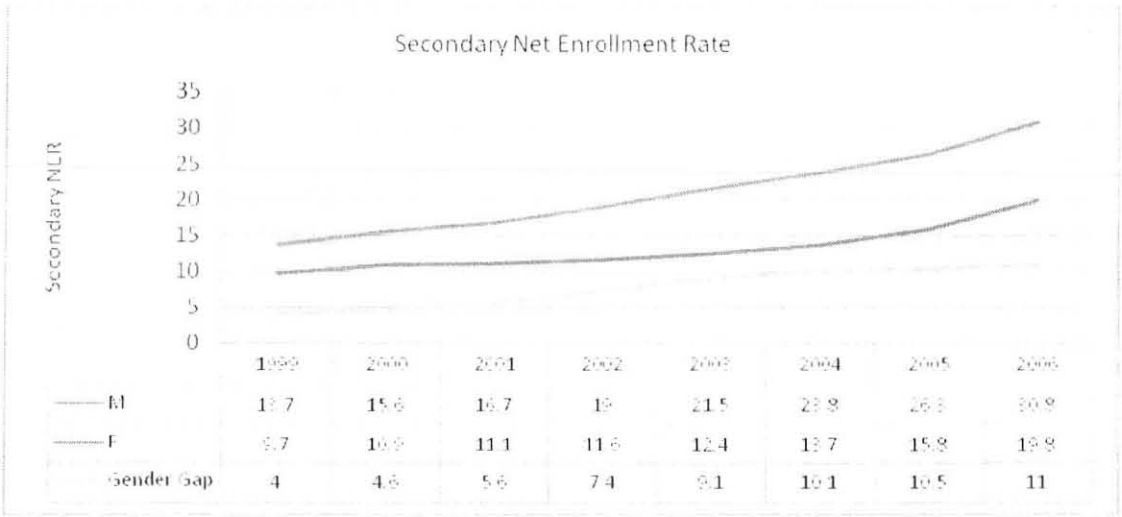
Figure 10a: Trends in Gross Secondary School Enrollment Rate, 1990-2008 by Sex.



Source: World Bank, Education Statistics, 2009

Ethiopia's track record in terms of secondary education had been very poor in the past. In recent years however the country is showing slight progress in secondary education enrollment rate as well. Nevertheless, female's record is lagging behind and ironically, unlike the case in primary education, the gender gap in secondary education increased over time, growing from 4 percent in 1999 to 11 percent in 2006 as shown in figure (10b) below. As with unemployment rate, there exists a wider gender disparity in education, particularly in secondary school.

Figure 10b: Trends in Net Secondary School Enrollment Rate, 1999-2008 by Sex.



Source: World Bank, Education Statistics, 2009

A recent study by Randell and Gergel (2009) identified four main categories of factors causing gender gaps in Education in African countries: *macro-level* (poverty, inadequate educational resources, HIV and AIDS, continued economic dependence on former colonial powers, urban versus rural resource disparities); *legal and policy related* (lack of government funding for schools and teachers, lack of free and compulsory primary education, lack of financial incentives for girls' education, gap between policy and practice in girls' education rhetoric); *school-related* (curricula that reinforce traditional gender stereotypes, inadequate sanitation facilities and lack of provision for sanitary materials for teenage girls, cost of primary and secondary education, sexual harassment by male teachers and classmates, lack of female teachers as role models) and *socio-cultural.*

On the socio-cultural side, factors contributing to the gender gap include: gender socialization, sexual and gender based violence, child labor and domestic labor, early marriages and education for boys more highly valued than for girls. Particularly, gender disparities intensify in secondary education, as cultural attitudes reinforce the norm that girls do not need further education after primary school and if financial expenses of education force parents to choose whether to send their son or daughter to school, they will choose the son because sons are seen as a higher economic investment for the future of the family. In relation to this, a study by Ophtat (2009) suggests that the persisting gender gap in educational attainment in Ethiopia is not only an outcome of biased resource allocation in favor of boys within household, but is also a product of different expectations by gender that the socio-cultural norms imposed on the youth.

Even when girls are provided with the opportunity to pursue secondary education, their preparation level is far below than that of boys, due to unequal treatment during primary school and lack of parental and familial support. Thus the transition between primary to secondary school is an important drop-out point where boys are lauded for passing their examinations successfully and girls are left behind. Recent Data from MoE (2009) show that there is significant gender disparity in primary school completion rate despite getting narrower through time. For example, Primary completion rate for grade 8 was 26.3% and 42.1% respectively for female and male by the year 2005 and increased to 40.5 for females and 48.4% for males in 2009 (See Annex VI, page-87).

Another study in Ethiopia by Pathfinder International (2006) found out that female early marriage is one of the major causes for denial of education. The Ethiopian Demographic and Health Survey also indicate that, girls who marry young tend to drop out of school and are more likely to bear children during adolescence, thus effectively ensuring that they will not return to school or develop other work skills. Married girls receive little or no schooling and 73 percent of married women have received no education, compared to 45 percent of never-married women (EDHS, 2006).

School age for secondary education (15-18 years) of girls overlap with their marriage ages and the fact that the practice of early marriage is pervasive in rural Ethiopia makes

secondary enrollment for girls in Ethiopia a difficult task to achieve. More sadly, the concentration of secondary schools in urban areas, inhibiting rural women from attending schools through renting house and living alone, coupled with other opportunity costs, widens gender disparity in secondary education. This is evident from a report by MoFED on proximity to schools. Accordingly, for almost all households in the country (95%), there is a primary school available within a distance of less than 10 km. Access to secondary schools is very poor compared to primary schools. Secondary schools are available within 5 km radius for only 27% of total households in the country, and more than 50% of the rural households live 15 km or more away from a secondary school (MoFED, 2006).

4.1.5. Population Growth and Educational Services Requirements

Assumptions: The underlying assumptions related to Education are:

- Attaining Universal Primary Education (100%) by the year 2015 and maintain it till 2050, and reaching a secondary enrollment rate of 60% by 2035 and increasing it to 80% by 2050.

- Increasing recurrent expenditure per primary school student to ETB 400 in 2035 from its level of ETB 250 in 2007, and to increase recurrent expenditure per primary school student to ETB 800 from its level of ETB 455 in 2007.

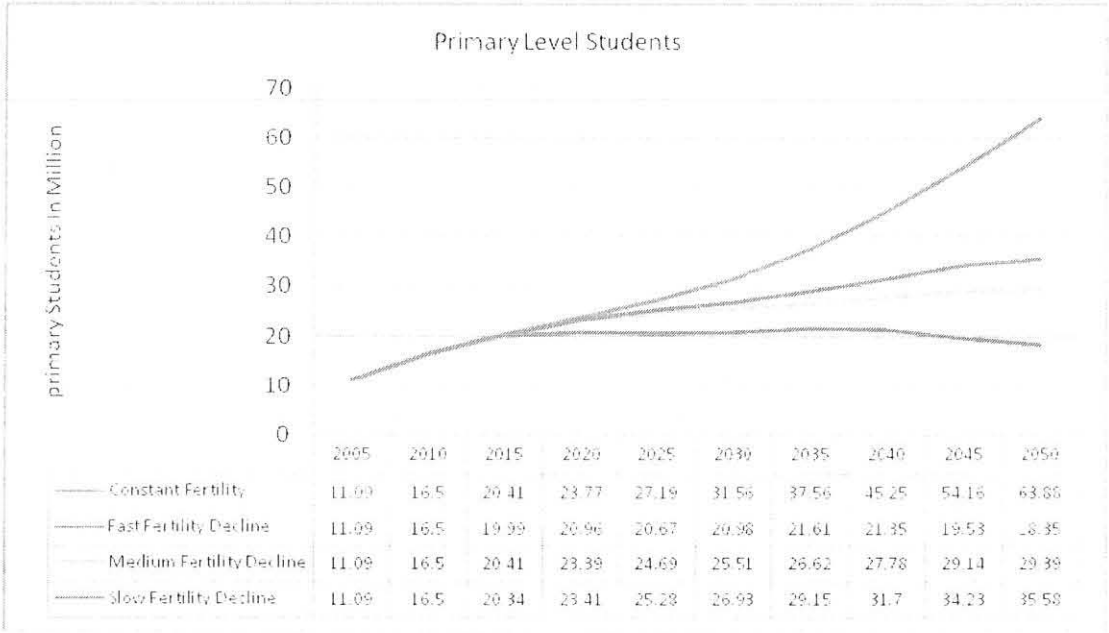
- Reducing student per primary school teacher ratio to 50 in 2035 from its level of 59 in 2007, and reducing student per secondary school teacher ratio to 40 in 2035 from its level of 54 in 2007.

As shown in section 4.1.4 above Ethiopia has made significant progress in education enrollment mainly at primary level. The backlog of students interested in attending school, but previously unable to because of financial need, family issues, or lack of schools is reflected in the disparity between Net and Gross Enrollment Rates in primary and secondary levels. In 2008, for example, GER at primary level was 103 percent while

NER stood at 78 percent. Similarly, in 2006 GER for secondary stood at 29 percent while NER in the same year was 25 percent.

Despite these performances in the past, future achievements in education sector in the next four decades will highly depend on measures to be taken in the population front as well. This is evident in differences between the number of students, teachers, schools and school expenditures required at primary and secondary levels under different fertility assumptions.

Figure 11: Projection of Primary School Level Students (in million) under Four Different Fertility Assumptions, 2005-2050.



	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Constant Fertility	11.09	16.5	20.41	23.77	27.19	31.56	37.56	45.25	54.16	63.68
Fast Fertility Decline	11.09	16.5	19.99	20.96	20.67	20.98	21.61	21.35	19.53	16.35
Medium Fertility Decline	11.09	16.5	20.41	23.39	24.69	25.51	26.62	27.78	29.14	29.39
Slow Fertility Decline	11.09	16.5	20.34	23.41	25.28	26.93	29.15	31.7	34.23	35.58

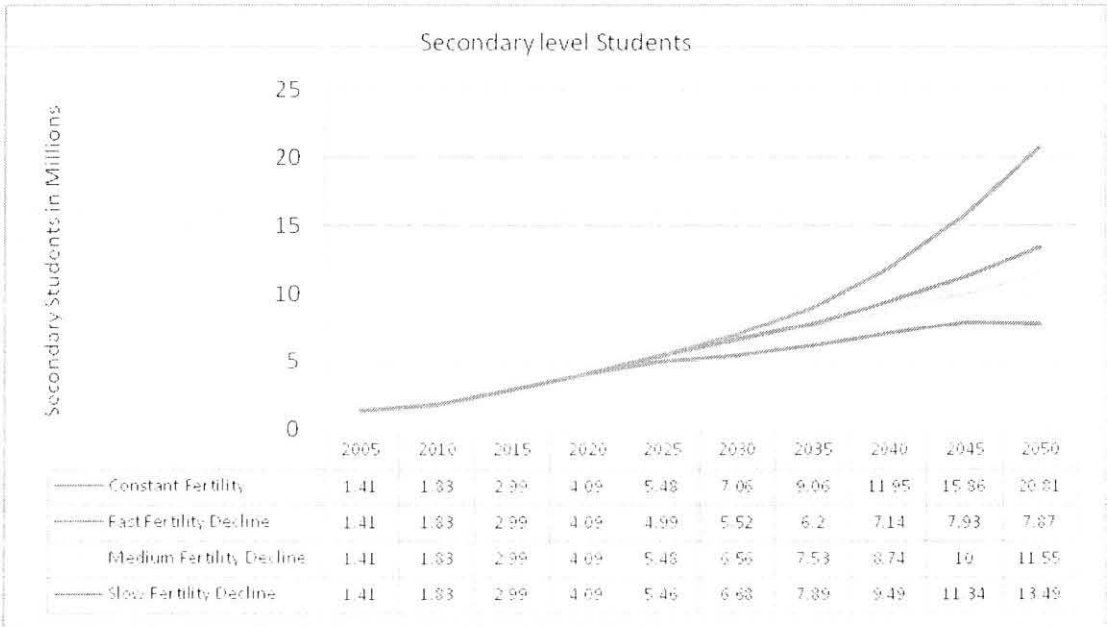
Source: Author's projection using the Spectrum Model

Ignoring the unrealistic assumption of constant fertility (i.e., a TFR of 5.38 in 2010 to remain unchanged till 2050), the country will have 6 million, 10 million and 17 million additional primary level students in 2030, 2040 and 2050 respectively if the slow fertility scenario is taken. As shown in figure (11) above the projected figure for fast fertility decline seem to be almost constant over the period 2015 to 2040. This is attributed to the population inertia of past generation, that is, even if fertility is to decline rapidly the gain in fertility reduction is compensated for by the broad base of persons entering the reproductive age and/or primary school age population. From early 2040 onwards the

primary school age students show dawn ward trend. This is due to the change in the age structure and subsequent smaller cohorts born during fertility decline.

The same holds true for secondary level students where the respective additional secondary level students for the stated years are 1.2 million, 2.3 million, and 5.6 million. The effect of fertility is felt earlier at primary level students than in secondary ones as shown in the two figures (11 and 12). Again this boils down to the change in age structure that follows the rapid fertility decline, and concomitant reductions in the number of children joining primary school age population.

Figure 12: Projection of Secondary Level Students (in million) under Four Different Fertility Assumptions, 2005-2050.



	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Constant Fertility	1.41	1.83	2.99	4.09	5.48	7.06	9.06	11.95	15.86	20.81
Fast Fertility Decline	1.41	1.83	2.99	4.09	4.99	5.52	6.2	7.14	7.93	7.87
Medium Fertility Decline	1.41	1.83	2.99	4.09	5.46	6.56	7.53	8.74	10	11.55
Slow Fertility Decline	1.41	1.83	2.99	4.09	5.46	6.68	7.89	9.49	11.34	13.49

Source: Author's projection using the Spectrum Model

The big difference between the additional number of primary and secondary level students (6 million Vs 1.2 million by 2030 for example) is partly an outgrowth of the youthful demographic profile of Ethiopia, and partly it is a result of the assumptions taken for primary and secondary enrollment rates. In the paper the assumption is that the country will achieve (or keep it if achieved) Universal Primary Education (100%) from 2015 onwards and it will reach 60 percent secondary enrollment rate by 2035 and increase this rate to 80 percent by 2050.

The implications are that these additional primary and secondary level students need additional schools, teachers and other teaching facilities putting further strain on government finance. This will compromise quality of education and hamper the achievement of tertiary education. Studies in Middle East and Northern African countries (Assaad and Roudi-Fahimi, 2007) show that due to continued fertility decline and the slower rate of growth of the school-age population, governments face less pressure to increase the number of seats in primary schools, and, with some time lag, secondary schools, and therefore have an opportunity to focus on improving the quality of schooling as well as expanding higher education.

In the Ethiopian case, until early 2040s no major decline is to be seen in the absolute number of primary school students (and no decline at all in secondary) whichever fertility path is taken (See Figures 11 and 12 above), but there are enormous gains to be secured from controlling population including improvements in quality of education and expansion of higher education. The tables below estimate the number of teachers, number of schools and financial expenditures required both at primary and secondary level to absorb the youth.

Table 1: Projection of Primary and Secondary Schools required (in thousands) under Fast, Medium and Slow fertility Assumptions, 2010-2050.

Primary Schools Required in Thousands				Secondary Schools Required in Thousands			
Year	Fast Fertility	Medium Fertility	Slow Fertility	*Year*	Fast Fertility	Medium Fertility	Slow Fertility
2010	25.0	25.0	25.0	*2010*	1.3	1.3	1.3
2015	31.9	32.6	32.4	*2015*	2.3	2.3	2.3
2020	35.2	39.3	39.3	*2020*	3.4	3.4	3.4
2025	36.7	43.8	44.9	*2025*	4.4	4.8	4.8
2030	39.4	48.0	50.6	*2030*	5.1	6.1	6.2
2035	43.2	53.2	58.3	*2035*	6.2	7.5	7.9
2040	42.7	55.6	63.4	*2040*	7.1	8.7	9.5
2045	39.1	58.3	68.5	*2045*	7.9	10.0	11.3
2050	36.7	58.8	71.2	*2050*	7.9	11.6	13.5

Source: Author's projection using the Spectrum Model

As can be seen from table (1) above the country needs to build around 15 thousand more primary schools and around 1,700 more secondary schools by 2035 to achieve Universal Primary Education and increase enrollment rate at secondary level to 60 percent if

fertility is to decline at slow rate against the fast fertility decline scenario. A word for caveat here is that these numbers are differences in schools needed between the fast and slow fertility decline assumptions rather than actual schools needed (58,000 Vs 43,000 primary schools, for example, by the year 2035).

Table 2: Projection of Primary and Secondary Teachers required under Fast, Medium and Slow Fertility Assumptions, 2010-2050.

Primary School Teachers Required in Millions				Secondary School Teachers Required in Thousands			
Year	Fast Fertility	Medium Fertility	Slow Fertility	*Year*	Fast Fertility	Medium Fertility	Slow Fertility
2010	0.28	0.28	0.28	***2010***	35.1	35.1	35.1
2015	0.35	0.36	0.36	***2015***	60.1	60.1	60.1
2020	0.38	0.43	0.43	***2020***	86.8	86.8	86.8
2025	0.39	0.46	0.48	***2025***	111.5	122.4	121.9
2030	0.41	0.49	0.52	***2030***	130.1	154.8	157.6
2035	0.43	0.53	0.58	***2035***	154.9	188.1	197.2
2040	0.43	0.56	0.63	***2040***	178.4	218.6	237.2
2045	0.39	0.58	0.68	***2045***	198.3	250.0	283.6
2050	0.37	0.59	0.71	***2050***	196.8	288.7	337.2

Source: Author's projection using the Spectrum Model

The schools so built, in addition to other teaching materials, need around 110,000 more primary school teachers and around 27,500 additional secondary school teachers by the year 2035 alone. These additional investments in human resource are required to achieve other school quality indicators as well as possible changes in the teaching system. In view of that, average student per primary teacher is assumed to reduce from its level of 59 in 2007 to 50 by 2035 set as National Standard in PASDEP, and reducing students per primary school to 500 by 2035 from its level of 678 in 2007. The quality indicators set for secondary education are reducing, on average, student per secondary teacher and students per secondary school to 40 and 1,000 respectively in 2035 from their levels of 48 and 1250 in 2007. Comparison for other years under different fertility assumption can be made from the above two tables.

According to MoE report annual recurrent expenditure per primary and secondary school student in 2007 was ETB 205 and ETB 455 respectively. Given the current figures, for this paper these expenditures are assumed to rise to ETB 400 for primary student and

ETB 800 for secondary student from 2035 through 2050 providing some room for inflationary pressure. Under such circumstances, 3 billion more ETB, for the year 2035 alone, is required for primary expenditure if population is to grow rapidly against the fast fertility decline assumption.

The same holds true for secondary education and the additional expenditure required in the same year amounts to 1.3 billion ETB. Time and again, it should be brought into attention that the assumption here for secondary education is to reach enrollment rate of 60 percent by the year 2035. If it were to reaching 100 percent level by 2035, which is highly unlikely, the difference in recurrent expenditures between the fast and slow fertility assumptions would have been much bigger than the 1.3 billion ETB.

Table 3: Projection of Primary and Secondary School Recurrent Expenditures required (in Billions ETB) under Three Fertility Decline Assumptions, 2010-2050.

Primary School Recurrent Expenditures Required (Billions of ETB)				Secondary School Recurrent Expenditures Required (Billions of ETB)			
Year	Fast Fertility	Medium Fertility	Slow Fertility	*Year*	Fast Fertility	Medium Fertility	Slow Fertility
2010	4.4	4.4	4.4	*2010*	0.9	0.9	0.9
2015	5.9	6.0	6.0	*2015*	1.7	1.7	1.7
2020	6.7	7.5	7.5	*2020*	2.5	2.5	2.5
2025	7.2	8.6	8.8	*2025*	3.4	3.7	3.7
2030	7.8	9.5	10.1	*2030*	4.1	4.9	4.9
2035	8.6	10.7	11.7	*2035*	5.0	6.0	6.3
2040	8.5	11.1	12.7	*2040*	5.7	7.0	7.6
2045	7.8	11.7	13.7	*2045*	6.3	8.0	9.1
2050	7.3	11.8	14.2	*2050*	6.3	9.2	10.8

Source: Author's projection using the Spectrum Model; data from MoE

4.1.6. Population Growth and Health Services Demand

Assumptions: The underlying assumptions concerning health service are:

- Reducing the Population per Doctor Ratio to 20,000 by 2035 from its level of 35,493 in 2006, and reaching a Population per Nurse Ratio of 5,000 in the same year from its level of 4,207 in 2006

- Reducing the Population per Health Center Ratio to 25,000 from its level of 118,216 in 2006, and reducing the Population per Hospital Ratio to 250,000 from its level of 543,964 in 2006

- Increasing the annual health expenditure per person to ETB 100 from its level of ETB 13.3 in 2006.

Health is one of the social services that governments, in developing and developed countries alike, have hard time meeting. Among other things health system is measured by the level of access to and quality of service provided, gauged in terms of availability of human and physical resources. Concerning human resource requirement, the paper used population per doctor and population per nurse as health service indicators. It also normalized these indicators to meet the standards set by the World Health Organization. Accordingly, from 2035 onwards population per doctor and population per nurse ratio are set to reach 20,000 and 5,000 respectively.

Interestingly, Ethiopia has already qualified in meeting the WHO standard of population per nurse ratio though it is distant from the population per doctor standard. For example, population per doctor and Population per nurse ratio in the year 2006 was 35,495 and 4,207 respectively. The increasing population size in the face of difficulties meeting the current health service demand makes things more difficult in the future unless measures are taken in advance to bring fertility down.

For instance, to meet the WHO health standards, in 2035 alone the country needs to train 1,200 more doctors and 5,100 more nurses if population growth follows the slow fertility decline scenario as opposed to the fast one, which needs lower investment in human resources. This is clearly indicated in table (4) below.

Table 4: Projection of Doctors and Nurses required (in Thousands) under Different Fertility Assumptions, 2010-2050

	Doctors Required in Thousands			Nurses Required in Thousands		
Year	Fast Fertility	Medium Fertility	Slow Fertility	Fast Fertility	Medium Fertility	Slow Fertility
2010	2.27	2.30	2.31	17.57	17.79	17.81
2015	2.81	2.92	2.92	19.52	20.26	20.29
2020	3.46	3.67	3.70	21.39	22.70	22.88
2025	4.27	4.62	4.71	23.26	25.16	25.61
2030	5.32	5.86	6.05	25.07	27.64	28.54
2035	6.64	7.55	7.92	26.55	30.18	31.67
2040	7.00	8.25	8.80	28.01	33.01	35.22
2045	7.32	8.91	9.68	29.29	35.64	38.73
2050	7.58	9.48	10.51	30.31	37.92	42.05

Source: Author's projection using the Spectrum Model; data from MoH

The same holds true for health related physical infrastructures such as Hospitals and Health Centers. Data from the MoH for the year 2006 show that the number of people per health center was 118,216 and that of population per hospital was 543,964. With the goal of reducing these ratios to 25,000 health centers and 250,000 district hospitals respectively by 2035, quite a sizable amount of physical resource is required if population growth follows the slower fertility decline assumption, time and again, requiring higher investments in physical capital. By 2035 alone, for instance, around 100 more Hospitals and 1,000 more Health Centers are required. As is the case with education, the figures here are differences rather than actual health infrastructures required. Table (5) below illustrates the differences in health related physical resources under different fertility scenario for different years.

Table 5: Projection of Health Centers and Hospitals required under Fast, Medium and Slow Fertility Decline Assumptions, 2005-2050.

	Health Centers Required Thousands			Hospitals (District) Required		
Year	Fast Fertility	Medium Fertility	Slow Fertility	Fast Fertility	Medium Fertility	Slow Fertility
2005	0.6	0.6	0.6	130	130	130
2010	0.82	0.83	0.83	163	165	165
2015	1.08	1.12	1.12	204	212	212
2020	1.46	1.54	1.56	255	271	273
2025	2.04	2.21	2.25	322	348	354
2030	3.07	3.39	3.49	411	453	467
2035	5.31	6.04	6.33	531	604	633
2040	5.6	6.6	7.04	560	660	704
2045	5.86	7.13	7.75	586	713	775
2050	6.06	7.58	8.41	606	758	841

Source: Author's projection using the Spectrum Model; data from MoH

According to a report by MoH annual recurrent health expenditure per person has increased from ETB 9.1 in 2000 to ETB 13.3 in 2006. Increasing the annual per capital recurrent health expenditure from its level of ETB 13.3 in 2006 to ETB 100 by the year 2035 and onwards, projection reveal that there would be huge strain in government's expenditure unless serious action is taken to limit population growth. By the year 2035 alone the economy needs to spend around 2.5 Billion more ETB to take care of health services. The figure for 2050 is projected to reach 5.8 Billion ETB. This additional money would otherwise be invested in other development areas such as improving the quality of health services. Again these are differences between fast and slow fertility decline assumptions; the actual projected expenditures required are indicated in table (6) below.

Table 6: Projection of Annual Recurrent Health Expenditure required (in ETB) under Fast, Medium and Slow Fertility Decline Assumptions, 2010-2050.

Annual Recurrent Health Expenditures in ETB			
Year	Fast Fertility	Medium Fertility	Slow Fertility
2010	2,342,938,624.00	2,374,879,744.00	2,372,533,504.00
2015	3,970,200,576.00	4,120,041,984.00	4,126,749,696.00
2020	5,890,216,960.00	6,248,738,304.00	6,298,608,640.00
2025	8,112,954,880.00	8,774,545,408.00	8,932,751,360.00
2030	10,619,193,344.00	11,710,080,000.00	12,089,543,680.00
2035	13,272,699,904.00	15,091,200,000.00	15,832,999,936.00
2040	14,003,299,328.00	16,503,500,800.00	17,607,999,488.00
2045	14,645,699,584.00	17,820,000,256.00	19,362,701,312.00
2050	15,157,399,552.00	18,961,399,808.00	21,026,099,200.00

Source: Author's projection using the Spectrum Model; data from MoH

4.1.7. Population Growth and Landlessness

Assumption: the underlying assumption concerning population growth and landlessness is that the urbanization level in Ethiopia will reach 30, 35, 40, and 45 percent in the years 2035, 2040, 2045 and 2050 respectively. This assumption partly is based on the level of urbanization projected by CSA (1999) and partly assuming that the country affords to reach the level of urbanization (that 45%) by the 2045 that West African countries achieved in late the 1990s.

Readings concerning performance of the agriculture sector in Ethiopia are mixed and at times conflicting. According to a recent annual report by the EEA, for example, the performance of the agricultural sector in terms of production is good where "the 2008/09 production exceeds the preceding year's performance by 5.7% and represents the fifth consecutive bumper harvest" (EEA, 2009, p-60). The same report declares that over the past five years, production has increased on average by 14 % every year, and attributed the improvement to area expansion and improved land productivity.

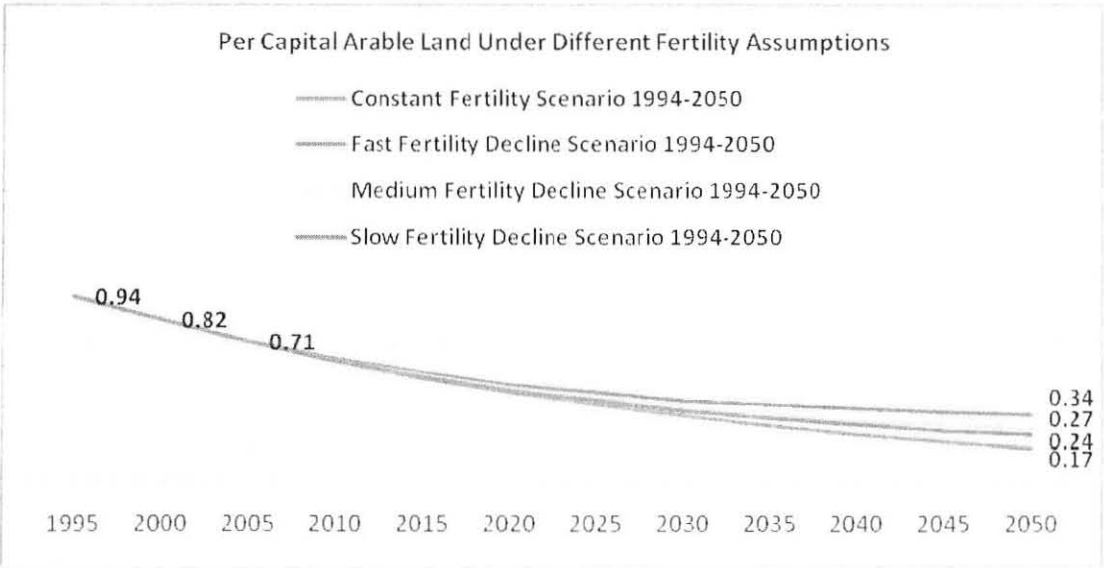
On the other hand the use of modern farm technology in Ethiopia is low by world standards. FAO/WFP report (quoted in EEA ,2009) show that in the 2008 *meher* season, at least 95% of all seeds used were local seeds carried over from the previous harvest

rather than improved/certified ones. Similarly CSA (2009) quoted in the same EEA report show that of the 12.47 million hectares of land cultivated by various crops, only 0.47 million hectares (3.7%) were planted by improved seeds. Furthermore, of the 11.4 million hectares of land cultivated by various crops in 2008/09 only 164,370 hectares of land (1.4%) were irrigated, excluding land irrigated by large estates.

These show that the adoption of modern farm input and agricultural intensification in the country are at rudimentary level. Coupled with these poor farming practices the dwindling per capita land availability, which mainly is rooted in the population size and structure, is a cause for concern. This is evident in figure (13) below where per capita arable land will keep diminishing from its level of 0.94 hectare per person in 1995 to 0.17, 0.24, and 0.27 hectare per person by the year 2050 under the fast, medium and slow fertility decline assumptions respectively. This too is taking total arable land of the country to be 51.3 million hectares while the current land under cultivation is not more than 13 million hectares.

Data on per capita arable land holdings (EEA Data Base, 2009; World Bank Report) also witness the same, where arable land per person declined from 0.47 hectare in 1965 to 0.16 hectare in 2003 due to population growth that mainly is related to high fertility, mainly in rural Ethiopia. The difference in per capita arable land here might lie in the data taken as arable land where arable land is confused with cultivated land.

Figure 13: Projection of Per Capital Arable Land (in Hectare) under Fast, Medium and Slow Fertility decline Assumptions, 1995-2050.



Source: Author's projection using the Spectrum Model

This projection takes into account the fact that through time a shift of labor from agriculture to other sectors will take place. Accordingly, in 2035 urbanization level is assumed to reach 30 percent level, leaving 70 percent of the population to stay in rural parts of the country. Similarly, the Percent Urban population by the year 2050 is assumed to reach 45 percent once again leaving 55 percent of Ethiopian population for the rural economy. This would release some land with a tendency of increasing holdings, but the gain in urbanization will be compensated for by the increase in the rural population in absolute terms. The flip side of the problem rather is that with the increase in urbanization level, urban problems are bound to emerge including demand for housing, employment and other social services. This is evident in the actual projected size of urban households and urban adolescents/youth. This is also evident in the differences in urban households and urban adolescents/youth between the fast and slow fertility decline assumption as indicated in tables (7a and 7b) below.

Table 7a: Projection of Urban Households under Fast, Medium and Slow Fertility Decline Assumptions, 2010-2050.

Urban Households				
Year	Constant Fertility Scenario 2010-2050	Fast Fertility Decline Scenario 2010-2050	Medium Fertility Decline Scenario 2010-2050	Slow Fertility Decline Scenario 2010-2050
2010	3,326,460	3,281,723	3,326,460	3,323,175
2015	4,231,771	4,035,768	4,188,083	4,194,901
2020	5,376,048	4,887,737	5,185,219	5,226,631
2025	6,858,469	5,873,060	6,351,990	6,466,520
2030	8,530,698	6,772,827	7,468,517	7,710,583
2035	13,833,322	9,954,592	11,318,426	11,874,750
2040	19,074,324	12,252,867	14,440,560	15,406,986
2045	25,773,888	14,645,700	17,820,024	19,362,740
2050	34,305,208	17,052,092	21,331,564	23,654,308

Source: Author's projection using the Spectrum Model

Table 7b: Projection of Urban Youth aged 12-15 under Fast, Medium and Slow Fertility Decline Assumptions, 2010-2050.

Urban Youth (Aged 12-25)				
Year	Constant Fertility Scenario 2010-2050	Fast Fertility Decline Scenario 2010-2050	Medium Fertility Decline Scenario 2010-2050	Slow Fertility Decline Scenario 2010-2050
2010	4,449,192	4,433,401	4,449,192	4,448,044
2015	5,367,931	5,305,549	5,353,598	5,356,119
2020	7,074,813	6,848,936	7,013,132	7,013,127
2025	8,860,338	7,999,896	8,636,861	8,672,268
2030	10,665,206	8,504,127	9,834,127	10,010,913
2035	16,423,822	11,333,957	13,732,170	14,358,464
2040	22,371,300	13,361,242	16,503,679	17,841,630
2045	30,333,468	15,269,580	19,502,186	21,896,896
2050	40,555,152	16,305,166	22,731,346	26,400,492

Source: Author's projection using the Spectrum Model

4.1.8. Population Growth and Agricultural Production and Consumption Gaps

In addition to the effect population growth has on landlessness, there is also wide gap to be observed between production and consumption of major agricultural crops in the coming decades. Available data on production and consumption of major crops (Teff, Maize, Wheat, Barely and Sorghum) show that from 1990 to 2004 the country has produced 93,888,438 Metric tons of cereals while it imported 9,946,572 Metric tones of cereals, mainly Maize and Wheat, in the same period to fill the gap between production and consumption. In other words, the annual average production of these major crops between 1990 and 2004 was 6.7 million Metric ton (regardless of recent increase in productivity) while the annual average net import was 711 thousand Metric tons that is used to fill the gap between production and consumption (FAO, CSA, EEA/EEPRI Data Base, 2009) in the same period.

Even with increasing imports the annual per capita consumption of these major crops on average between 1994 and 2004 was 130 Kg. However, to meet the recommended minimum dietary standards of 2200 Kcal, the annual food requirement is estimated to be 225 Kg/adult/annum (FAO, 1992; MEDAC, 1999) where 70 percent is to be obtained from cereals. Hence the per capital consumptions of major agricultural crops is assumed to increase to 158 Kg (70% of the 225 Kg) by the year 2035 and onwards to meet the threshold.

The annual consumption needs with increasing population size therefore are projected in table (8) below under the fast, medium and slow fertility decline scenarios. However, projecting Ethiopian agricultural production is a difficult task due to the low level utilization of technology and the heavy dependence of agricultural productivity on rain fall. Under these circumstances, either agricultural productivity has to increase (through the use of modern farm technologies including irrigation and agricultural intensification) or the government has to import the deficit amount.

Data from CSA show that production of major crops for the year 2004 was 9,597,210 Mt while major crops for consumption purpose were 11,163,591 Mt, and the difference is accounted for by imports from abroad in the form of aid or purchase. As shown in table

(8) below, if population is left uncontrolled, consumption needs for these major agricultural crops increases significantly, and to keep pace with these needs either production or import or both have to increase to avoid food shortage in the country. Population control, however, would play its role in easing out the problem through reducing demand for consumption as shown in table (8) below between the fast and slow fertility decline assumption. But it is not a panacea for the complex problems that surround the agriculture sector in Ethiopia.

Table 8: Projection of Demand for Consumption of Major Crops under Fast, Medium and Slow Fertility Decline Assumptions, 2010-2050.

	Consumption Needs of Major Crop (in MT)		
Year	**Fast Fertility Decline Scenario 2010-2050**	**Medium Fertility Decline Scenario 2010-2050**	**Slow Fertility Decline Scenario 2010-2050**
2010	12,978,310	13,155,242	13,142,246
2015	14,618,964	15,170,707	15,195,405
2020	16,238,862	17,227,278	17,364,766
2025	17,896,594	19,356,016	19,705,008
2030	19,542,670	21,550,246	22,248,580
2035	20,970,866	23,844,096	25,016,140
2040	22,125,212	26,075,532	27,820,640
2045	23,140,204	28,155,600	30,593,068
2050	23,948,692	29,959,012	33,221,236

Source: Author's Projection using the Spectrum Model

In a related study the World Bank (2007) report states that in 2003 about 13 to 14 million people were threatened with starvation and it is estimated that 5 to 7 people annually are in need of food aid to survive. Clearly, Malthusian positive checks, such as epidemics and famine, to restore mortality rate 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 fertility reduction, 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.

While there still are advantages to be derived from controlling population in the coming decades concerning agriculture/land and productivity, solutions are required to be sought in other areas as well. Ethiopian population is increasing by 2 million people each year, despite declining trends in fertility over the past decade. It is very difficult to make progress in reducing poverty at this rate. Especially Ethiopia's rain-fed agriculture which is supporting the livelihood of over 80 percent of the population could not continue in absorbing the growing population without compromising its productivity and sustainability (EEA, 2009).

Under such circumstances one of "the options the rural economy has, is diversifying its livelihood strategies into non-farm activities as the contribution of non-farm activities to employment creation is at rudimentary level, that is, non agricultural activities accounted for only 9 percent of the rural employment" (CSA, 2007; EEA, 2009). Thus creating rural farm and non-farm activities linkages is one means in the battle against rural poverty. Other studies in the area also recommend creating and strengthening the rural-urban linkages (Shumiye, 2003; Gete et al., 2008), and yet others go for tenure security (Dessalegn, 2009). However, the issue of land and agricultural productivity in Ethiopia are multifaceted that include structural transformation and political commitment which go beyond the scope of this paper.

4.1.9. Population Growth and Per Capita GDP

Data from MoFED indicate that Gross Domestic Product at Constant Price by the year 1994 was 46,549 million ETB and increased to 85,184 million ETB in 2006. If the current annual economic growth rate of 10.1% is assumed to continue in the next four decades, the economy will grow significantly in the stated years reaching as high as half trillion ETB and 1.5 trillion ETB by the year 2025 and 2035 respectively. That will have its own repercussion on per capita GDP of citizens.

The most conventional indicator of social mobility is Human Development Index that combines three dimensions: life expectancy at birth (as an index of population health and longevity); Knowledge and education (as measured by the adult literacy rate and the

combined primary, secondary, and tertiary enrollment rate); and Standard of Living (measured by the GDP per capital at purchasing power parity).

Even though, per capita income is not a genuine indicator of development, it is one component of it and partly explains the development level of nations. In addition to the impacts population has on provision of social services as discussed in the above sections, rapid population growth also retards per capita GDP of citizens. Table (9) below, for instance, indicate that per capita GDP will reach 10,793 ETB by the year 2035 under the fast fertility decline scenario while it is 9,048 ETB under the slow fertility assumption with a difference of 1,745 ETB.

Table 9: Projection of Per Capita Income (in ETB) under Fast, Medium and Slow Fertility decline Assumptions, 2010-2050

	Per Capita GDP in ETB		
Year	**Fast Fertility Decline Scenario 2010-2050**	**Medium Fertility Decline Scenario 2010-2050**	**Slow Fertility Decline Scenario 2010-2050**
2010	1,550	1,531	1,529
2015	2,233	2,152	2,148
2020	3,262	3,075	3,051
2025	4,803	4,441	4,362
2030	7,137	6,473	6,269
2035	10,793	9,492	9,048
2037	12,793	11,087	10,498
2039	15,183	12,973	12,201
2041	18,046	15,209	14,205
2043	21,479	17,870	16,571
2045	25,601	21,041	19,364
2047	30,568	24,834	22,677
2049	36,566	29,384	26,612
2050	40,021	31,992	28,850

Source: Author's projection using the Spectrum Model

Furthermore the Government of Ethiopia has the objective of reaching middle income countries in the coming 20 to 30 years where the country has a goal to "increase per capita income of citizens so that it reaches at the level of those in middle income countries." The table above also demonstrates that under the fast fertility decline assumption the country has prospect of reaching the category of middle income countries

earlier than the slow fertility assumptions imply. On the other hand the above projection confirms that the government's plan of reaching middle income countries in a short period of time, i.e., within 20 to 30 years starting from year 2005, indeed is very ambitious.

This is based on the World Bank's division of economies in to income groups. As per the 2008 GNI per capita, countries are grouped under low income, $975 or less; lower middle income, $975-$3,855; upper middle income, $3,856-$11,905; and high income, $11,906 or more (World Bank , 2009). These hold true if the following conditions are maintained; (1) the definition of middle income as of 2008 should hold true in 2035 and beyond, (2) the economy should grow by 10 percent or more for the same period and (2) the exchange rate will not show significant variation from its current level.

Related studies in the area also show that if population growth is about 2 percent and above per year, which is very common in many developing countries in the post World War II era, then per-capita income will not rise and may fall unless economy grows at a faster rate (World Bank, 2007). Table (10) below is meant to illustrate that the possibility of increasing per capita income in Ethiopia is likely under the fast fertility decline assumption as annual population growth rate drops below 2%, earlier under the fast fertility scenario as oppose to the slow one.

Table 8: Projection of Annual Population Growth Rate under Fast, Medium and Slow Fertility decline Assumptions, 2010-2050

	Annual Growth Rate (Percent per Year)		
Year	**Fast Fertility Decline Scenario 1994-2050**	**Medium Fertility Decline Scenario 1994-2050**	**Slow Fertility Decline Scenario 1994-2050**
2010	2.54	2.97	2.98
2015	2.13	2.61	2.69
2020	1.96	2.36	2.51
2025	1.81	2.17	2.40
2030	1.59	1.99	2.30
2035	1.16	1.90	2.22
2040	1.00	1.68	2.02
2045	0.83	1.42	1.79
2050	0.59	1.11	1.53

Source: Author's projection using the Spectrum Model

The same position is held by the World Bank (2007) where "Population growth exceeding 2 percent per year is often considered a critical benchmark 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 for public resources especially in the education and health sectors as well as the savings potential of governments and individual households". Ethiopia's population growth is projected under three fertility assumptions and the results are reported in table (8) above. Thus reducing fertility specially in rural Ethiopia play its own role in shaping the country's prospect of joining at least lower-middle-income countries starting from late 2030s and early 2040s; not as shortly as 2025 to 2035 as indicated in PASDEP (2006).

CHAPTER FIVE

5. CONCLUSION AND RECOMMENDATIONS

5.1. Summary and Conclusions

The most important findings of the thesis related to population and development linkages in Ethiopia over the past decades are the huge unemployment rate, especially among the youth, and the low secondary school enrollment rate as well as wide gender disparity in secondary education and formal employment. While the future holds daunting challenges as well as inspiring prospects, it depends greatly on the performance of the economy in the years to come, and measures to be taken by the Ethiopian Government to control population growth and manage its distribution. Under business as usual scenario however, Government and other development partner's efforts to improve social development (or reduce poverty) on the one hand and the gain in economic growth and the prospects of the youth to receive quality education and employment opportunities on the other will be compromised by the increasing population size without notable change in age structure as indicated in the population pyramid.

The imbalance between the supply of and the demand for labor is partly rooted in the population structure in which those who annually join the labor force far exceed those who exit and the job opportunities that exist. Particularly in urban areas, the growth of the economy, in terms of employment creation, has not been able to absorb the labor force, mainly the youth as discussed in chapter 4. Furthermore, in the foreseeable there is a tendency for the labor force to increase and subsequent rise in the demand for jobs. However, there would be considerable gains to be secured from reducing fertility. For example, average annual number of new jobs required under the slow declining fertility is around 1.9 million while it is around 1.3 million if fertility is to decline at higher rate. Therefore, unless in the medium to long run the increase in population is checked, this problem will persist even if the economy continues to perform at the current high rate.

Even under the most optimistic assumptions on the economy (10.1% growth rate) and population (reaching replacement fertility rate by 2035) sides, the average annual number

of new jobs required is huge. This is partly due to the inbuilt population inertia and the backlog of youth and adult population that remained unemployed for along time now. As it is well discussed in chapter four, the problem of unemployment in Ethiopia is multi-pronged and requires multi-sector intervention. Therefore, in addition to measures aimed at population control, solutions are required to found in other areas as well.

In addition to the inadequate growth performance of the economy to absorb the huge labor force, the low internal and external efficiency of the educational system in the country is also responsible for the increasing rate of "educated unemployed" in urban areas in particular and youth unemployment in general. In other words, the educational system has created a mismatch between demand and supply of labor in many ways. For example, it has produced low quality graduates that it has neither equipped them with the entrepreneurial skills required to be self employed nor with high intellectual ability to fit to the existing jobs. On the demand side, too, academically oriented educational system in the past regimes also has created the wrong attitude towards low-class jobs. Furthermore, lack of linkages with employer organizations and the absence of adequate assessment and planning of future demand for labor in the economy as to which stream or discipline is required have produced a mismatch between demand and supply of labor.

However, there are success stories in the education sector including the country's encouraging performance in increasing primary enrollment rate, narrowing gender gap at primary level and improvements in primary completion rate over time. But, its track record for secondary education is not significant. Hence, investment in secondary education to absorb those who graduated form primary level should also receive attention in the government's development plan in order to retain and transform the successes achieved in primary education. This also has an effect of reducing unemployment through keeping the youth in schools.

Gender wise, women bear the disproportionate share of the unemployment and education problems. An important cultural area that impacts both unemployment and population issue, therefore, is the status of women. The government's effort of empowering women and enabling them with equal decision making autonomy to address population issues

and reduce unemployment by increasing production and productivity should be continued on a sustainable basis. Therefore, as has been advances to close the gender gap in primary education, policies are needed that aim at much more comprehensive, societal stance, including cultural change in values and attitudes, to narrow the gender gap in other aspects of socio-economic areas. From the vantage point of value change, productivity and fertility reduction as well, emphasis should be given to secondary education for females. The benefits to be obtained from educating females are double fold as the African proverb goes "If we educate a boy, we educate one person, if we educate a girl; we educate a family – and a whole nation" (Randell and Gergel, 2009).

In addition to its effect on population size, fertility changes the age structure and this will have short term and long term impacts both at macro and micro level. For example, with rapid decline in fertility, household (and family) sizes tend to reduce and in smaller families, girls are more likely to be educated, more likely to choose to work where they command higher wages and strengthen the labor force (Bloom et al, 2001). As a result, the proportion of women in the workforce tends to rise. These will have reciprocal effect where women start families later and have fewer children, as the opportunity cost of being unemployed increases.

When they do have fewer children they are better able to provide for them, offering improved nutrition and health as well as participating more effectively in their education, especially in the formative early years. The result is increased educational quality, which is an even more important determinant of subsequent economic growth than the standard measures of educational coverage and attainment (Hanushek and Kim, 1995). The change in age structure from child dependent to the youth bulge and reduction in population size also reduces the demand for social services (Education, housing and Health for example) allowing a rebalancing of public spending on human and physical capital.

In general rapid population growth in Ethiopia has important implications on provision of social services, improving the status of women and raising the quality of life. Among other things these effects are felt in development areas including employment creation, landlessness, production and consumption gap in agriculture, provision of health and

education services and the prospect of joining the so-called middle income countries. Hence in addition to strengthening the development programs under process, aggressive population programs to reduce fertility mainly in rural areas helps the country a lot in bringing social mobility and/or reducing poverty.

These require the design and implementation of effective policies and programs on the population and development sides. Nonetheless, policies and programs require time to establish and take effect and hence need to be started earlier. Furthermore these policies and programs, in countries at the beginning of the demographic transition, must focus on the needs, aspirations and opportunities for the growing bulge of young people in order to capture the youth potential and transform it into sustainable development. Investments in the above areas to realize the dividend are vital and actions must be taken before existing problems grow in to crisis (youth unemployment, lack of quality education, landlessness, beggary, streetism, vagrancy, juvenile delinquency, prostitution, etc.). Moreover, policies that favor the fertility declines in the past few years need to be sustained and promoted further in order to capture the dividend sooner and in large size.

5.2. Policy Implications

Ethiopia's population and development strategy did not gave enough emphasis to population policy and provision of services to reduce fertility and the focus so far has largely been on fostering shared growth and enhancing gender equity by advancing female education. Even if development has its part to check population, it is a long term process and requires huge investment. Studies in other developing or underdeveloped countries also show that there is no strong correlation between development and fertility reduction. Especially in rural areas where infant and child mortality is high, literacy rate is low and poverty is pervasive, the application of family planning methods and diffusion of information are found to important factors in controlling population rather than development alone. Also, the applicability of the standard economic theories of fertility is under question to bring fertility transition even in the most developed countries of Europe (Bongaarts and Watkins, 1996).

Even when development is a factor to check population growth its importance in countries like Ethiopia (where majority of the population lives in rural areas, literacy is low, child and infant mortality is high and unmet need for family planning is very high) is not strong because the data show that development efforts made so far are not enough to affect fertility significantly, and development programs require time to establish and take effect. Thus development may be the best contraceptive; however, under the current situation of Ethiopia mainly in rural areas, contraceptive and diffusion of information have a strong power to lead to development. This requires the government to allocate more funds for family planning service provision and diffusion of small family norm using information technology in its development strategy.

From the institutional side as well there is a need to evaluate the old population policy of Ethiopia and establish strong institutions, such as the National Office of Population and/or the National Population Council, than can effectively implement the strategies articulated in the National Population Policy of Ethiopia at national and regional level.

One of the culprits for the rather disquieting youth unemployment situation in Ethiopia is the educational system that lacks internal and external efficiency. Hence, the educational system needs to be reorganized in such a way that it creates linkages with the labor market to improve its external efficiency. This requires market survey as to which field of study is required in the market, participation of stakeholders (employers, civic societies, parents, students, etc.) in the design and implementation of education programs, incorporating the labor force requirement and its type in the medium to long term development plan of the country.

The educational system also needs to focus on quality aspect to equip graduates with the necessary expertise and entrepreneurial skill in order for them to establish and run their own business or fit to the existing employment opportunities that are changing with time and becoming more technical. Moreover improving the quality of education increases the completion and progression rate of primary students to secondary level and temporarily eases/postpones the demand for jobs. Also, recent achievements in primary enrollment

need to be transformed in to secondary education, and hence secondary education should receive key attention in the government's development endeavor.

If Ethiopia is to prosper and develop sustainably, the youth must be kept at the center. Thus preemptive actions should be taken tailored towards integrating youth and employment opportunities through: encouraging the role of private sector for employment creation, restructuring the labor market for knowledge transfer and sustainable job engagement, enhancing youths' capacity and creativity, raising the value of work and changing the social stigma attached with "bad" and/or blue collar jobs through providing motivational training, and linking general and technical educations with job opportunities.

Reducing fertility alone would not solve the problem of unemployment and agricultural production and consumption gap, thus in addition to this, the following measure will have some role to play: (1) economic development strategy in the country should be labor-intensive to accommodate the increasing labor force; (2) encouraging the role of private sector participation in employment creation through removing the existing hurdles and creating friendly environment; (3) boosting the role of non-farm activities to absorb the rapidly increasing rural population in the face increasing landlessness as well as fostering its linkage with the agricultural sector to reduce rural underemployment and unemployment; (4) relaxing the objective of reducing rural-urban migration in the population policy and encourage migration of rural population to less crowded cities and towns tailored towards reaping the benefit to be thrown open by rural urban linkages, and (5) agricultural intensification and modernization.

Ethiopia's track records in these indicators in the past are not enough, and if the situation continues like this the future would be bleak. Due to lack of job and other better life opportunities the youth would turn out to be dependents. Beyond current economic problems, youth unemployment also transmit problems to the future as the youth miss work experience, entrepreneurial ability, pecuniary benefits and skills that otherwise would have been accumulated. The youth then grow to be potential burdens instead of real dividends.

5.3. Suggestions for future work

Existing researches on population and development nexus focus more on the supply side demanding the government and other concerned bodies to supply social and economic infrastructures. Nevertheless, to fully reap the dividend researches should also be made on the demand sides which are related to the cultural constraints, expectations, aspiration and capabilities of the youth at community, regional and national level. In particular, researches on barriers for utilization of family planning services mainly in rural Ethiopia, and from youths side as well, studies are required to investigate factors that hinder the youth from exploiting the opportunities provided (education, employment, health services), especially in a globalizing world and changing culture.

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ANNEXES

Annex I: Fertility decline in sample sub-Sahara African countries

Country (year of survey)	TFR			Trend
	National	Rural	Urban	
Eritrea (1995)	6.1	7.0	4.2	
Eritrea (2002)	4.8	5.7	3.5	decline
Ethiopia (1990)+	6.4+			
Ethiopia (2000)	5.5	6.0	3.0	
Ethiopia (2005)	5.4	6.0	2.4	decline
Kenya (1989)	6.7	7.1	4.5	
Kenya (1993)	5.4	5.8	3.4	mid-transition stall
Kenya (1998)	4.7	5.2	3.1	
Kenya (2003)	4.9	5.4	3.3	
Malawi (1992)	6.7	6.9	5.5	
Malawi (2000)	6.3	6.7	4.5	decline
Malawi (2004)	6	6.4	4.2	
Mozambique (1997)	5.2	5.3	4.6	
Mozambique (2003)	5.5	6.1	4.4	early-transition stall
Namibia (1992)	5.4	6.3	4.0	
Namibia (2000)	4.2	5.1	3.1	decline
Namibia (2006/07)	3.6			
Rwanda (1992)	6.2	6.3	4.5	
Rwanda (2000)	5.8	5.9	5.2	
Rwanda (2005)	6.1	6.3	4.9	early-transition stall
Tanzania (1992)	6.2	6.6	5.1	
Tanzania (1996)	5.8	6.3	4.1	
Tanzania (1999)	5.6	6.5	3.2	decline
Tanzania (2004)	5.7	6.5	3.6	
Tanzania (2007/08)*	5.6	6.4	3.4	
Uganda (1988)	7.4	7.6	5.7	
Uganda (1995)	6.9	7.2	5.0	decline
Uganda (2000/01)	6.9	7.4	4	
Uganda (2007)	6.7	7.1	4.4	
Zambia (1992)	6.5	7.1	5.8	
Zambia (1996)	6.1	6.9	5.1	decline
Zambia (2001/02)	5.9	6.9	4.3	
Zambia (2007)	6.2	7.5	4.3	
Zimbabwe (1988/89)	5.4	6.2	3.8	
Zimbabwe (1994)	4.3	4.9	3.1	decline
Zimbabwe (1999)	4	4.6	3	
Zimbabwe (2005/06)	3.8	4.6	2.6	

+ National Family and Fertility Survey 1990

* *2007-08 Tanzania HIV/AIDS and Malaria Indicator Survey (THMIS)*

Annex II: Projection of Ethiopian Population under four different fertility scenario

Total population (Millions) - (Total) (Male+Female)				
Year	Constant Fertility Scenario 2010-2050	Fast Fertility Decline Scenario 2010-2050	Medium Fertility Decline Scenario 2010-2050	Slow Fertility Decline Scenario 2010-2050
2010	84.52	83.38	84.52	84.52
2011	87.11	85.49	87.04	87.06
2012	89.78	87.58	89.58	89.63
2013	92.52	89.64	92.12	92.22
2014	95.3	91.65	94.63	94.8
2015	98.18	93.64	97.17	97.41
2016	101.16	95.63	99.72	100.06
2017	104.23	97.63	102.27	102.74
2018	107.4	99.63	104.84	105.44
2019	110.67	101.63	107.42	108.19
2020	114.06	103.64	110.01	110.97
2021	117.58	105.66	112.62	113.79
2022	121.22	107.67	115.24	116.65
2023	125.01	109.69	117.89	119.57
2024	128.96	111.71	120.56	122.54
2025	133.07	113.72	123.24	125.55
2026	137.33	115.72	125.93	128.62
2027	141.77	117.71	128.64	131.72
2028	146.4	119.67	131.35	134.88
2029	151.24	121.61	134.08	138.1
2030	156.25	123.5	136.8	141.36
2031	161.47	125.34	139.56	144.65
2032	166.89	127.12	142.36	147.98
2033	172.52	128.83	145.19	151.34
2034	178.37	130.46	148.05	154.72
2035	184.44	132	150.92	158.14
2036	190.72	133.52	153.79	161.58
2037	197.2	135.01	156.64	165.04
2038	203.9	136.48	159.47	168.51
2039	210.83	137.91	162.27	171.99
2040	217.99	139.3	165.05	175.47
2041	225.4	140.66	167.78	178.95
2042	233.07	141.97	170.46	182.42
2043	241	143.25	173.1	185.88
2044	249.22	144.47	175.69	189.33
2045	257.74	145.67	178.21	192.76
2046	266.54	146.8	180.66	196.16
2047	275.64	147.87	183.03	199.51
2048	285.06	148.86	185.32	202.83
2049	294.82	149.81	187.52	206.09
2050	304.94	150.68	189.63	209.32

Annex III: Projection of labor force under four different fertility scenarios

Labour Force Millions				
Year	Constant Fertility Scenario 2010-2050	Fast Fertility Decline Scenario 2010-2050	Medium Fertility Decline Scenario 2010-2050	Slow Fertility Decline Scenario 2010-2050
2010	42.30	42.30	42.30	42.30
2011	43.59	43.59	43.59	43.59
2012	44.93	44.93	44.93	44.93
2013	46.32	46.32	46.32	46.32
2014	47.74	47.74	47.74	47.74
2015	49.20	49.20	49.20	49.20
2016	50.70	50.67	50.70	50.70
2017	52.26	52.16	52.26	52.26
2018	53.86	53.67	53.86	53.86
2019	55.51	55.20	55.51	55.51
2020	57.23	56.77	57.23	57.23
2021	59.01	58.35	58.98	58.99
2022	60.84	59.91	60.77	60.78
2023	62.73	61.48	62.59	62.62
2024	64.67	63.03	64.44	64.49
2025	66.69	64.59	66.35	66.43
2026	68.79	66.15	68.28	68.40
2027	70.95	67.72	70.22	70.40
2028	73.16	69.26	72.17	72.40
2029	75.42	70.77	74.10	74.41
2030	77.74	72.26	76.03	76.43
2031	80.12	73.73	77.96	78.47
2032	82.58	75.21	79.89	80.52
2033	85.13	76.69	81.84	82.62
2034	87.78	78.17	83.81	84.75
2035	90.54	79.68	85.81	86.93
2036	93.46	81.14	87.81	89.14
2037	96.49	82.59	89.80	91.38
2038	99.63	84.01	91.79	93.63
2039	102.88	85.38	93.75	95.89
2040	106.23	86.70	95.68	98.16
2041	109.69	87.96	97.59	100.42
2042	113.27	89.16	99.47	102.68
2043	116.98	90.30	101.34	104.95
2044	120.85	91.37	103.19	107.23
2045	124.86	92.37	105.02	109.52
2046	129.00	93.30	106.83	111.81
2047	133.29	94.15	108.63	114.09
2048	137.74	94.92	110.43	116.36
2049	142.36	95.61	112.20	118.62
2050	147.14	96.21	113.97	120.89

Annex IV: Projection of new jobs required per year, under four different fertility scenarios

New Jobs Required Millions				
Year	Constant Fertility Scenario 1994-2050	Fast Fertility Decline Scenario 1994-2050	Medium Fertility Decline Scenario 1994-2050	Slow Fertility Decline Scenario 1994-2050
2010	1.29	1.29	1.29	1.29
2011	1.35	1.35	1.35	1.35
2012	1.38	1.38	1.38	1.38
2013	1.42	1.42	1.42	1.42
2014	1.46	1.46	1.46	1.46
2015	1.50	1.47	1.51	1.51
2016	1.55	1.49	1.55	1.55
2017	1.60	1.51	1.61	1.61
2018	1.65	1.53	1.65	1.65
2019	1.72	1.57	1.72	1.72
2020	1.78	1.57	1.75	1.76
2021	1.83	1.57	1.78	1.79
2022	1.89	1.56	1.82	1.84
2023	1.94	1.55	1.85	1.87
2024	2.02	1.56	1.91	1.93
2025	2.09	1.57	1.93	1.97
2026	2.16	1.56	1.95	2.00
2027	2.21	1.54	1.94	2.01
2028	2.26	1.51	1.93	2.01
2029	2.32	1.49	1.93	2.02
2030	2.38	1.47	1.92	2.03
2031	2.46	1.47	1.93	2.06
2032	2.55	1.48	1.96	2.09
2033	2.65	1.49	1.97	2.13
2034	2.76	1.50	2.00	2.18
2035	2.92	1.46	2.00	2.21
2036	3.03	1.45	1.99	2.24
2037	3.14	1.42	1.99	2.25
2038	3.25	1.37	1.96	2.27
2039	3.35	1.32	1.93	2.26
2040	3.46	1.26	1.91	2.26
2041	3.58	1.20	1.89	2.26
2042	3.72	1.14	1.87	2.27
2043	3.87	1.08	1.86	2.28
2044	4.01	1.00	1.82	2.29
2045	4.14	0.93	1.82	2.28
2046	4.29	0.85	1.80	2.28
2047	4.45	0.77	1.79	2.27
2048	4.61	0.69	1.78	2.26
2049	4.78	0.60	1.76	2.27
2050	4.96	0.53	1.74	2.27

Annex V: Projection of age dependency ratio under four different fertility scenarios

Dependency ratio - (Total) (Male+Female)				
Year	Constant Fertility Scenario 2010-2050	Fast Fertility Decline Scenario 2010-2050	Medium Fertility Decline Scenario 2010-2050	Slow Fertility Decline Scenario 2010-2050
2010	0.88	0.85	0.88	0.88
2011	0.88	0.84	0.87	0.87
2012	0.87	0.83	0.87	0.87
2013	0.87	0.81	0.86	0.87
2014	0.87	0.8	0.86	0.86
2015	0.87	0.78	0.85	0.86
2016	0.87	0.77	0.84	0.85
2017	0.87	0.75	0.83	0.84
2018	0.87	0.73	0.82	0.83
2019	0.87	0.71	0.81	0.82
2020	0.86	0.69	0.8	0.81
2021	0.86	0.68	0.78	0.8
2022	0.86	0.66	0.77	0.79
2023	0.86	0.64	0.75	0.78
2024	0.86	0.63	0.74	0.77
2025	0.86	0.61	0.72	0.75
2026	0.86	0.6	0.7	0.74
2027	0.86	0.59	0.69	0.73
2028	0.86	0.57	0.68	0.72
2029	0.86	0.56	0.66	0.71
2030	0.86	0.56	0.65	0.7
2031	0.87	0.55	0.64	0.7
2032	0.87	0.54	0.63	0.69
2033	0.88	0.53	0.62	0.68
2034	0.88	0.52	0.62	0.68
2035	0.89	0.51	0.61	0.67
2036	0.89	0.5	0.6	0.66
2037	0.89	0.48	0.59	0.66
2038	0.9	0.47	0.59	0.65
2039	0.9	0.47	0.58	0.64
2040	0.9	0.46	0.57	0.64
2041	0.91	0.45	0.57	0.63
2042	0.91	0.44	0.56	0.63
2043	0.91	0.43	0.56	0.62
2044	0.92	0.43	0.55	0.61
2045	0.92	0.42	0.55	0.61
2046	0.92	0.42	0.54	0.6
2047	0.92	0.41	0.53	0.6
2048	0.92	0.41	0.53	0.59
2049	0.92	0.41	0.52	0.59
2050	0.93	0.41	0.51	0.58

Annex VI: Trends in Primary School Completion rate

Year	Grade 5			Grade 8		
	Male %	Female %	Total %	Male %	Female %	Total %
1997 E.C. (2004/05)	65.2	49.5	57.4	42.1	26.3	34.3
1998 E.C. (2005/06)	69.2	56.0	62.7	50.1	32.9	41.7
1999 E.C. (2006/07)	71.6	61.6	66.6	51.3	36.9	44.2
2000 E.C. (2007/08)	71.7	67.0	69.4	49.4	39.9	44.7
2001 E.C.(2008/09)	79.4	78.4	78.9	48.4	40.5	43.6

Annex VII: Input data used for the spectrum projection

Indicators	Variables	Base Line [1994]	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2015	2035	2050	Primary Data Sources
Economy	Labor Force Participation of Males [10-14]	5[illegible]79	5[illegible]15	55.51	52.08	50.24	51.6	54.1	56.59	59.09	61.58	64.08	66.57							Census (1994, NLFS 1999, 2005)
	Labor Force Participation of Males [15-64]	81.03	81.31	81.78	81.68	81.56	81.42	82.11	82.77	83.43	84.1	84.76	85.43							Census (1994, NLFS 1999, 2005)
	Labor Force Participation of Males [10-14]	47.72	45.88	44.03	42.19	40.34	38.5	41.16	43.82	46.49	49.15	51.81	54.47							Census (1994, NLFS 1999, 2005)
	Labor Force Participation of Males [15-64]	63.57	63.63	63.7	63.76	63.83	63.89	65.78	67.66	69.54	71.43	73.32	75.2							Census (1994, NLFS 1999, 2005)
	Base year GDP in million at current market price	48[illegible]6																		MoFED
	Annual GDP growth rate [%]	5.2	11.3	4.5	2.8	4.2	5.3	5.9	7.2	1.6	7.1	10.7	12.4	11.5	11.9	11.2	10.1	10.1	10.1	MoFED

Indicators	Variables	Base Line [1994]	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2015	2035	2050	Primary Data Sources
Health	population per doctor				39109	42319	48469	50273	47836	35604	34019	35601	29777	35463	42768	37996		20000	20000	Ministry of Health
	population per nurse				1417	1254	1127	9459	8461	5236	4882	4572	3885	4217	4269	4735		5000	5000	Ministry of Health
	population per H. Center				226156	212348	202868	178387	171059	165155	155275	136829	121746	118218	111778	108225		25000	25000	Ministry of Health
	population per hospital				668011	625771	615720	616456	584036	584522	580899	561016	557388	543684	538830	531685		250000	250000	Ministry of Health
	population per hospital bed								6086	5743	5862	5776	5930	5562	5659	6027		3000	3000	Ministry of Health
	Annual health expenditure per person	6	6.2	6.4	9.5	11.2	17.9	8.1	11.5	11.3	11.9	13.2	16.8	13.3	15.5	23.3		100	100	Ministry of Health EEA Data Base

Indicators	Variables	Base Line [1994]	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2015	2035	2050	Primary Data Sources
Education	Age of entry into primary School	7																		Ministry of Education
	Number of years of primary schooling	8																		Ministry of Education
	Primary school enrollment rate [%]		26	30.1	34.7	41.8	45.8	51	57.4	61.6	64.4	69.4	79.8	85.8	91.70%		100	100	100	World Bank
	Students per primary school teacher			57	52	47	51	58	60	63	61	65	66	61	59			50	50	Ministry of Education
	Students per primary school		295	344	430	474	505	582	620	674	701	724	693	652	678			500	500	Ministry of Education
	Recurrent expenditure per primary school student														Br 205.00			Br 400	400	Ministry of Education
	Age of entry into secondary School	15																		Ministry of Education
	number of years of secondary schooling	4																		Ministry of Education
	secondary school enrollment rate [%]		13.42	12.74	12.39	11.62	11.7	13.2	13.8	15.3	16.9	18.7	21.1	25.3				60	80	World Bank
	students per secondary school teacher			55	55	58	42	43	46	48	45	48	51	54	48			40	40	Ministry of Education
	students per secondary school		1124	1161	1156	1224	1352	1394	1736	1681	1555	1512	1350	1425	1250			1000	1000	Ministry of Education
	Secondary school student														Br 455.00			Br. 800	800	Ministry of Education

Indicators	Variables	Base Line [1994]	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2015	2035	2050	Primary Data Sources
Urbanization	percent of urban population in major cities	13.65	13.9	14.1	14.31	14.51	14.72	14.92	15.14	15.35	15.57	15.78	16.02	16.23	16.48	16.72				CSA Census
	person per urban household	4.8																4	4	CSA Census

Indicators	Variables	Base Line [1994]	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2015	2035	2050	Primary Data Sources
Agriculture	Arable land in million hectares	51.50	51.50	51.50	51.50	51.50	51.50	51.50	51.50	51.50	51.50	51.50	51.50	51.50	51.50	51.50	51.50	51.50	51.50	EEA WB
	Base year production of major crops in thousands of MT	5091																		EEA Data Base 2003 FAO
	Annual growth in production of major crops [%]	-2.89	22.1	28	40438		-22.35	26047	21.028	-21.03	-24.76									FAO and CSA
	Annual per capital consumption of major crops in KG	102.07	124	159	147.82		123.81	125.7	155.45	120.72	96.426							158	158	FAO and MEDAC

Declaration

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

Yordanos Seifu		01-07-2010
Student	Signature	Date

I confirm that this thesis has been submitted with my approval as the supervisor of the same.

Berhanu Abegaz		1 July 2010
Advisor	Signature	Date