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Review and appraisal of research evidences generated to harness the demographic dividend in Ethiopia

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Annotation: *Ethiopia has been experiencing demographic transitions as a result of the country's efforts to reduce fertility and mortality rates through improving socio-economic changes. Achieving faster socio-economic growth requires transforming the young population into productive human capital. The objective of this critical review is to access and evaluate evidence-based efforts made in Ethiopia to harness the demographic dividend. The Article has used data from published research findings on specific topics, development plans, and program reports. A range of legal frameworks, policies, and programs related to health, education, economic development, good governance, and women's empowerment have been developed and implemented to improve the well-being of the population. Though positive and evidence-based achievements in education, health, fertility decrement, and economic reform were obtained, maintaining the quality of institutions and a lack of stockholder commitment have severely challenged the country, and as a result, changes were not extensive compared to other model countries in demographic dividend triumph. Therefore, continued efforts have to be made to reduce population growth and improve the accessibility and quality of socio-economic sectors so as to harness the demographic dividend and thereby change the living conditions of society.*

Key words: *Fertility, Maternal, Contraceptives, Child mortality, Infant mortality, Demographic dividend*

1. INTRODUCTION

Demographical Transition (DT) is a continual change of population indicators from an initially stationary population characterized by high mortality and fertility rates to one characterized by lower fertility and mortality rates (Bacci, 2017). During DT, mortality decline is followed by fertility decline, with the ultimate attainment of modern stationary low levels of fertility and mortality. This transition is usually accompanied by the development process that transforms an agricultural society into an industrial and urban one. During the transition, the population growth rate rises as the death rate declines while the birth rate remains high. Demographic Transition can be seen as a precondition for the demographic dividend, which is the economic benefit resulting from improved reproductive health, a decline in

fertility, and a subsequent shift in population age structure (Gribble and Bremner, 2012). The demographic transition increases the working-age population and decreases the dependent-age population (below 15 and above 64) due to sustained lower fertility. However, the decrease in the young-age population may be offset by an increase in old-age dependency.

The '***demographic dividend***' has its origins in a study of East Asian growth by Bloom and Williamson (1998). Bloom and Williamson used aggregate quantitative data to carry out cross-country econometric regression with the objective of calculating the contribution made by age structure dynamics to the boom in East Asian economic growth. They identified the role of the changing age structure in the economy taking off in East Asia and found the demographic dividend to account for between one-fourth and two-fifths of East Asia's "economic miracle (Bloom and Saches, 1998; Canning and Malaney, 2000). East Asian and Latin American countries have witnessed the benefits resulting from the demographic transition and subsequent change in age structure (Canning et al., 2015).

Currently, Ethiopia is considered a pre-dividend country that lies between stages 2 and 3 of the demographic transition. As a pre-dividend country, trend data shows that Ethiopia has made big strides on an issue that is important to achieving a demographic dividend (DDEI, 2020). According to Shelley and Kate (2014), Assefa et al. (2015), and Assefa (2012), Ethiopia has demonstrated its commitment to improving the lives of its citizens through proactive public policies and programs that have reduced child mortality, improved education, and increased access to family planning. As mortality and fertility levels decline, Ethiopia's working-age population may grow in relation to the number of young dependents, opening a window of opportunity for the accelerated economic growth known as the demographic dividend. Human capital investments and vigorous job growth are both crucial to achieving the economic growth associated with a demographic dividend.

Demographic change in Ethiopia would help harness a demographic dividend if policies and investments were tailored to fuel this potential for national economic growth and development (Louma, 2016). The demographic dividend is not assured or automatic; countries must earn it by implementing policies and strategies that will not only accelerate rapid fertility decline but also ensure that the resulting surplus labor force is well educated, skilled, and healthy (Gribble and Bremner, 2012; Louma, 2016). The purpose of this paper is to review the progress and efforts made on harnessing the demographic dividend in Ethiopia and identify the major knowledge gaps that may exist on these specific topics. In this endeavor, reference is also made to other related evidence. The findings are useful in providing a starting point for discussions, dialogue, and future research areas regarding the demographic dividend in Ethiopia.

The article is structured as follows: section two describes the demographic dividend conceptual framework; section three discusses data and methods; section four deals with the existing evidence harnessing the demographic dividend; and section five deals with empirical evidence accounts. Sections six and seven explain results, discussion, and critiques as well as the existing evidence harnessing the dividend, and the final section presents the conclusions.

2. Demographic dividend conceptual framework

On the path to achieving the demographic dividend, the age structure of the population should be changed as a precondition so that the dependency ratio could be lower in relation to the working-age population (Amare, 2020; Shelly and Kate, 2014). Youths are untapped resources, and if countries could invest in their health and education (Louma, 2016; AUC, 2017; Assefa *et al.*, 2017) with enormous

quality, their demographic as well as physiological behavior would be changed. Keeping political and other factors constant, changes in behavior make youth healthy and productive, which could produce both quality and quantity of products and services. Both quality and quantity of production enable countries to be competitive in global or international markets, which could boast economic growth. This would increase per capita gain, and the living standard of the population would improve (Gribble and Jason, 2012; Assefa, 2015). But all this works in an atmosphere where there is good governance, economic reform, and political stability (ECA, 2017).

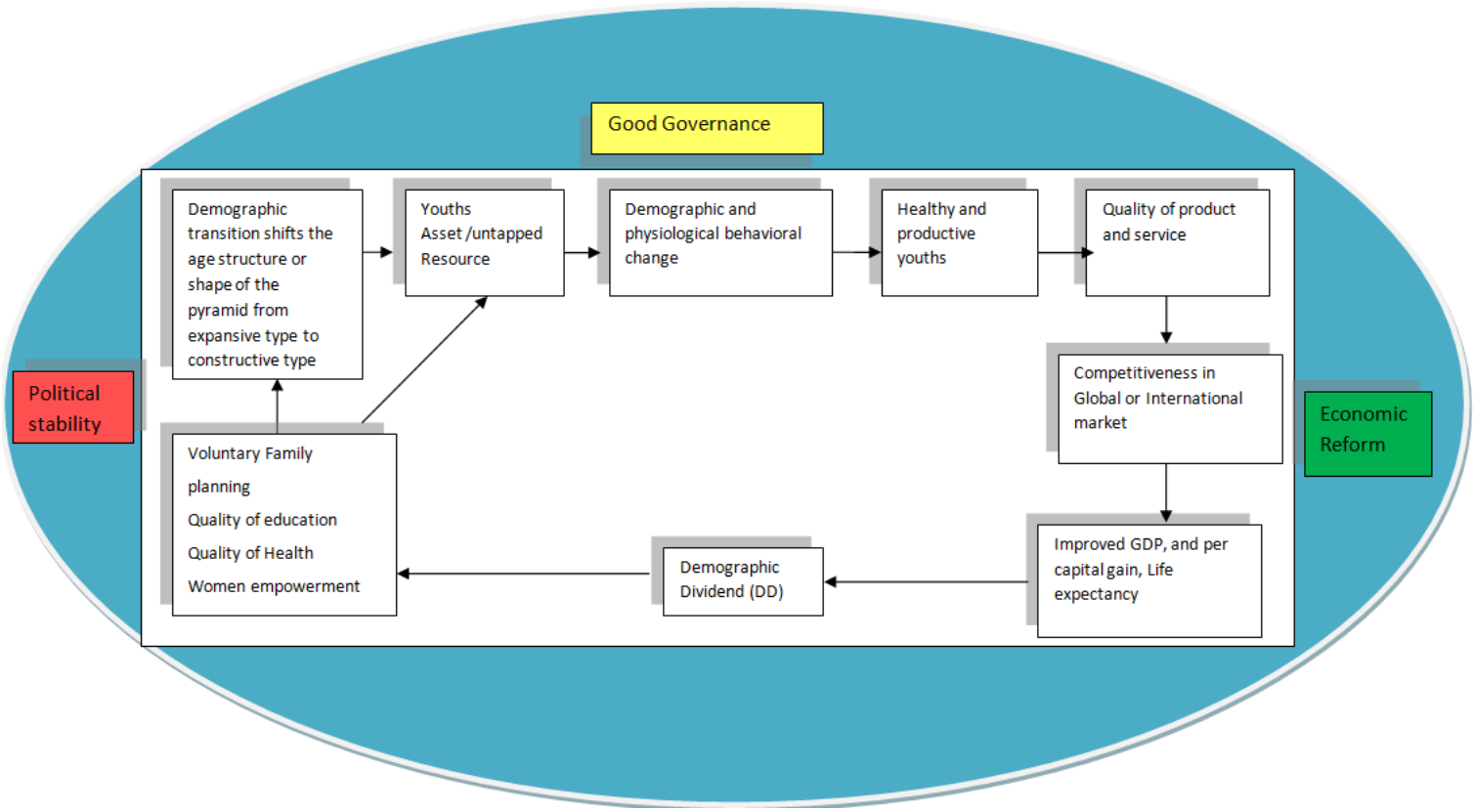

Figure 2:- A demographic dividend framework (self prepared).

3. Methodology

In this critical review, Specific and recent topics related to harnessing the demographic dividend in Ethiopia were accessed and reviewed. Furthermore, EDHS, development plans, and program reports were also used. Relevant population, health, and economic indicators were selected to review the progress made on harnessing the demographic dividend in Ethiopia. Indicators selected include TFR, infant mortality rate (IMR), child mortality rate (CMR), maternal mortality rate (MMR), CPR, education (primary to higher education), gross domestic product (GDP), GNI (Gross national income), and GCP (Gross capital formation). The analysis mostly relies on simple descriptive statistics. A serious analytical and content analysis of pertinent documents (national and global reports, scientific publications) was used as an approach.

4. Overview of existing evidence on harnessing the demographic dividend

Over the last two decades, Ethiopia has experienced an impressive decline in fertility, enjoyed strong economic growth, and made great strides in poverty reduction. According to Assefa et al. (2017), these achievements indicate that Ethiopia may be on track to reap a demographic dividend, but policymakers must act to both take advantage of opportunities and address remaining challenges.

In recent years, Ethiopia has extended health infrastructure and services to improve the health of its citizens, especially women and children, with significant improvements in indicators such as fertility, child mortality, and life expectancy. Reductions in fertility and mortality rates have yielded a rapidly growing youth population. The population aged 15–64 years in Ethiopia has increased from 52.8% in 1972 to 56.55% in 2020. Though the Population growth rate in Ethiopia is slowly declining, the size of the population has increased from 47.6 Million in 1990 to 115.9 Million in 2020 (CSA 1994% Macro Trends, 2020). TFR in Ethiopia has slowly decreased from 6.6 in 1990 to 4.8 in 2011 and further declined to 4.3 in 2019. Despite remarkable achievements in fertility reduction at the national level, this performance is not uniformly replicated at the sub-national level and between urban and rural settings. Fertility is consistently higher among rural women, who give birth to nearly three more children during their reproductive years than urban women (5.5 versus 2.6 children per woman) (EDHS, 2016).

CPR has increased from 3.9% in 1990 to 27% in 2011 and further increased to 41% in 2019 at both the national and subnational levels, with regional variations. Although urban women are more likely than their rural counterparts to use any method of contraception, use among currently married women in some rural areas has increased in recent years. For example, contraceptive use increased by more than six times in Amhara and SNNPR between 2000 and 2016. By contrast, in 2016, the contraceptive prevalence rate was only 2% in Somalia, where contraceptive use has actually declined. These trends have significant implications for fertility reduction and prospective gains from any demographic dividend (Assefa et al., 2018).

Overall, Ethiopia has made progress in catching up with peer countries and has a lower infant mortality rate than the average across low-income countries in Africa. The infant mortality rate has declined from 114 deaths per 1000 live births in 1994 to 47 deaths per 1000 live births in 2019. Similarly, the mortality rate of children under the age of five has declined from 211/1000 in 1994 to 69/1000 in 2019. Maternal mortality has also decreased from 1400/100,000 live births in the 1980s to 199/100,000 live births in 2019. Childhood mortality varies among regional states and is consistently higher in rural and emerging regions than in urbanized and advanced regions. The 2019 DHS report clearly illustrates that Benishangul Gumuz has the highest infant mortality rate at 74 deaths per 1,000 live births, while urban areas like Addis Ababa and Dire Dawa have the lowest infant and under-five mortality rates. Nevertheless, even in Addis Ababa, one in 26 children dies before their fifth birthday (EDHS, 2016 and 2019). Moreover**,** Ethiopia, nationally and regionally, still faces huge gaps in access to education, which plays a critical role in female empowerment, fertility reduction, and sustainable development (Shetty, 2015). Despite these gaps, Ethiopia has made significant strides. Primary school net enrollment rates reached 84% in 2016, a huge increase from less than 20% in the 1990s, and secondary education enrollment has similarly improved (CSA & EDHS, 2016). Government expenditures on education increased from 2.3 percent of GDP in the early 1990s to nearly 4.5% in 2016 (USAID, 2013). As is observed in health indicators, education outcomes vary significantly among the regional states. Addis

Ababa, Dire Dawa, and Harari have the highest literacy levels; Afar and Somali have the lowest literacy levels nationwide, followed by SNNPR and Amhara. In terms of economic growth, the gross domestic product (GDP) in Ethiopia has increased from $12.1 billion in 1990 to $107.65 billion in 2020. Observably, economic growth has brought a change in human capital, which is the health, skills, knowledge, and experiences possessed by an individual or a group of individuals (Terefe, 2018).

Finally, the rapid reduction in fertility and child mortality and the significant change in education enrollment have accelerated Ethiopia's path toward the demographic dividend. However, harnessing this dividend at the national level will depend on the regional states' ability to maintain and scale up investments in human capital.

5. Empirical evidence on harnessing the demographic dividend in Ethiopia

Various articles have been published in different years regarding the demographic dividend in Ethiopia, and different conflicting and supplementary evidence has been reported linking demographic transition to harnessing the demographic dividend (Amare, 2020; Shelly and Kate, 2014; AUC, 2017; Assefa *et al.*, 2015; Assefa, 2012; ESA,ESA 2017; DDIE, 2020; Hans et al., 2020).

According to the 2020 demographic dividend effort index, Ethiopia has made big strides on an issue that is important to achieving a demographic dividend. Assefa (2012) also mentioned that the socio-economic and demographic progress that has been taking place in the country in the recent past might lead one to conclude that Ethiopia is poised to accelerate economic growth even further through a demographic dividend. However, there are a number of challenges that outweigh the opportunities, such as a low level of savings, heavy dependency on rain-fed agriculture, the export of few primary agricultural products, being a landlocked country, etc. Similarly, Amare (2020) and Assefa et al. (2017) have mentioned that Ethiopia has made remarkable progress in social sectors and undergone rapid demographic change and argued that the country has achieved notable change in its health, economic reform, education, and contraceptive use, showing Ethiopia is on the verge of reaching its demographic window of opportunity and offering the possibility of a demographic dividend. According to Canning et al. (2015), sub-Saharan Africans are just starting the demographic transition; however, the age-structured change required for opening the window of opportunities to harness the demographic dividend has not yet occurred.

As Shelly and Kate (2014) have stated, Ethiopia has experienced strong economic growth accompanied by positive trends in poverty reduction over the last decade, but thegovernment must continue to give high priority to substantially lowering fertility and child mortality as well as increasing investments in health, education, and job creation. Moreover, Assefa (2012) and Assefa et al. (2017) have pointed out that creating a conducive policy environment through good governance practices is imperative since improved transparency and accountability of public institutions are vital to encouraging investment and fostering growth. Hans et al. (2020) have also pointed out that the evolving population age structure of Ethiopia may enable it to experience a demographic dividend. A favorable ratio of working-age population to dependents may enable the country to experience a demographic dividend; however, this requires that the working-age population be absorbed by the job market and contribute to the country's productivity increase and economic growth.

In general, Assefa (2012), Shelly and Kate (2014), Assefa et al. (2017), and EAS (2017) have argued that Ethiopia is on the right track to harness the demographic dividend, though it has not yet

occurred. Favorable policy environments (health and education and training policy, employment policy, family law) and the youth bulge are opportunities to harness the dividend, while high fertility, High dependency on rain-fed agriculture for food and export, unemployment, the mean age at first marriage, a low level of saving, and being a landlocked country are still challenges demanding extensive effort.

6. Analyzing existing evidence on harnessing the demographic dividend in Ethiopia

Harnessing the demographic dividend requires countries to simultaneously invest in ***five key pillars*** (Population structure, health, education, economic reform, and good governance) (ESA, 2017). Therefore, this article will examine the achievements and tangible progress made on those key pillars that harness the demographic dividend in Ethiopia. Recent emerging data were extracted from local and international databases (CSA, United Nations Population Prospects, Macro Trends and Treading Economics, Knoema, and CIA World Fact Book).

6.1 Data analysis

This section seeks to analyze access and evaluate progress and effort made on harnessing the demographic dividend in Ethiopia. Some key results are corroborated with the theoretical stipulations and empirical evidence noted in the preceding sections.

6.1.1 Population structure

The population aged 15–64 years has increased from 50.54% in 1990 to 52.26% in 2010. It further increased from 54.81% in 2015 to 56.55% in 2020, growing at an average annual rate of 0.51% and 0.34% during 2010–2015 and 2015–2020, respectively. Similarly, the median age of the population has slowly increased from 16.8 years in 1990 to 17.3 years in 2010. It further increased from 18.3 years in 2015 to 19.5 years in 2020, growing at an average annual rate of 0.2 and 0.24 years during 2010–2015 and 2015–2020, respectively. Moreover, the total dependency ratio has declined from 93.2% in 1990 to 87.8% in 2011 and further to 76.85% in 2020. (Table 1)

Table 1. Demographic indicators

Indicators /year	1990	2010	2015	2020
Median age	16.8	17.3	18.3	19.5
Average annual increase per year	0.2 (2010-2015)		0.24(2015-2020)	
Population aged 15-64	50.54%	52.26%	54.81%	56.55
Average annual growth per year	0.51%(2010-2015)		0.34%(2015-2020)	
Dependency ratio	93.2%	87.6 %	76.8%	76.85%
Average annual decline per year	2.16%(2010-2015)		0.01(2015-2020)	

Source (United nation population Prospects, 2020)

6.1.2 Total Fertility and population growth rate

TFR has decreased from 6.6 in 1990 to 4.8 in 2011. It further declined from 4.6 in 2016 to 4.1 in 2020, showing an average annual decline of 0.04 and 0.10 children per woman during 2011–2016 and

2016–2020 (Table 2). Obviously, fertility is declining; however, it was not as rapid as mentioned by Shelly and Kate (2014). Over a period of a quarter of a century, TFR in Ethiopia has decreased by only 2.5 children per woman, which is a very slow decline. Evidently, Thailand has decreased TFR from 5.5 in 1770 to 2.1 in 1990 (a 3.4 children per woman point decrease between 1970 and 1990).(Annex 1). **The Republic** of Korea also achieved replacement-level fertility between 1960 and 1990. Though the population growth rate is steadily declining from 2.8% in 2010 to 2.57% in 2020, a 0.23% reduction over the same period, the size of the population has increased from 47.6 Million in 1990 to 103.6 Million in 2016 and further increased to 115.9 Million in 2020 (showing an average annual increase of 2.15 and 2.46 Million per year during 1990–2016 and 2016–2020, respectively).

Table 2 Demographic and socio- economic indicators

Indicator/year	1990	2011	2016	2019	2020
Population growth	29.4M	90.1M	103.3M	112M	115M
% point change	206%(1990-2011)	14.7%(2011-2016)		11.6%(2019-2020)	
% point change(1990-2020)	291%				
Average annual growth per year		2.15(2011-2016)		2.46 (2016-2020)	
Population growth rate	3.68%	2.8%	2.75%	2.61	2.57%
Total fertility rate	6.6	4.8	4.6	4.2	4.1
% point change	27.3%(1990-2011)		4.2%(2011-2016)	11% (2019-2020)	
% point change(1990-2019)	37.9%				
Average annual decline per year		0.04(2011-2016)		0.10(2016-2020)	
Contraceptive prevalence rate	3.9%	27%	35%	41.4%	-
% point change(1990-2019)	592.3%(1990-2011)		29.6%(2011-2016)	18.3%(2016-2020)	
Average annual increase per year		1.26%(2011-2016)		1.28%(2016-2020)	
Gross domestic product	7.3B	31.9B	73.3B	95.91B	107B
% point change	336%	129%(2011-2016)		46%	
GDP growth rate	-	12.5%	9.43%	8.36%	6.06%
Average annual decline/ per year		0.21%(2011-2016)		0.46%(2016-2020)	
Per capital gain	$206	$342	$670	$856	$936
Gross national income	$12.29	$33.24	$68..94	$94.97	$102.6
Average annual increase per year		7.14(2011-2016)		6.73(2016-2020)	
Per capital GNI			9.51	8.07	6.06

Human development index		0.421	0.461	0.485	0.49
Infant mortality rate	114	59	48	47	-
% reduction	48.2%	18.6%(2011-2016)		0.02%(2016-2019)	
% reduction (1990-2019)	58.8%				
Average annual decline/ per year		2.2(2011-2016)		0.2(2016-2019)	
Under five mortality rate	211	88	69	67	
% reduction	58.3%	21.6%(2011-2016)		0.03%(2016-2020)	
% point change(1990-2019)	68.2%				
Average annual decline/ per year		4.2(2011-2016)		0.4(2016-2019)	
Maternal mortality rate	1400	676	412	199	
% reduction	51.7%	39.1%(2011-2016)		51.7%(2016-2019)	
% reduction (1990-2019)	85.8%				
Average annual decline/ per year		52.8(2011-2016)		42.6(2016-2019)	
Government effectiveness index			-0.64	-0.63	-0.55

Source (CSA, 2016; United nation population Prospects, 2020, Macro trends, 2020 and Treading Economics and CIA world fact book, 2020)

6.1.3 Family planning

CPR in Ethiopia has increased from 3.9% in 1990 to 27% in 2011. It further increased from 35% in 2016 to 41% in 2019, growing at an average annual rate of 1.6% and 1.28 % during 2011–2015 and 2016–2020. The CPR has improved the health and well-being of mothers and their children. There are regional disparities between rural and urban areas. CPR in rural areas has increased from 32.8% in 2016 to 38.2% in 2019, a 16.4% increment. Similarly, CPR in urban areas has decreased from 52% in 2016 to 47.7% in 2019, a 9.6% reduction. CPR was highest in Addis Ababa and lowest in Afar in 2016 and 2019. CPR in Addis Ababa and Afar has increased from 49.9% and 1.5% in 2016 to 55.9% and 3.4% in 2019, respectively (EDHS, 2019) (Table 2).

Ethiopia's strong investments in the health sector have contributed to significant progress in reducing infant and child mortality (Shelly and Kate, 2014). Undoubtedly, the infant mortality rate declined from 114 deaths per 1000 live births in 1994 to 59 deaths per 1000 live births in 2011. It further declined from 48/1000 in 2016 to 47 deaths per 1000 live births in 2019, with an average annual decline of 2.2 and 0.25 deaths per 1000 live births during 2011–2016 and 2016–2019. Likewise, mortality among children under the age of five has shown a significant and progressive decline, from 211/1000 in 1994 to 88/1000 in 2011. It further declined from 67/1000 in 2016 to 69/1000 in 2019, showing an average annual decline of 4.2 and 0.5 deaths per 1000 live births during 2011–2016 and 2016–2019, respectively. Maternal mortality has also decreased from 1400/100,000 live births in the 1980s to 676/100,000 live births in 2011. It further declined from 412/100,000 live births in 2016 to 199/100,000 live births in 2019, with an average annual decline of 52.8 and 53.25 deaths per 100,000 live births during 2011–2016 and

2016–2019 (EDHS, 2019; PDC, 2020) (Table 2). There are regional disparities between rural and urban areas. Infant mortality in urban areas has declined from 54/1000 in 2016 to 32/1000 in 2019, a 40.7% reduction. Similarly, Infant mortality in rural areas has declined from 62 per 1000 in 2016 to 51 per 1000 in 2019, a 17.7% reduction. IMR was lowest in Addis Ababa and highest in Benishangul Gumuz in 2016. IMR in Addis Ababa and Benishangul Gumuz have declined from 28/1000 and 47/1000 in 2016 to 21/1000 and 74/1000 in 2019, respectively (Table 2).

Beside family planning and reproductive health improvement, various changes have been noted in women's empowerment so far. Abduction declined from 23.3% in 1997 to 12.7% in 2010, showing an average annual decline of 0.81% during 1997–2010. Similarly, women's access to political power and decision-making improved significantly, and their representation in parliament increased from 2.7% in 1995 to 38% in 2020, growing at an average rate of 1.41% during the same period. Female participation in the labor force has increased from 66.5% in 1994 to 73.31% in 2019, growing at an average annual rate of 0.27% during the same period (World Bank, 2020).

6.1.4 Education

Gross primary school enrollment rates rose from 55% in 2000 to over 100% in 2015, showing average annual growth of 3% per year over the same period, though completion rates were substantially lower, rising from 22% to 54% over the same period (WDI, 2020). Gross secondary school enrollment rose from 13% in 2000 to 48.5% in 2019, growing at an average annual rate of 1.84% per year over the same period (WDI, 2020). The number of public universities has increased from 3 in 1986 to 45 in 2019, showing average annual growth of 1.27 universities per year, alongside a rapidly multiplying private sector. TVET institutions increased from 458 in 2008 to 672 in 2019, showing average annual growth of 19.54 TVET institutions per year (PDC, 2020). Gender parity indices were 0.84 and 0.96 at the primary level in 2005 and 2015 and 0.7 and 0.95 at the secondary level over the same period of time, respectively (Kerilyn and Legass, 2021).

6.1.5 Economic Reform

GDP has increased from $12.1 billion in 1990 to $31.9 billion in 2011. It further increases from $73.3 billion in 2016 to $107.65 billion in 2020, showing an average annual decrement of 0.21% and 0.46% during 2011–2016 and 2016–2020, respectively. Gross capital formation (gross domestic investment) in Ethiopia has also increased from $1,782 million in 2000 to $32,641 million in 2019, growing at an average annual rate of 17.64% (PDC, 2020). Moreover, GNI has increased from $12.29 billion in 1990 to $33.24 billion in 2010. It further increased from $68.94 billion to $102.6 billion in 2020, showing an average annual growth of 7.14 billion and 6.73 billion during 2011–2016 and 2016–2020 (Table 2).

6.1.6 Good Governance

In addition to the formulation and implementation of adequate policies in the areas of population, education, health, and gender equity, SSA countries will need to design and implement sound economic policies and improve good governance (Hans et al., 2019). Assefa et al. (2015) have pointed out that good governance practices are also important pillars that encourage investment and foster growth. Reaping the demographic dividend requires the government to put in place fiscal policies and economic and social reforms that enhance saving, attract foreign direct investment (FDI), and ensure efficiency and accountability in the use of public resources. A well-developed infrastructure can reduce transaction costs,

increase savings, enable economic efficiency, and increase labor productivity by easing movement. Infrastructure and saving are another very important element for driving growth in a positive direction (Assefa, 2012). Shelly and Kate (2014) and Assefa et al. (2017)

1. **Critiques on existing progress made on harnessing the demographic dividend in Ethiopia**

Population structure: The population pyramid of Ethiopia is not very endearing and still requires transition from the broad base (heavy child) to the narrow base (worker-heavy) in such a way that it could be suitable for achieving the demographic dividend. The Republic of Korea, Thailand, and China have made a fast transition and increased the share of their working-age population by more than 70% during the period 1960–2010 (ESA, 2017). The rapid changes in contraceptive prevalence and TFR have made these East Asian countries one of the biggest family-planning success stories in Asia (UN, 2012).

Even though the population age structure of Ethiopia began to shift, the population is still growing and the lives of most people have not changed; nearly 24% of Ethiopia's population still lives in extreme poverty (World Bank, 2020). However, revised family law (2000) increased the age of first marriage to 18 years; 40% of Ethiopian girls are still married before they turn 18 years old, and 14% are married before they turn 15 (Atlas, 2019). Surprisingly, Ethiopia is the 16th-highest nation in the world for child marriage. Moreover, the adolescent fertility rate is still high at 64.3 per 1000 women aged 15–19 in 2019 (World Bank, 2020). Therefore, young women are still exposed to high rates of maternal mortality due to childbirth and unsafe abortion, and great attention has to be given to enforcing revised family law and increasing massive voluntary family planning information and services throughout the country (Gribble and Jason, 2012).

Family planning: besides the evident achievements in CPR, infant, child, and maternal mortality, and women's empowerment, further critical attention is still required on increasing contraceptive prevalence rates and addressing women's empowerment issues. Even though Shelly and Kate (2014) and Assefa et al. (2015) have mentioned that all progress is remarkable, Thailand and the Republic of South Korea could have achieved fast family planning and reproductive health over a short period of time. For instance, Thailand has evidently increased the contraceptive prevalence rate from 15% in 1970 to 75% in 1990, which is 5-fold in less than 20 years (Annex 1). Their national family planning program (1971) and universal health coverage program (2002) have helped them a lot with this remarkable change. Similarly, the Republic of South Korea has also registered a sharp decline in infant mortality rates, from 80/1000 in 1960 to 6.1/1000 in 1990. Therefore, both knowledge and use of family planning information should be promoted in Ethiopia, especially in rural areas, since it contributes to child health by promoting healthy timing and spacing of pregnancies.

Moreover, there is still the highest unmet need among married adolescents aged 15–19. Twenty-two percent of currently married women have an unmet need for family planning (EDHS, 2016). The gender equality issue is also quite important. According to James and Jason (2012) and Assefa et al. (2015), a gender-equitable environment is also critical to achieving a demographic transition because, in such a setting, women are free to access and use family planning without many of the barriers they currently face. Though female participation in the labor force increased, it was a less than 10% point increase over a period of 25 years and needs much improvement. According to the UNDP gender inequality report 2019,

Ethiopia has the lowest Gender inequality index value of 0.517, ranking it 125 out of 162 countries (UNDP, 2019).

Regardless of child survival, Ethiopia is making great progress, but 1 in 17 children is still dying before age five (EDHS, 2019). Declining infant and child mortality has a direct effect on fertility levels; therefore, the quality of reproductive health services should be given immense attention so as to meet sustainable development goals aimed at reducing the maternal mortality ratio to less than 70 per 100 000 live births, neonatal mortality to at least as low as 12 per 1000 live births, and under-5 mortality to at least as low as 25 per 1000 live births. Even though health expenditures in Ethiopia have increased from US$5.38 per capita in 2000 to US$24.95 in 2018, they are still well below the World Health Organization's recommended level for low-income countries of US$60 per capita (World Bank, 2018), and the government should increase the amount as well as its commitment to make the sustainable development goals reliable and achievable.

Education: Despite all the progress in the measures of both gross and net enrolment in primary, secondary, and tertiary education, low levels of education quality and high drop-out rates remain major challenges for the achievement of universal basic education and a smooth school-to-work transition. Although secondary school enrollment rose from 13% in 1999 to 48% in 2019 (WDI, 2020), Ethiopia has the world's third-largest out-of-school population. Since secondary education levels help to delay marriage and first pregnancy, immense attention should be given to reducing high school drop-out rates (OECD, 2012). Though noticeable expansive progress is observed in higher education, the policy has to be flexible or adaptive in response to the change in labor market needs. As the economy grows and becomes more sophisticated, workers need a diverse range of skills in business and technology (Gribble and Jason, 2012; PDC, 2020). Beside the expansion of technical and vocational education, maintaining the quality of training still requires extensive endeavor so as to produce an innovative, technologically savvy young generation that is able to transform Ethiopia's market and needs quite a bit of reform.

Economic reform: Although several countries with high fertility and low development indicators exhibit relatively high levels of economic growth, the growth has not improved the living standards of most people (Gribble and Jason, 2012). Undoubtedly, Ethiopia has experienced impressive economic growth over the last decade (Shelly and Kate 2014). But population growth rates, which are about 2.5% per year, have slowed per capita gains, and more than 70% of people survive on less than $2 per day (PDC, 2020). Therefore, to achieve higher per capita gains, Ethiopia will need to reduce its population growth rate and increase massive investment and political support for voluntary family planning (Gribble and Jason, 2012).

However, the economy is not generating enough jobs; about 600,000 individuals enter the Ethiopian labor force every year, and this worsens the unemployment rate (World Bank, 2018). According to the Trading and Economic Report (2019), the unemployment rate in Ethiopia increased from 16.90% in 2016 to 19.10% in 2018, growing at an average annual rate of 0.73% during the same period. Youth unemployment has reached nearly 25 percent in 2019 (DPC, 2020).

Undeniably, the total dependency ratio has decreased from 93.2% in 1990 to 76.8% in 2020 (a less than 10% point change over 50 years), which means four working people per three dependents in the household, which in turn affects the level of saving. For that reason, governments must continue their efforts to implement economic policies that encourage and attract foreign investment, create jobs, and

expand manufacturing infrastructure, as outlined in the recent 10-year development plan (2021–2030). In addition, trade policies that create markets for domestically produced materials are one of the keys to fostering economic growth (Assefa *et al.* 2015). Developing incentives for entrepreneurship, such as the government subsidizing entrepreneurs to search for profitable business opportunities, may be a viable avenue for increasing the number of micro- and small-scale enterprises in Ethiopia and improving their profits (Gribble and Jason, 2012; AUC, 2017).

Good governance: Though GDP, GNP, and GDI are slowly increasing, the savings rate in Ethiopia has declined significantly for the last three years. The gross domestic savings (% of GDP) in Ethiopia have decreased from 24.08% in 2018 to 20.91% in 2020, declining at an average annual rate of 1.05% (World Bank, 2020). This has a considerable influence on job creation and youth employability. Moreover, the World Bank Group's (2020) report showed that good governance practice in Ethiopia is classified as weak. According to the report, Ethiopia has a weekly governance index value of -0.51 (-2.5 weak; 2.5 strong). The index is measured based on perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the Government's commitment to such policies.

Is Ethiopia on the right track to harness the demographic dividend?

There is no clear cut to identify which country is on the right path to harnessing the demographic dividend. Scholars put forward their own arguments after accessing the progress, particularly in health, education, and economic growth. As newly emerging socio-economic and demographic data in Ethiopia have shown, it might be difficult to conclude Ethiopia is doing well regarding demographic division, especially in the past five years, due to the following reasons:

- TFR is declining very slowly, with less than one child per woman during 2011–2020.
- The population growth rate is slowly declining at an average of 0.23% per year during 2011–2020.
- The GDP growth rate is declining at an average of 0.34% per year during 2011–2020.
- The unemployment rate is increasing at an average of 73% during 2016–2018.
- Week governance index of -0.55 (WBG, 2020)
- Ethiopia has the lowest gender inequality index of 0.517 (UNDP,2020)
- The saving rate is declining at an average of 1.05% per year during 2018–2020. (Trade Economics,2020)
- The dependency ratio is declining very slowly at an average of 0.54% per year from 2011 to 2020.
- CPR in urban areas is declining at an average of 3% during 2016–2019.

4. CONCLUSION

In Ethiopia, various populations' related programs and policies were implemented, and changes have been observed in the last three decades. As Hans et al. (2020) and Assefa et al. (2017) mentioned, Ethiopia has also made remarkable progress in demographic change and economic performance. Population Policy and programs had made the families choose fewer and healthier children when they knew that each child had a better chance of surviving (Amare, 2020). Since the policy was launched in 1993, some NGO and government sectors have been providing family planning and reproductive health

services integrated with other development activities. As a result of this, fertility, infant, under-five, and maternal mortality have significantly declined. Despite this undeniable progress, further work is required to match Ethiopian population growth with economic development and harness the demographic dividend. Some Ethiopian regional states are also not progressing sufficiently in terms of the main drivers of the demographic dividend and thus require special and intensified attention. With increased attention to reducing health and education inequality between regional states and effective implementation of supporting policies, Ethiopia could earn a large demographic dividend and improve the quality of life for its inhabitants nationwide.

Declarations

Ethics approval and consent to participate – not applicable

Consent for publication – there is no restriction on publication

Availability of data and materials – not applicable

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Annex 1: Thailand's Demographic and Economic Indicator

Indicators	**Thailand**			
	1970	1990	2010	2019
Population growth	36.8Mi	56.5Mi	67.1Mi	69.6Mi
Population growth rate	2.7%	1.41%	0.49%	0.28%
Median age	18	24.3	35.5	88.3
TFR	5.5	2.2	1.5	1.5
CPR	15%	75%	80%	73%
GDP	6.6 B	85 B	341B	544B
GDP growth rate	11.4%	11.1%	7.5%	2.2%
Per capital gain	$192	%1509	$6861	$7816
Dependency ratio	90.4	53.2	39.2	39
Human development index		0.577	0.72	0.77

Annex 2: Ethiopia Demographic and Economic Indicator

Indicators	**Ethiopia**			
	1970	1990	2010	2019
Population growth	29.4 Mi	47.6Mi	87.6Mi	115 Mi
Population growth rate	2.76%	3.68%	2.8%	2.5%
Median age	15.4	15.4	18.1	19.5
TFR	6.9	7.7	4.6	4.3
CPR	-	3.9%	27%	41%
GDP	7.3B	12.1B	27.9B	96.0 B
GDP growth rate		5.8%	12.5%	6.1%
Per capital gain	$206	$284	$342	$856
Dependency ratio	87.6	97.9	93.2	76.8
Human development index		0.292	0.421	0.485

Source (UN population prospect, 2020, EDHs, 2000-2019, World meter, thread and economics, 2021).

