

**The KENYA INSTITUTE for PUBLIC  
POLICY RESEARCH and ANALYSIS**

# **Investing in the Youth to Realize Demographic Dividends in Kenya**

**Winnie Makau and Mohammad Maamun**

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**THE KENYA INSTITUTE FOR PUBLIC POLICY  
RESEARCH AND ANALYSIS (KIPPRA)**

**YOUNG PROFESSIONALS (YPs) TRAINING  
PROGRAMME**

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Kenya Institute for Public Policy  
Research and Analysis

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## Abstract

*Countries the world over have achieved rapid economic growth by virtue of demographic dividends, especially through the youth. Kenya has yet to achieve its development goals despite having a youth bulge. The study used cross-sectional data obtained from the Kenya Integrated Household Budget Survey 2015/16 to analyze the determinants of realizing youth dividend. The empirical results showed that higher dividends are obtained from having tertiary education; youth in non-agricultural sectors realize higher dividend than their counterparts in agriculture; access to information and communication technology would increase dividends especially for the youth; health insurance coverage and access to healthcare are critical to realizing youth dividend; reducing dependency ratio accelerates the achievement of youth dividend; there are higher dividends in empowering women; and development in both rural and urban contexts increases youth dividends. These results highlighted areas in which the government could consider increasing investment to reap youth dividends. There is need for the government to encourage the youth to enrol in tertiary education, and improve the quality of vocational and tertiary education in rural areas. Promotion of reproductive health initiatives by the National and County governments and increasing insurance coverage for the youth would reap youth dividends and reduce the dependency ratio. There is need for the government to make agriculture more appealing for the youth by promoting the use of innovative technology in production, provision of credit and land-leasing services to youth and developing rural infrastructure. Improving access to information and communication technology by investing in infrastructure and introducing digital skills at a young age would enhance access to information on employment, training and the gig economy. There is need to create awareness on opportunities available to the youth in training, employment and participation. Additionally, the country is poised to reap from a demographic dividend by enhancing youth productivity, and accomplishing the various development frameworks such as the Kenya Vision 2030 and the Demographic Dividend Roadmap.*

## **Abbreviations and Acronyms**

AGPO	Access to Government Procurement Opportunities
AU	African Union
ICT	Information Communication Technology
KIPPRA	Kenya Institute for Public Policy Research and Analysis
KNBS	Kenya National Bureau of Statistics
KPHC	Kenya Population and Housing Census
NCPD	National Council for Population Development
NEET	Youth Not in Education, Employment or Training
PFM	Public Finance Management
SDGs	Sustainable Development Goals
TVET	Technical and Vocational Education and Training
UNFPA	United Nations Population Fund
UN	United Nations

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## **1. Introduction**

The logic of a demographic dividend is that with a large youthful and productive working age group, a youth bulge and the right policies in place, a country can achieve rapid economic growth. The demographic dividend is a temporary window of opportunity to achieve rapid socio-economic development occasioned by a decline in fertility levels and strategic investments in key sectors, i.e., health, education, economy and governance (NCPD, 2020). It encompasses the economic benefit of having a larger youthful and productive workforce, compared to a dependent population. The potential for economic growth through the demographic dividend is explained in the changes in a population structure. The age structure plays a critical role of providing labour for economic growth where a change in the fertility and mortality rates culminates in a change in the total population and the composition of age cohorts.

A country, for instance, with a high population of children and elderly people is likely to devote a lot of its resources to caring for them. These two groups, children under 15 years and the elderly above 65 years, are classified as exclusive consumers in an economy. Conversely, if a country's population falls within the working age group that is highly productive, the right policies regarding health, innovation, education, entrepreneurship and finance can create a ripe environment for wealth creation (Bloom, Canning and Sevilla, 2003).

The relationship between population dynamics and economic growth were primarily explored in East Asian countries and culminated in what is often referred to as the Asian Miracle in countries such as Japan, South Korea, Singapore, Hong Kong, and Thailand. These countries experienced unprecedented rapid industrialization and economic transformation due to a temporary decline in birth rates, which reduced dependency ratios and the proportion of the working age population. These countries also heavily invested in human capital, especially education and health, which largely expanded the per capita productive capacity of their economies (Bloom and Williamson, 1997). They also implemented sound policies regarding the economy and governance structures to provide an enabling environment for the productive youthful working age population to thrive.

African countries have witnessed a growth in population in recent decades that has had both positive and negative effects on economies due to increased pressure on scarce resources. The continent has the largest share of the world's young population at the median age of 19.7 compared to 42.5 in Europe and 38.6 in Northern America. As of 2020, an approximated 60 per cent of Africa's population was below 25 years, and this number is expected to rise in the future (Rocca and Schultes, 2020). In 2017, the African Union (AU) road map on "Harnessing the



Demographic Dividend through Investment in Youth” was developed with an aim to transform the potential of Africa’s large youth population into a demographic dividend. It is also intended to help accelerate African countries towards their aspirations and goals of 2030 Agenda for Sustainable Development and the AU complementary Agenda 2063.

Kenya has taken steps to cement its efforts towards achieving a demographic dividend through the Kenya Demographic Dividend Roadmap of 2020-2030 (NCPD, 2020). The main objective of the roadmap is to harness the potential of Kenya’s large youth as the key drivers of economic growth. This shows Kenya’s commitment to realizing the full potential of the large population of the youth by addressing the challenges they face and enhancing their productivity. The National Adolescents and Youth Survey of 2015 by the National Council for Population and Development (NCPD) was carried out to establish issues and challenges that would hinder Kenya’s efforts to achieve a demographic dividend. Health, economic, governance and social sectors were assessed across the 47 counties. Among others, the challenges identified include lack of skills and training, school dropout rates, drug and substance abuse, lack of employment opportunities, low involvement in governance matters, and poverty.

Kenya is yet to achieve the projected annual economic growth rate of 10 per cent towards the attainment of the Kenya Vision 2030, having attained 7.5 per cent growth in 2021, the highest in the planning period of the Kenya Vision 2030. This is besides the country having a high population of youth comprising 53 per cent of the total labour force (KNBS, 2021 Q1), which would be expected to provide demographic dividends. In addition, Kenya stands to lose out on demographic dividend if its youth are not educated and skilled, empowered and in good health. However, approximately 3 million (16.9%) of youth in Kenya were not in education, employment or training (NEET) by 2021. Further, access to quality and affordable healthcare that is equitable remains a major challenge for Kenya, limiting the productivity of its labour force, including the youth.

There have been research initiatives addressing the demographic dividend in Kenya, including Nduati (2017) and Kimenyi, Mwega and Ndung’u (2016). Nduati (2017) focused on the working age group to gauge Kenya’s potential at the macroeconomic level for a demographic dividend against the backdrop of high rates of unemployment, high fertility rates and the consequences of idle youth. Kimenyi, Mwangi and Ndung’u (2016) assessed the labour market dynamics and prospects for a demographic dividend for Kenya, alongside other five states. Their study focused on the macroeconomic performance of Kenya’s economy and the role of political economy and the policy environment. However, these studies

focused on the macroeconomic level, leaving a gap on understanding how the demographic dividend can be achieved through microeconomic analysis.

This study contributes to the body of knowledge by assessing the prospects of a demographic dividend through the youth by using the household unit for analysis and limiting the scope to those aged 15 years to 34 years. By applying micro level analysis, the study assesses the prospects of realizing the dividends through determinants of productivity for youth-headed households and areas of intervention in policy.

Many countries have achieved economic growth and development by virtue of their investment in their youth through proper socio-economic policies, transforming their economies from low productivity to high productivity. Kenya has great potential for achieving the demographic dividend especially through its majority youth population. The Kenya Demographic Dividend Roadmap 2020-2030 identifies the youth as the key driver to Kenya achieving a demographic dividend, and this can be achieved through strategic investments in the youth to improve their productivity in the economy. This study sought to contribute to Kenya's policy in providing policy prescriptions for investment in the youth for economic transformation as in countries such as Thailand and South Korea.

The overall objective of this study is to assess the potential areas of investment to attain demographic dividends in pursuit of economic transformation. To this end, the study focuses on determinants of youth productivity in Kenya to inform policy interventions towards maximizing demographic dividends. The data used in the study's analysis did not fully explore all thematic pillars of demographic dividend as envisioned in the Kenya Demographic Dividend Roadmap (governance participation, human rights, empowerment of the youth and access to the export markets).

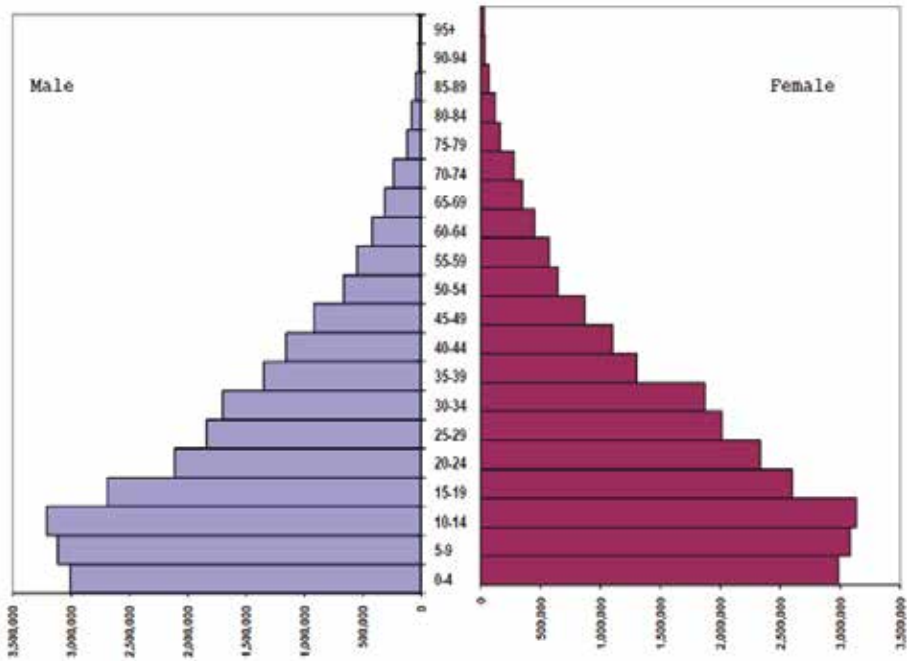
The rest of the paper is organized as follows: section 2 looks at the status of the youth in Kenya and policy developments in key sectors; the theories on the demographic dividend and empirical literature are reviewed in section 3; section 4 discusses the methodology applied in this study followed by section 5 which discusses the study findings, while section 6 makes conclusions and policy recommendations.

## **2. Youth and Policy Developments in Kenya**

A youth bulge occurs when more than 20 per cent of a country's population is made up of the youth, ideally between 15 years and 34 years of age depending on the country's definition of youth (Hope, 2012). The In Constitution of Kenya Article 260 considers any individual aged 18 and below 35 years as youth, while other organizations such as the United Nations define the youth age group as 15-24, the African Union Youth Charter use the 15-35 age group, and the Commonwealth of Nations defines the 15-29 cohort as youth. The age group of 15 to 34 is described as the period in individuals' lives when they are at the height of their learning and working potential (Krishnan and Sethuramalingam, 2017). This research adopts the definition by the African Youth Charter of youth as those aged between 15 and 34 years. These youth face multiple challenges that are persistent and limiting to their participation in national development, such as unemployment, skills mismatch, impediments in accessing education and training opportunities and multidimensional poverty.

Kenya's population size has grown exponentially over time. The 2019 Kenya Population and Housing Census estimated the population at 47.6 million, indicating a 2.2 per cent growth rate from the 2009 census. The dominant population is the youth and children aged zero (0) to 34 years, who make up 75.2 per cent of the population, and this structure is unlikely to change in the coming years. The active labour force in the country in 2019 was 57 per cent, made up of the age group between 15 and 64 years, and the elderly, above 60 years, make up 6 per cent of the total population (KNBS, 2019). The slight decline in total fertility rate from 4.6 per cent in 2009 to 3.9 per cent in 2014 is attributed to increased prevalence and use of contraceptives, which has increased in the intercensal period (UNFPA, 2020), reducing the dependency ratio. The dependency ratio was estimated at 75 per cent in 2019, indicating that for every 100 persons in the working age, 75 persons under the age of 15 and above 64 years were dependent on them.

**Figure 1: Population pyramid of Kenya 2019**



*Source: KNBS (2019), Population and Housing Census*

The youth population in Kenya has consistently constituted over half of the working age population (15-64) since the 1960s, increasing over time with a peak in 2002 at 67.7 per cent. The youth can be classified into two broad categories of school-going youth who are generally inactive economically (15-24 years) and those that are actively seeking employment or are employed (25-34 years). Kenya is poised to benefit from a demographic dividend owing to increased innovation and savings, and an increasing labour force arising from the youth bulge (Kimenyi, Mwega and Ndung'u, 2016).

Odoh and Eme (2014) argue that the youth are of importance to countries, and their creativity and productivity is a driving force for economic growth. They are drivers of development by providing an active and productive workforce, but also because they can strengthen or destroy the fabric of social order. They assert that Africa's biggest challenge in recent years has been and remains to be how to provide its largely youthful population with opportunities for decent living and contributing to economic transformation. While the challenges facing the youth vary from one country to another in the continent, issues of unemployment, low participation in governance and poor health are cross-cutting in African states.

## **2.1 Youth Profile in Kenya**

The youth are a great resource for a country's growth, and the long-term benefits of the accumulation of human capital through proper youth investment in education and economic development provide a firm basis for economic transformation. Failure to plan and implement investments on the youth would result in a country missing out on a demographic dividend (Gribble and Bremner, 2012). Having a large youth in a country is both an opportunity and a risk, and engaging them and empowering them for constructive involvement in Kenya's development process is no longer a choice but a matter of priority for Kenya. Further, the youth are the most abundant asset that Kenya has or is poised to have in the near future, which necessitates government prioritization to address the challenges they face (Hope, 2012). These challenges include multidimensional poverty, unemployment and underemployment, skills mismatch, education and training challenges and a widening skills gap.

Table 1 highlights the profile of the youth in Kenya, sourced from the population censuses conducted in 2009 and 2019 and the KNBS labour force report from the first quarter of 2021. 36 per cent of the country's population is made up of youth aged 15 to 34 years, making up more than a quarter of the total population. These are youth in their prime productive age, and strategic human capital investments could reap a demographic dividend. Making up more than half of the active workforce at 53 per cent, the youth are an important resource for Kenya to transform into a high productivity economy.

A significant percentage of the youth work in the informal sector, though the number has reduced from 46.9 per cent in 2009 to 34.1 per cent in 2019. Those in the formal sector have also increased from 22.4 per cent in 2009 to 29.9 per cent in 2019, with an increase in youth employed in agriculture increasing to 36.1 per cent in 2019 from 30.8 per cent in 2009.

**Table 1: General youth profile in Kenya**

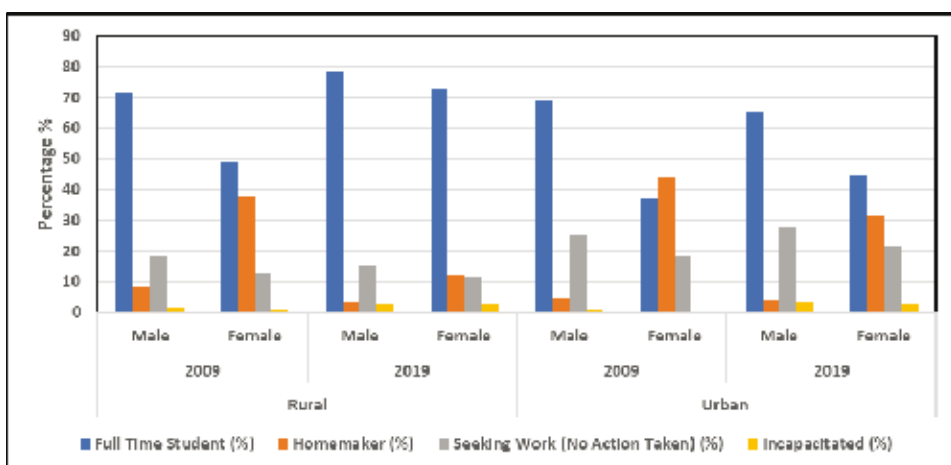
<b>Indicator</b>	<b>%</b>
Proportion of youth (15-34) in total population	36
Proportion of total youth, female	51
Proportion of total youth, male	49
Proportion of youth to total work force	53
Youth total unemployment rate, 2020	10
Multidimensional Poverty, Youth, 2019	41.7

Youth not in education, employment, and training (NEET) Q1, 2021	16.9
Youth in informal employment 2009	46.9
Youth in informal employment 2019	34.1
Youth in formal employment 2009	22.4
Youth in formal employment 2019	29.9
Youth employed in agriculture 2009	30.8
Youth employed in Agriculture 2019	36.1

Source: KNBS (2009; 2019), Kenya Population and Housing Census;KNBS (2021), Labour Force Report 2021 Q1

Figure 2 highlights the distribution of youth outside the labour force in 2009 contrasted against the number in 2019, most of whom are full-time students. Between 2009 and 2019, the number of youths that became full-time students increased significantly from 59.2 per cent to 75.8 per cent in rural areas. The increase in the share of students was attributed to introduction of Free Day Secondary Education in 2008, and the growth in number and capacity of Technical, Vocational, Education and Training (TVET) and university education (KNBS, 2019). The number of youths seeking employment in rural areas declined from 15.5 per cent to 13.6 per cent during the intercensal period while those in urban areas increased significantly from 20.8 per cent in 2009 to 24.0 per cent in 2019.

**Figure 2: Proportion of youth outside labour force by residence and sex**



Source: KNBS (2009; 2019), Kenya Population and Housing Census

## **2.2 Policy Framework**

Kenya has taken various measures and policy choices to engage the youth in resolving the challenges they face and enhancing their active participation in nation building. The government has committed to various international, regional and national statutes to enhance youth welfare and address issues affecting their productivity. These include World Programme of Action for Youth to the year 2000 and beyond (WPAY), Lisbon Declaration 2007, Commonwealth Plan of Action for Youth Development, International Conference on Population and Development (ICPD) and the UN Youth Strategy (2030). Regionally, Kenya also champions youth empowerment by harnessing demographic dividend in Africa from its youthful population (2017 AU Theme), Africa Youth Charter (2006), the Dakar Declaration on Youth Empowerment, 2000 and the East African Youth Policy, 2013. These charters act as political, social, and economic frameworks for action to benefit from the youth who can drive the economic transformation of member countries of the AU.

At the national level, the commitment to youth empowerment is preserved in the Kenya Constitution Articles 55, National Youth Council Act of 2009, National Youth Policy 2007 and 2019, and Kenya Vision 2030 and its Medium-Term Plans. Other policy and legal documents include Technical and Vocational Education and Training Act of 2013, Uwezo Fund (in the PFM Act 2014), National Government Affirmative Action Fund (in the PFM Act, 2012), National Employment Authority Act, 2016, Kenya National Population Policy for Sustainable Development and Kenya's Demographic Roadmap 2020. These, among other provisions, prescribe that the government takes measures to develop affirmative action programmes, improve access to health, education and training for youth, social and economic representation, protection from harmful cultural practices and address under-employment.

The study reviewed select policies related to the youth in the themes of welfare, education, access to opportunities and employment. The review identified the scope of the policies, the challenge in implementation, gaps, and opportunities available for the benefit of the youth. The policy review shows that while there are robust policies involving the youth, including those targeting the demographic dividend, there are major gaps that need to be addressed, including gaps in monitoring and evaluation mechanisms for youth initiatives and low awareness and participation of the youth in formulating and implementing their interventions.

**Table 2: Policy framework for youth in Kenya**

<b>Policy</b>	<b>Aim/Focus</b>	<b>Achievements</b>	<b>Gaps/Challenges</b>	<b>Opportunities</b>
2030 Agenda for Sustainable Development	Prosperity for all people in the world through 17 Sustainable Development Goals.  Notably, specific goals target the thematic areas for the demographic dividend; goal 1 – no poverty, goal 3 – good health and well-being, goal 4 – quality education, goal 5 – gender equality, goal 8 – decent work and economic growth, goal 9 – industry, innovation and infrastructure, goal 16 – peace, justice and strong institutions, and goal 17 – partnerships for the goals.	The goals have been contextualized and operationalized by UN member countries, creating institutions and frameworks for implementation, monitoring and evaluation.  Increased innovation and industrialization in developing countries.  Uptake of Science, Technology, Engineering and Mathematics courses.  Increased access to basic services such as water, electricity and health services.	Timely data collection challenges for all indicators and targets in some countries limits tracking progress of achievements in SDGs.  Disaggregated development between developed and developing countries in areas of technology, infrastructure, healthcare, economic growth and social protection.	Benchmarking in comparator countries such as South Korea, Thailand and Singapore on key sectors especially human capital.  Increase in innovation across the globe for technology, knowledge and the digital space.



Policy	Aim/Focus	Achievements	Gaps/Challenges	Opportunities
African Union Demographic Dividend Roadmap 2017	Aims to guide and facilitate implementation of the AU theme on harnessing demographic dividends by investing in the youth in the AU member states. Sets out pillars for key investments: employment and entrepreneurship; education and skills development; health and well-being.	Rwanda has halved child mortality rates, increased investments in health and uptake of modern contraceptives to reduce fertility rate.	While fertility rates are on the decline in most African countries, they are still higher than required for a demographic dividend; the number of children under 15 years is higher than the youth, for instance, in Kenya. Potential risk exists where without enough jobs to absorb the youth, social unrest and instability may occur, and the youth bulge turns into a 'ticking time bomb'	Provides African countries an opportunity to grow rapidly from their young population. Increased access to education for African youth leading to a stronger human capital stock. Reduced inequalities in gender with increased female participation in the labour force and improved reproductive health. Improved infant mortality rates due to better reproductive health facilities and policies. Opportunity for governments to express strong political will for cooperation in achieving the demographic dividend.
Kenya Vision 2030	To transform Kenya into a middle-income economy, newly industrializing and providing high quality of life to its citizens by 2030	The social pillar addresses issues of the youth in education and training and gender through which reforms in education, increasing uptake in ICT were established. Implementation of the Uwezo Fund, Public Procurement and Disposal Regulations (AGPO) to involve the youth in accessing government procurement projects.	Impediment of politicization of the Vision objectives, for instance, youth programmes involving funding.	Building a globally competitive citizenry through training, quality education and skills development, including for the youth. Enhanced use of ICT for competitiveness, innovation, creativity and access to information. Revitalizing the healthcare sector to increase access to quality care by Kenyan citizens. Improved access to credit and social protection for youth and marginalized groups.

Policy	Aim/Focus	Achievements	Gaps/Challenges	Opportunities
Kenya Demographic Dividend Roadmap 2020-2030	To enhance the efforts of Kenya to harness the youth potential to achieve global competitiveness and prosperity for the nation of Kenya and its citizens.	Operationalized the African Demographic Dividend Roadmap in the Kenyan context in pursuit of AU Agenda 2063 and Vision 2030. A demographic dividend effort index report was developed in 2021 tracking the progress of Kenya in achieving the demographic dividend.	The COVID-19 pandemic slowed down the efforts towards women empowerment, achievements in the health sector and economic growth.	Improvements in health and well-being for adolescents and youth inclusive of access to reproductive health, generation of health data from county and national levels. Education and skills to ensure quality and relevant education to the labour market for national development. Increased employment opportunities and entrepreneurship to foster self-employment and reduce both unemployment and underemployment. Inclusivity of the youth in governance and democratic processes, representation and reduced sociopolitical inequalities.
National Employment Management Authority Act 2016	Provide an institutional framework for management of employment; promote enhancing interventions on employment; enhance access of employment for the youth, minority groups.	The authority facilitates placement for internships for youth in tertiary levels of schooling and recent graduates.	Inadequate awareness on the opportunities for youth available with the internship's placement function of the Authority.	If implemented fully, may facilitate the placement of many graduates and students in positions for training and skills growth. The records kept by the Authority on student internships and employment of youth after college can be used in creating a training and skills inventory for Kenya.

Policy	Aim/Focus	Achievements	Gaps/Challenges	Opportunities
Access to Government Procurement Opportunities Act 2013	Implements legal requirement for youth, women and special groups access to 30% of government procurement activities.  54% - youth 41% - women 5% - PWDs	Inclusive affirmative action for special groups. Increase in earning for youth, women and PWD-owned participant enterprises.  Creation of jobs at 70% by 2016. 82% increase in number of youth-owned enterprises.	Has not taken root in rural areas. Has a complex bidding process. Does not meet regional balance representation. Conflict of interest in cases where public officials participate. Inadequate accountability and transparency measures in tendering process. Minimal participation by PWDs. Delayed payment to firms leads to debt trap and financial strain. As of 2016, only 7.7% tenders were awarded to special groups. Majorly focused on construction while most firms are in services.	Establishment of an independent oversight authority to ensure compliance. Proactive ease of access and interpretation of procedures and requirements to improve access and participation. Has the potential to increase youth, female and PWDs' participation in economic growth. May increase innovation in the economy.

Policy	Aim/Focus	Achievements	Gaps/Challenges	Opportunities
National Curriculum Policy of 2018	Reforming the education system and curriculum in all levels of education and training.  Current position: pilot cohort transition to junior high school for Grade 6.	Successful pilot phase and kick-off. Implementation from Grade 1 to 5, for approx. 1,268,830 students not including those transitioning to Form 1 under 8-4-4.  Partial training of Trainers of Teachers and 60,000 teachers themselves for capacity building.  Development and dissemination of curriculum and syllabus materials.	Inadequate physical infrastructure.  Low number of trained educators compared to large student numbers.  High cost and inadequate availability of learning and teaching materials.  Inadequate cooperation especially from parents.  Inadequate ICT skills and infrastructure.	Improved outcomes in STEM courses.  Skilled workforce tailored to contemporary job market needs.  Stronger value system in the younger and upcoming generations.  An education system that is inclusive – access for marginalized and minority groups.
Kenya Youth Development Policy 2019	Empowering the youth for active and valuable contribution to national development.  Addressing emerging issues affecting the youth.  Aligns youth programmes to national and international development plans.  Holistic – goes beyond employment (Best practices from Sweden and Denmark)	Establishes a KYDI to track and measure youth-derived impact.  Supports subsequent establishment of a Youth Volunteerism Policy Framework.  Has an M&E plan for monitoring progress of youth programmes.  Dynamic in recognizing youth profiles categorically: male and female, PWDs, NEET.	Inadequate sensitization of the youth on the opportunities available to them under this policy.	Youth index a good measure for progress in youth.  Comprehensive M&E if implemented informs future policy.

### **3. Literature Review**

This section discusses the perspectives of the demographic dividend, and the theoretical and empirical literature underpinning the study objective. There are two major theories discussed in relation to the study: demographic dividend hypothesis and the human capital theory.

#### **3.1 Perspectives of the Demographic Dividend**

There are three major perspectives exploring the relationship between demographic dividend and its effect on economic growth: optimistic, neutralist and pessimistic perspectives as discussed in length by (Bloom, Canning and Sevilla, 2003).

The pessimistic perspective, drawing inspiration from the works of Thomas Malthus, was built on the backbone of the aftermath of the world wars that saw a rapid population increase due to reduced mortality rates and high fertility rates. As such, conservationists expressed that the rapid growth was going to serve as a brake on economic development. They further raised concerns that the huge population was a threat to food security and scarce natural resources, which in turn motivated developed countries to implement family planning programmes in many parts of the developing world.

Empirical evidence in the 1980s was, however, used to disprove the pessimistic perspective as technological advancements increased and countries focused on human capital accumulation for economic transformation. The optimistic perspective was supported by evidence that despite huge population increase, the prediction by the pessimists that millions would starve did not hold. Instead, progress in technology, agriculture and industry and innovation in social and institutional spheres was more rapid than any other period in history. A lot changed in how people lived, worked, participated in political processes, health and education standards, which supported the notion by optimists that population growth was an economic asset. Arguments arose that as population increases, human ingenuity also grows; that is, societies with large populations were well positioned to develop, exploit and disseminate knowledge, which has become a very vital asset in this period.

The neutralist view came up in response to the optimistic view of factors affecting the consequences of population growth either positively or negatively. They stated that when other control factors are accounted for, there is little evidence across countries to support the claim that population growth impedes or accelerates a country's economic growth. For instance, the belief that countries with large populations are slow in economic growth can be negated or reversed when one

accounts for literacy levels, openness to trade, quality of institutions of governance and the size of the country. The neutralist view disproved the pessimistic view that exhaustion of natural resources was strongly affected by population increase, arguing that conservation, technological advancements and efficient allocation of resources play a bigger role than population. In essence, neutralists argue that in the grand scheme of the policy environment for economic growth, population issues play a minor role.

## **3.2 Theoretical Literature**

### **3.2.1 Demographic Dividend Hypothesis**

This hypothesis explains the phenomenon of countries taking advantage of a window of opportunity where the working age group is more than the dependent population for economic growth and development. This opportunity is presented in the demographic cycle where a country experiences low fertility and mortality rates that lead to a natural decrease in the dependency ratio. This low dependency then gives room for the workforce to improve or transform the economic prosperity of that country. In this period, the population below 15 years and over 64 years reduces to less than 30 per cent and 15 per cent, respectively, leaving the working age population as the larger share of population.

There are two major assumptions of this hypothesis: that the 15-to-64-year age group leading to economic transformation are that they are likely to be working, earning, investing and saving due to fewer dependents. Secondly, women are assumed to participate in the labour force and obtain education and skills since they are not preoccupied with many dependents and chores. The working group are also likely to invest in personal needs and the well-being and education of their children, leading to long life expectancy and shifts people's perception on retirement, education, the family unit and the role of women. They can devote time and resources to their kids with their focus being quality of the child and not the quantity. These educational and health-related investments pay off greatly by producing a healthy workforce that is productive, earns higher wages and lifts the standards of living, eventually transforming the economy (Jafrin and Masud, 2020).

### **3.2.2 Human capital theory**

The increasing complexities of the world we live in have necessitated the need to place human capital at the centre of the development process to solve new and increasingly complex problems. Human capital is defined as a productive

wealth encompassed in the labour, skills, stock of knowledge and health that allows individuals to contribute to economic productivity. Skills and knowledge are acquired through education, on-the-job training and work experience. This theory considers five dimensions of focus when investing in the human capital of a country: schooling, adult education, health, migration and on-the-job training.

The two major views of human capital theory on the returns on investment are narrow and wider views. The narrow view posits that the levels of income increase parallel to higher skill and knowledge levels, meaning that higher returns are to be expected compared to the cost invested in training. The wider view asserts that the process of training and learning influences life beyond what is reflected in labour income and market earnings. The economic perspective is not the only point of focus, but also extends to include demographic and sociological aspects to regard human capital as a key element in the socio-economic development of a country. For instance, the 19<sup>th</sup> century period of modernization in Europe was a combination of both technological advancement and fertility transition (Jafrin and Masud, 2020).

### **3.3 Empirical Literature**

Bloom, Canning and Sevilla (2003) and (Bloom et al., 2010) describe the five main assumptions upon which the demographic dividend proposition is based. First, a rise in share of working-age expands a labour force that produces more than it consumes. Second, reducing fertility rate encourages female participation in labor market and reduces the dependency ratio. Thirdly, investments are channeled towards education, health, and skills of the population as lower resources are required to be directed for childcare and rearing. Fourthly, savings and capital accumulation increase because of increased working- age group who can save rather than spend on dependents. Lastly, it follows the assumptions of the 'life-cycle theory' which holds that as people's life expectancy increases, they save more for their retirement.

Bloom, Canning and Sevilla (2003 ) further emphasizes the impact of the policy environment on whether a country achieves a demographic dividend or not. Of utmost importance are policy investments in public health, which they described as being 'at the heart of the demographic transition'. These health policies should address such issues as proper sanitation, acceleration of immunization programmes, contraceptives initiatives and good health infrastructure. The significance of these health policy investments is their positive effect on poverty alleviation and improved economic growth. Having a large and youthful work force

may not translate to increased productivity and savings if they are unhealthy, have a disease burden and spend a lot on healthcare expenditure.

Secondly, the authors advocate for stronger policies in labour, financial markets and human capital to capitalize on a country's large workforce. These include efforts to make an economy more open, flexibility of the labour force and modern institutions that make labour more competitive in a global scale. An open economy allows for access to international markets while flexible labour markets can accommodate the large number of working populations and allows workers to shift from one area to another. Sound macroeconomic policies should be in place to encourage private savings and ensure their proper allocation in investment by the government as has happened in East Asian countries. Scarcity of credit leaves the poor out of the development plan, necessitating policy interventions that microfinancing by both the state and private actors. These have targeted low-income households by providing low-interest and collateral-free loans in successful case studies such as Bangladesh, where there have been improved outcomes in income from entrepreneurship and socio-economic developments in sanitation, education and housing.

Cilliers (2021) assessed the relationship between a demographic dividend and economic growth with a focus on Africa. The fact that Africa's abundance of youthful population did not translate to increase in income and GDP per capita led to the conclusion that these two are a result of contribution from a combination of production factors: labour, technology and capital. In 2017, the African Union had its annual theme as "Harnessing the Demographic Dividend through Investments in Youth". In this spirit, the AU Commission reviewed the progress made with the African Youth Charter of 2006 that outlined a plan of action aimed at realizing the potential of the young population in the continent. The author, however, noted that with the right policy environment, Africa has the opportunity to accelerate population-driven growth through interventions in education, human capital, infrastructure and of utmost importance, empowerment of women (Cilliers, 2021).

Chandrasekhar, Ghosh and Roychowdhury (2006) assessed why India has yet to achieve a demographic dividend despite reduced fertility rates and dependency ratio and a youth bulge joining the workforce. Their findings indicated low absorption of the abundant youth entering the job market. Their employability was attributed to glaring gaps in health status, education and low female participation in education and the labour force. Gains from increase in self-employment of up to 48 per cent were negated by sharp decline in wage employment rate for the youth (Bohini, Yaganti and Thomas, 2022) sought to explain the conundrum of why gross domestic savings in India plummeted, despite having a record high 66 per cent working age population in 2018. With a focus on the millennial sub-



group, the results concurred showing that the savings dropped due to a decline in employment rates, identifying a skills development gap and low female participation in the labour force.

Karra, Canning and Wilde (2017) assessed reduction in fertility rates as a precursor to prime conditions for economic growth with a focus on the African continent. In essence, decline in fertility has major reverberating effects that could lead to economic growth. By reducing the dependency burden on the working age, investments in education, health and savings contribute to strong human capital and economic growth. Reduced fertility rates induce increased female labour force participation due to less dependents, good education and healthcare to ensure their welfare. Their simulation of the Nigerian case study showed that reduced fertility rates do indeed have a positive impact on economic growth in the short, medium and long term especially in female education and employment in the modern sectors.

Goldin (2019) asserted that the youth are the most entrepreneurial, which if properly harnessed translates to innovative production and increased income and savings, which in turn boost economic growth at the micro and macro levels. The 2016 MSME survey (KNBS, 2016) indicated that owners started their businesses for different reasons: 23.8 per cent of unlicensed enterprises due to having no other alternative, 23.5 per cent cited better income, and 4.7 per cent cited availability of capital. Financial inclusion for the youth is important, particularly with regard to access to credit to spur entrepreneurship, self-employment and innovation for economic growth.

Renteria, Souto, Mejia-Guevara and Patxot (2016) using the National Transfer Accounts methodology assessed the impact of education and age on the demographic dividends in Mexico and Spain. The study established that the impact of education was higher than that of age in both countries. Lutz et al. (2019) asserted that education plays a more significant role in driving and facilitating a country's demographic dividend compared to age structure using simulations for Nigeria and South Korea. The studies found that educating women played a key role in reducing fertility rates, consequently increasing the share of working age population. The dividend could be expanded by focusing policies on a life-cycle approach to education to overcome the potential negative impact of an aging population (Cuaresma, Lutz and Sanderson, 2014) further stated that education increases the uptake of new technologies and contributes directly into higher productivity, which boosts economic growth. Developing countries at the first stages of demographic dividend can extend the demographic dividend from the start.

Ogundari and Awokuse (2018) used the Solow Neo-classical Growth model to examine the relationship between economic growth and human capital in Sub-Saharan Africa using panel data for 35 countries over a period of 28 years. The specific variables they investigated were the comparative effects of health and education to human capital. The authors contended that most empirical studies focused on the role of education to human capital and found that all countries in the study spent more on education compared to health sectors. The study found that the contribution of health, proxied as life expectancy, to the human capital was significantly higher than that of education, proxied as the average years of schooling. This study contributes to the empirical literature that assesses how developing economies can enhance the potential of their human capital, concluding that they should invest in both health and education.

Sultana, Dey and Tareque (2022) further emphasized the importance of health in the quality of human capital using a System Generalized Methods of Moments for the 1980 to 2008 period. The study was carried out using panel data from 141 states, 93 developing countries and 48 developed countries to explore the impact of human capital on economic growth at different stages of development. The study established that all dimensions of human capital have a positive influence on economic growth in developing countries, and placed particularly emphasis on increased life expectancy. The opposite was, however, found for developed countries where increased life expectancy connoted a slowed economic growth owing to an increase in the dependency ratio brought about by an aging population. The study recommended that developing countries need to focus on the qualitative dimensions of human capital, especially the education and health dimensions, to sustain economic growth.

Phang (2005) assessed the demographic dividend and labour transformation in one of the most referenced success stories of South Korea. He observed that the demographic transition in South Korea was extremely rapid, and that in the coming years, in the absence of proper policy intervention, it will turn into one of the oldest populations in the 21st century. The author highlighted the fertility patterns of Korea; it increased by a 2.5 factor from 19 million in 1950 to 47 million in 2000, over a period of 50 years. This rapid transition occurred concurrently with rapid economic transformation and development of Korea's socio-economic system from an agrarian and rural society to an urban and industrialized one. The consistent decline in fertility from the peak 3.1 per cent in 1960 to 1.0 per cent in the 1980s could be attributed to outcomes as a result of socio-economic changes at the macro level manifested at the household level through consumption and expenditure choices. The author, however, cautions about the negative effect that choices such as delayed marriage in the current young population on future fertility

levels can negatively affect future dividends. This serves as a cautionary tale to countries entering the period of demographic transformation such as Kenya.

### **3.4 Summary of Literature Review**

The two theories discussed for this study, the Demographic Dividend Hypothesis and the Human Capital Theory are crucial in answering the question of how Kenya can achieve a demographic dividend through its youth. The demographic dividend hypothesis further emphasizes the importance of education and health of a large youthful workforce, while also placing emphasis on the policy environment of a country and the importance of female participation in the labour force. The empirical literature shows the factors that contribute to a dividend, notably education, good health, employment and savings, all of which build a strong human capital stock. Majority of the empirical studies focused on why developing countries have a young population but are yet to achieve demographic dividends as has occurred in developed countries such as South Korea. The various studies focus on the entirety of the labour force, which is inclusive of the youth. They use variables ranging from education, health, fertility ratio, savings and credit, age structure, and human capital dimensions including skills building and technological innovation. These dimensions can be enhanced in Kenya to improve the productivity of the youth, who form 53 per cent of the workforce, in pursuit of demographic dividends. This study seeks to contribute to the body of literature discussing the contribution of youth to the demographic dividend through productivity, as most literature addresses the working age labour force.

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## 4. Methodology

This section discusses the theoretical framework underpinning the study, the model specification, variables analyzed and their measurement, data sources and the descriptive statistics.

### 4.1 Theoretical Framework

The theory underpinning this study is the human capital theory, whereby an individual's productive capacity increases because of the investments in their abilities or skills. Following (Becker, 1962) and Rosen (1976) who are the initial proponents of the theory, they assumed that individuals could enhance their productivity by investing in education, training, and health, hence enhancing their earnings. The study assumes that youth productivity, proxied for the demographic dividend, can be enhanced through acquiring on-job training, higher educational levels, and health. Therefore, productivity of the youth can be improved by making investments in human capital. The human capital function for productivity of a youth used in this study is presented in this format:

$$P_y = f(E, T, H,) \quad (4.1)$$

On the left-hand side of 4.1 is  $P_y$ , youth productivity, which is the proxy for demographic dividend and on the right-hand side is its determinants.  $E$  is the education level attained,  $T$  is on-the-job training and  $H$  is the health of the youth. Sex is a very critical variable in the context of Kenya as argued by Karra, Canning and Wilde (2017) and Bohini, Yaganti and Thomas (2022), who contend that boosting female participation in labour force has contributed positively to enhancing labour productivity both at household and national levels in various countries.

Some other key variables which are critical to realize demographic dividend in the Kenyan context according to reviewed literature are access to information communication technology, sectors of employment, and household size. The choice of the variables is informed by their observability in the survey dataset used.

Given the influence of factors mentioned above, sex is incorporated into this study, and the equation 4.1 can be specified as 4.2:

$$P_y = f(E, T, H, sex, ICT, SES, region, HS) \quad (4.2)$$

To estimate a semi-logarithmic equation for the determinants of youth productivity, specified as follows in 4.3:

$$\ln(P_{yi}) = \beta_0 + \beta_1 E_i + \beta_2 H_i + \beta_3 T_i + \beta_4 \text{sex}_i + \beta_5 \text{ict}_i + \beta_6 \text{ses}_i + \beta_7 \text{region}_i + \beta_8 \text{HS}_i + \varepsilon \quad (4.3)$$

Where  $\ln(P_{yi})$  = log of income (proxy of youth productivity),  $E$  is the education levels attained,  $H$  is health,  $T$  is on-job training,  $G$  is gender,  $ICT$  is access to information communication technology,  $SES$  is the sector of employment, region is the area of residence (rural/urban), and  $HS$  is household size.

To estimate a sub-sample of 4.3, a linear regression equation for youth male only, which is estimated by their region.

$$p_{mi} = \beta_0 + \beta_1 E_i + \beta_2 H_i + \beta_3 T_i + \beta_5 \text{ict}_i + \beta_6 \text{ses}_i + \beta_8 \text{HS}_i + \varepsilon \quad (4.4)$$

Furthermore, to estimate another sub-sample, equation 4.3 for female only sample equation is specified by their region.

$$p_{fi} = \beta_0 + \beta_1 E_i + \beta_2 H_i + \beta_3 T_i + \beta_5 \text{ict}_i + \beta_6 \text{ses}_i + \beta_8 \text{HS}_i + \varepsilon \quad (4.5)$$

Where  $P_{yi}$ ,  $p_{mi}$ ,  $p_{fi}$  = is the youth productivity, youth male productivity and youth female productivity, respectively, proxied by income,  $E$  is the education levels attained,  $H$  is the health,  $T$  is on-job-training,  $\text{sex}$  is (male/female),  $\text{ses}$  is the sector of employment (agricultural or non-agricultural sector), region (rural/urban) and  $HS$  is household size and  $\varepsilon$  is the error term.

## 4.2 Data and Data Sources

The study uses data from the 2015/16 Kenya Household Integrated Budget Survey to conduct empirical analysis. The data is cross-sectional in nature as it was collected for 12 months from September 2015 to August 2016 for all 47 counties in Kenya. The survey covered a range of topics, Specifically the data was obtained from the dataset sections on household information, household members information, household consumption aggregate and household agriculture holdings. The unit of analysis was youth headed households. The study targeted the households headed by youth aged between 15 and 34, from which a sample size of 7,043 observations was identified. This was motivated by the Kenya's Demographic Dividend Road Map 2020-2030, which cites the youth as the engine to realization of demographic dividend that will accelerate the achievement of the Kenya Vision 2030 in Kenya, therefore answering the objective of the study. A description of both dependent and independent variables and how they are measured are discussed in Table 3.

**Table 3: Definition of variables**

Variable	Definition
Income	Natural logarithm of aggregate monthly consumption
Education level	1 if an individual has no formal education, 0 otherwise, 1 has completed primary education, 0 otherwise 1 has completed secondary education, 0 otherwise, and 1 has completed tertiary education, 0 otherwise
Health	1 if an individual has health insurance cover ,0 if not
On-job training	1 if an individual has worked as apprentice, 0 if not
Information communication technology	1 if an individual has access to internet, 0 if not
Sector of employment	1 if an individual is working in agricultural sector, 0 if not
Gender(male/female)	1 if an individual is male,o if female
Region(rural/urban)	1 if an individual lives in rural,o if urban
Household size	The number of individuals in the household

*Source: Authors' computation, 2022*

To determine youth productivity, the main dependent variable of interest in this study is youth productivity (our definition of demographic dividend). To ascertain the robustness of our results, we use proxies of household income to represent youth productivity as documented in other existing literature on the same. The aggregate monthly consumption per household size was used to proxy income of the household. This is an indirect approach for measuring household income. The choice of this approach was informed by the availability of data in the KIHBS 2015/16. Furthermore, the study assumed that households are biased in revealing their total incomes, which could have been a better option in analyzing household income. However, the direct approach had a lot of missing observations from the dataset that was used for the analysis in this study. Therefore, the study opted to utilize the indirect approach by using the aggregate monthly consumption per household size to measure the per capita income of youth-headed households.

Education levels: Human capital theory argues that individuals who have higher education levels have a higher probability of being productive. Therefore, acquiring higher education levels increases the productivity of a youth. Educational level was measured as a categorical variable, with four dummies generated according to the

highest education level completed. Education levels were measured as dummies where, if an individual has no formal education, it was valued at 1 and if otherwise expressed as 0. If an individual has completed primary education, it was valued at 1 and 0 if otherwise. If an individual has completed secondary education, it was valued at 1 and 0 if otherwise. If an individual has completed tertiary education, it was valued at 1 and 0 otherwise.

Health is another key variable used in the study, according to human capital theory, which postulates that healthy individuals are more productive. Therefore, being healthy increases productivity of a youth to realize demographic dividend. Strauss and Thomas (1998) in their study found out that healthy workers are more productive and receive greater earnings, which boosts spending and savings. Health was measured as a categorical variable where if an individual was covered by any health insurance in last 12 months and took a value of 1 and 0 if not.

On-job training is another key variable postulated by human capital theory, which argues that individuals who have undertaken on-job training have contributed positively to productivity. Similarly, it has been discovered in the literature that investing in workers' skills through training increases their productivity (González, Pazó and Miles-Touya, 2016). Trainings undertaken by household heads were measured as categorical variable, where the responses take the value of 1 if the individual has worked (at least one hour) as an apprentice in the last 7 days, and 0 if not.

Information and communication technology was another key explanatory variable. From the literature reviewed, it was found that access to information and communication technology boosts the productivity of a person. Similarly, Biesebroeck (2003) found that there is a positive association between technology and growth in labour savings productivity. Information communication technology was measured as a categorical variable, where the responses take the value of 1 if an individual has access to Internet coverage and 0 if they do not.

Gender was used to distinguish between male-youth headed households and female -youth headed households. According to Kenya labour markets, female labour force participation is minimal compared to male counterparts because of family responsibilities and cultural matters. Similarly, Erosa, Fuster and Restuccia (2002) found that productivity of the household can be influenced by the gender of the household head. Women's decisions about having children can disrupt their labour market participation. As a result, gender differences in productivity, employment, and earnings arise. Gender was measured as a categorical variable, where if individual is male takes a value of 1 and 0 if female.

The sector of employment was another key variable for the study and an important determinant of youth productivity. Kenya's economy heavily depends on the agricultural sector compared to other sectors. However, the sector remains unattractive to the youth despite having more potential to enhance their productivity. The sector of employment was measured as a categorical variable, where an individual working in the agricultural sector takes the value of 1 and 0 if not.

Household size was another variable identified to proxy for the dependency ratio, an important feature in determining income and consumption. This is a critical variable in determining youth productivity, since having a large household size may contribute to having more consumers than producers (income-earners) in the household.

### 4.3 Descriptive Statistics Discussion

From the descriptive statistics in Table 4, the study sample size consisted of 7,043 individuals across all 47 counties in Kenya. The average monthly log income is Ksh 8.765. An average of 2 was observed in the education level, which implies that most of the youth have completed secondary education. 21 per cent of young people have been covered by health insurance. 70 per cent of households are headed by young males while 49 per cent are in rural areas. 40 per cent work in the agricultural sector, 35 per cent have access to the Internet, while the average number of dependents in a youth-headed household is 4.

**Table 4: Descriptive statistics**

Variable	Obs	Mean	Std. Dev.	Min	Max
Log Income	7,043	8.765	0.703	5.046	13.222
Education	7,043	1.521	0.891	0	3
Health	7,038	0.208	0.406	0	1
Training	7,035	0.005	0.067	0	1
ICT	7,040	0.355	0.478	0	1
Sector of employment	7,043	0.401	0.490	0	1
Household Size	7,043	3.296	1.902	1	15
Location (rural)	7,043	0.492	0.500	0	1
Gender (male)	7,043	0.696	0.460	0	1

*Source: Author's computation, 2022*



### Distribution of youth households by age and sex of household Head

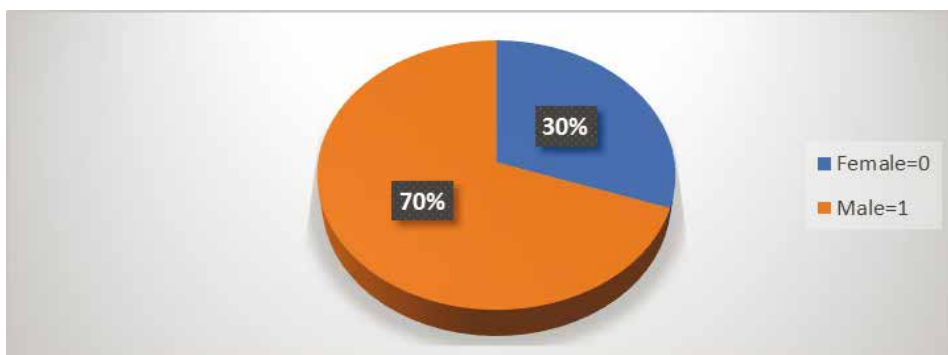
The study sample age ranged in age from 15 to 34, who are regarded as youth and part of labour force in Kenya. 42.78 per cent of households are headed by mature youth aged 30 to 34, while 2.39 per cent of households are headed by younger youth aged 15 to 19 (Table 5), out of which 30 per cent of the households were headed by females while 70 per cent were headed by male youth as indicated in Figure 3.

**Table 5: Distribution of youth-headed households by age of household head**

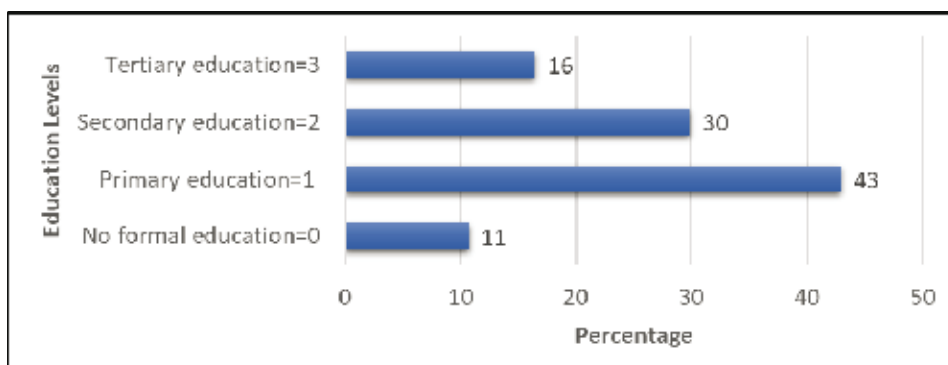
Age category	Percentage
15 to 19	2.39
20 to 24	18.15
25 to 29	36.69
30 to 34	42.78

*Data source: KNBS (2016), Kenya Household Integrated Budget Survey 2016*

**Figure 3: Distribution of youth by sex of household head**



*Data source: Kenya Household Integrated Budget Survey, (2016)*

**Figure 4: Distribution of youth household heads by level of education**

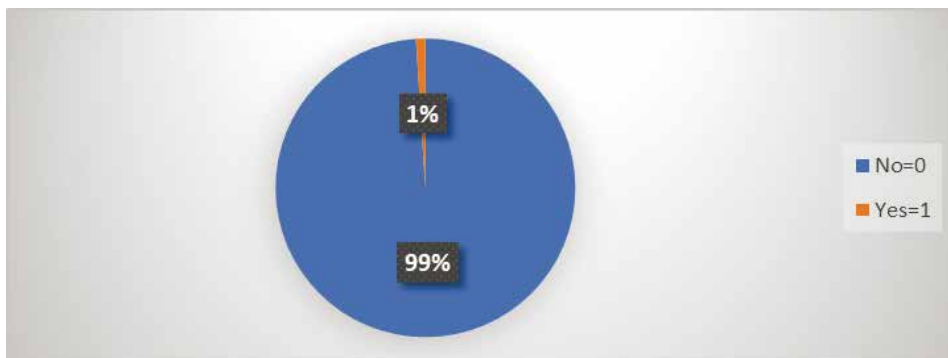
*Data source: KNBS (2016), Kenya Household Integrated Budget Survey 2016*

There were great disparities in levels of education among the youth. 10.72 per cent of the youth have no formal education, out of which 51 per cent were male youth and 49 per cent were female youth. 42.92 per cent of the youth have completed primary education, out of which 72.25 per cent were male and 27.75 were female. 29.98 per cent of the youth have completed secondary education, out of which 72.54 are males and 27.46 are females. In tertiary education, only 16.47 per cent of the youth completed in which 69.91 were male and 30.09 were female. This indicates that most of the youth have completed primary education, and transition to other levels of education has decreased by 26.45 per cent from 42.92 per cent to 16.47 per cent. Additionally, male youth have attained more levels of education compared to female youth.

### **On-job training**

99 per cent of youth have not undergone on-the-job training, while just 1 per cent have participated in it (Figure 5). This suggests that most young people lack the necessary skills to increase their productivity, as on-the-job training is the primary factor in developing youth skills and professional abilities in cognitive sectors.

**Figure 5: Distribution by on-job training**

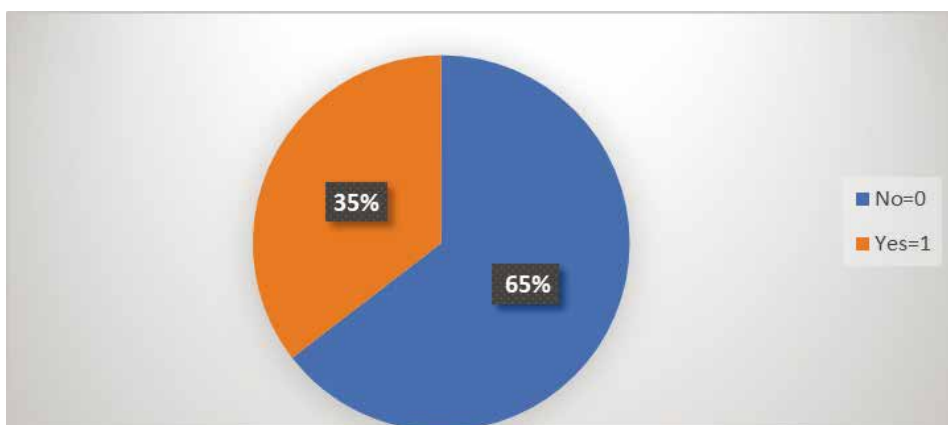


*Data source: Kenya Household Integrated Budget Survey, (2016)*

### **Distribution by access to ICT**

35 per cent of the youth households have access to Internet coverage while 65 per cent have no access to Internet coverage (Figure 6). These findings suggest that most of the youth have no access to technology infrastructure, which impedes their productivity levels. This may be contributed to the high cost of Internet access. Additionally, in the rural areas of Kenya, it's difficult to access the Internet as a result of low mobile connectivity.

**Figure 6: Distribution by access to ICT**

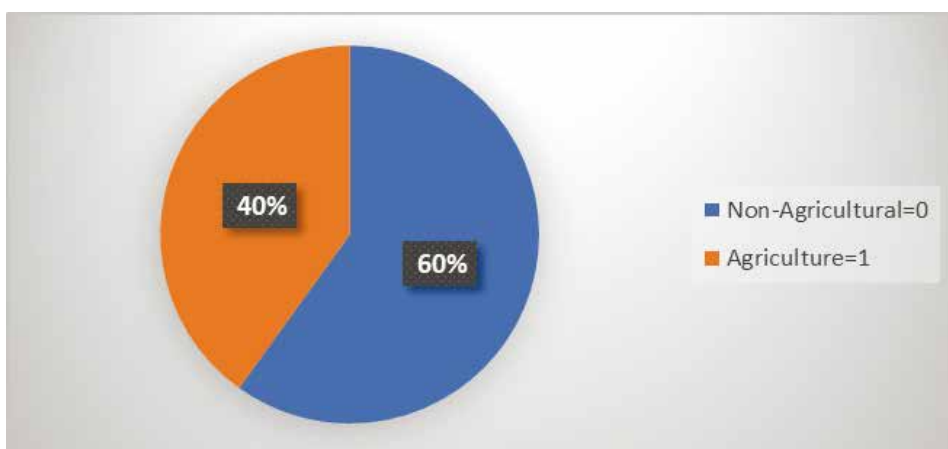


*Data source: KNBS (2016), Kenya Household Integrated Budget Survey*

### Distribution by sectors of employment

About 40 per cent of the youth are employed in the agricultural sector while 60 per cent are employed in non-agricultural sector (Figure 7). These findings reflect the transformational change in employment in the economy. A large share of youth is moving away from agriculture sector due to low returns obtained from agriculture in Kenya, and this has been attributed to subsistence farming and poor access to agricultural inputs such as land, fertilizer, and seeds by the youth. While the large share of youth in non-agricultural sector indicates the country is moving to high productivity sectors such as manufacturing and services sector, there is high chance for youth to reap demographic dividend from these sectors. However, investments in both agriculture and non-agriculture sector are critical for realization of demographic dividend.

**Figure 7: Distribution by sector of employment**

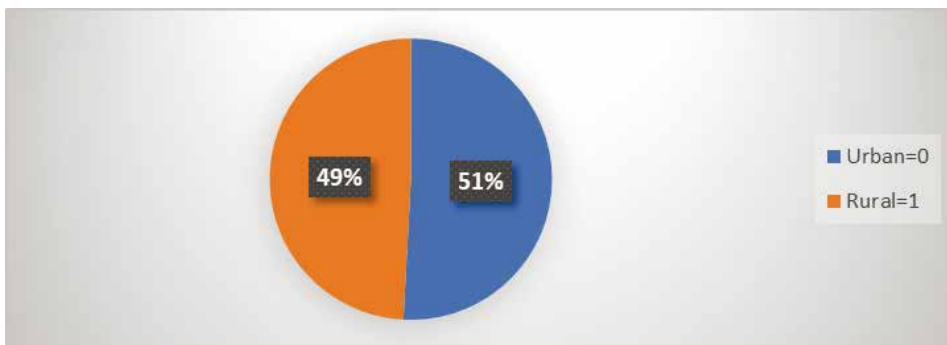


*Data source: KNBS (2016), Kenya Household Integrated Budget Survey 2016*

### Distribution by residence

The disparity between those living in rural areas and those in urban areas was rather small, with a slightly higher 51 per cent residing in urban areas while 49 per cent reside in rural areas (Figure 8).

**Figure 8: Distribution by residence (rural/urban)**



*Data source: KNBS (2016), Kenya Household Integrated Budget Survey 2016*

#### **4.4 Diagnostic Tests**

##### **Correlation matrix**

Appendix 4 reports the pairwise correlation between dependent and independent variables. The relationship between per capita income of youth is significant and positively related with education levels, health, information communication technology and on job training. Additionally, per capita is significant and negatively related with sector of employment, location (rural) and non-labour income. The correlation coefficients are below 0.5. Given these low correlations, we can conclude multicollinearity is not likely to bias the regression results.

##### **Variance inflation factor**

Appendix 5 reports that the residuals for estimated model followed normal distribution ( $p < .05$ ). The multicollinearity was not a major problem as the mean VIF was 1.84, which was less than VIF of 10 (Ferre, 2009). Furthermore, robust standard error was used to estimate the study model to control for heteroscedasticity.

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## **5. Results and Discussion**

The regression estimates for the household income are presented in Table 6, which reports estimation of results from equation 4.4, the full sample model, and sub-sample models 4.5 and 4.6 for urban and rural youth. All regressions are estimated using Ordinary Least Squares, with the full sample model explaining 46 per cent of the variations in household income, while the urban youth only model and rural youth model explain 39 per cent and 32 per cent variation in household income, respectively.

### **5.2 Empirical Results**

The study interprets the coefficient for estimated three equations. The significance of the results is determined at 5 per cent levels of statistical significance. Furthermore, the interpretation of the results is only done for determinants with significant effect on youth productivity.

#### **5.2.1 Education levels**

Education levels were found to be significant and positively related to household income in the full sample model. The increase in income varied based on the levels of education, where tertiary education showed the largest percentage increase. Youth who have completed primary education increase their income by 21.3 per cent, while the income of those with a completed secondary education increases by 29.2 per cent. A youth with a tertiary education increases their income by 55.9 per cent, considerably higher than those with primary and secondary education. The same result is reflected in the rural youth sample, whereby acquiring tertiary education increases household income by 46.5 per cent; the dividends for tertiary education are slightly higher in urban areas increasing income by 48.2 per cent, consistent with assertions by Yang (2017) who found that education returns are higher for urban dwellers than for rural dwellers. Secondary education also has a positive impact on household income, especially in rural areas where attainment of secondary school level increases income by 32.9 per cent, slightly higher than that of the full sample. Majority of the youth have primary and secondary school education at 43 per cent and 30 per cent, respectively (Figure 4). There is need to increase transition from one level to another and increase uptake in tertiary education in rural and urban areas.

### **5.2.2 Health**

Having a health insurance cover has a positive impact on the income of the household, shown in the results to increase income by 13.5 per cent. This is slightly more significant in rural areas at 17 per cent increase compared to 12.5 per cent increase in urban households. As a proxy for health access, this implies that health access in rural areas is an area for improvement since the health of a youth impacts their productivity. Urban areas such as cities and towns have better healthcare infrastructure and a higher number of medical personnel compared to rural areas. Additionally, 34.1 per cent of the youth work in the informal sector and are prone to under-employment and are likely not covered by health insurance. Kenya risks missing out on a demographic dividend from its youth as was in India where disease significantly reduced the employability of Indian youth (Chandrasekhar, Ghosh and Roychowdhury, 2006). The National Council for Population and Development - NCPD (2022) identified drug and substance abuse, HIV/AIDS, mental health and sexually transmitted diseases as the main health issues affecting the youth in Kenya. The health status of a country impacts the dividend by reducing fertility rates, in turn encouraging female labour force participation (Bohini, Yaganti and Thomas, 2022).

### **5.2.3 Sectors of employment**

Regarding the sector of employment, the income of youth in rural areas working in the agricultural sector increases by 11.3 per cent relative to a full sample of income by 6.6 per cent. The availability and access to land for agricultural production in rural areas may explain why the income is higher in rural areas than urban areas. NCPD (2022) further identifies the disconnect between agricultural training and practice, lack of capital finance, limited use of innovative technologies and exclusion from policy making makes the sector unattractive to the youth. The challenges of climate change, limited access to credit and land scarcity, along with a perception that agriculture is not profitable has led the youth to prefer employment in other sectors (Samuel Hall, 2017). Additionally, the potential for the ICT sector may extend beyond the sector itself to impact quality production of goods and services, including in agriculture for value addition, market information and inclusive economic growth in both urban and rural areas.

### **5.2.4 Information Communication Technology**

The full sample indicates a significant and positive effect of access to ICT and youth household income, showing that access increases income by 24.5 per cent.

Increase in income by ICT is higher in urban areas by 26 per cent compared to rural areas at 20.9 per cent, attributable to better connectivity and ICT infrastructure in urban areas compared to rural areas. The skills and knowledge required in utilizing ICT are more prevalent in urban areas where training and infrastructure are more available compared to access in rural areas. ICT enhances access to information on labour market-relevant information such as job opportunities and is an invaluable learning tool. It also provides employment for the youth in an increasingly globalized and digitized world and a thriving 'gig' digital economy. On this basis, investing in access to ICT and corresponding infrastructure would yield high dividends for both urban and rural youth in Kenya.

#### **5.2.5 Area of residence (urban/rural)**

Residing and working in an urban area is significant and positively related to income, with an increase of youth household income by 30.1 per cent. This may be explained by assertions by Bloom, Canning and Fink (2008), who reference urban areas such as cities as locations that have concentrated economic activity in close proximity to labour. Urban areas also offer opportunities for education, creativity, ICT infrastructure and connectivity, and incubation of new ideas, all of which contribute to highly qualified and diverse human capital. With 51 per cent of Kenyan youth residing in urban areas, investment in their human capital is needed, and improvements in rural areas to improve the productivity of youth residing and working there.

#### **5.2.6 Sex**

The sex of the youth household head is significant and positively related to household income, increasing income by 3.7 per cent in the pooled sample. The implication of this result is that boosting female participation in the labour force yields greater dividends for the youth and the country, as supported by empirical studies (Ciliers, 2021; Karra et al., 2017). Urban female participation was also positive and significant, increasing household income by 7.6 per cent, presumably due to the employment, training and education opportunities readily available in urban areas. The potential opportunities in the new education reforms give the opportunity for inclusive training and education for women and increase in STEM outcomes for higher productivity.



### 5.2.7 Household size

The size of the household as a proxy for the dependency ratio is positive and negatively related to household income. An additional member in the household negatively affects the household income by 12.4 per cent. This finding supports the demographic dividend hypothesis that requires a reduction in the dependency ratio to allow the working age to save, invest in education and health for greater human capital development. With a total dependency ratio of 75 per cent, the youth are not gaining as many dividends for the country as they could. They are also a majority in the active labour force, supporting a large children population and thus limiting the dividends gained from the youth (UNFPA, 2020).

**Table 6: Determinants of youth productivity**

	(1) Full sample	(2) Urban youth	(3) Rural Youth
Primary education	0.213*** (0.000)	0.077 (0.000)	0.234*** (0.000)
Secondary education	0.292*** (0.000)	0.153** (0.000)	0.329*** (0.000)
Tertiary education	0.559*** (0.000)	0.465*** (0.000)	0.482*** (0.000)
Health	0.135*** (0.000)	0.123*** (0.000)	0.170*** (0.000)
ICT	0.245*** (0.000)	0.269*** (0.000)	0.209*** (0.000)
Sector of employment	0.066*** (0.000)	-0.009 (0.671)	0.113*** (0.000)
Training	0.146 (0.072)	0.123 (0.165)	0.135 (0.559)
Household size	-0.124*** (0.000)	-0.125*** (0.000)	-0.125*** (0.000)
Female	0.047*** (0.000)	0.076*** (0.000)	-0.0128 (0.506)
Urban	0.301*** (19.76)		
Observations	7033	3576	3457
R <sup>2</sup>	0.461	0.388	0.319

\*\*\*, \*\*, \* denote significance at 1% level, 5% level and 10% level respectively.

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## 6. Conclusion and Recommendations

### 6.1 Conclusion

This paper sought to examine the determinants of youth productivity on achieving the demographic dividend in Kenya using the human capital theory. The study found the following:

- **Education levels:** Most of the youth have primary and secondary levels of education while higher dividends are obtained from having tertiary education.
- **Sector employment:** Sector of employment is a critical aspect in realization of the demographic dividend, with those employed in non-agricultural sector realizing higher dividends than their counterparts in the agricultural sector.
- **ICT Access:** Having access to the Internet is very critical in the realization of the demographic dividend, with those with access to ICT realizing higher dividends than those without access to ICT. Most of the youth living in rural areas do not have access to the Internet and ICT, while higher dividends are realized for those youth living in urban areas who have better access to ICT.
- **Health:** Health insurance coverage and access to healthcare is very low among youth, yet it is a critical aspect for realizing youth productivity hence demographic dividend. Youth living in rural areas have little access to health insurance coverage in comparison to their counterparts in urban areas. Therefore, investing in health insurance coverage for rural youth will lead to realization of higher dividends in both rural and urban youth.
- **Dependency ratio:** A high dependency ratio reduces the dividends, while most youth headed households have a large share of dependents. The higher dividends are realized when youth have a small share of dependents in their household, which can be achieved by reducing fertility rates among the youth.
- **Gender equality:** A significant share of female youth are not participating in the labour force while higher dividends are realized when female youth are also part of the labour force. Urban female youth have higher dividends compared to those in rural areas.
- **Rural development:** Youth living in rural areas have lower dividends than their counterparts in urban areas. However, investing in rural development will accelerate the realization of higher dividends among the youth living in rural areas.
- This study shows the significant effects of individual and household characteristics as predictors of youth productivity in achieving the demographic dividend in Kenya.

In conclusion, investing in youth education, health, improving youth productivity and employment in the agricultural sector, gender equality, access to ICT, reducing the dependency ratio will accelerate the realization of demographic dividend in Kenya.

## **6.2 Policy Recommendations**

Policies targeting the youth need to address the following key areas:

### *Education levels*

The government and the private sector may consider expanding tertiary education by having quality college education, technical vocational training education and university institutions among youth in rural areas, and target female youth. The government may also consider full enforcement of the 100 per cent transition rate from primary school to secondary school, especially in rural youth. This will ensure that they acquire formal education, training and skills that are needed in technical and industry-specific jobs later in their lives. There is also need to develop school to work transition frameworks at national and county levels to enable the youth transition successfully from school to the labour market. This will reduce youth unemployment and under-employment by reducing the skills gap that causes the mismatch between school and industry. A review of policy indicated that the youth are poised to benefit from the National Curriculum Policy through uptake in STEM courses and skills, inclusive education for marginalized groups, and education that prepares youth for the job market.

### *Sectors of employment*

There is need to encourage the youth to engage in both agricultural and non-agricultural sectors by promoting commercial agriculture, and forming marketing groups for their products to be sold, creation of value addition for manufacturing products. This can be done through introducing light manufacturing entities that enhance value addition for agricultural products and link them to big firms for ready market at the national, regional, and international levels. The government and development partners may also consider providing technologically driven incentives such as climate smart agriculture training and urban agriculture initiatives to encourage the youth to participate in agriculture and increase earnings from the sector. Since youth do not likely own land, the main resource in agricultural productivity, the government may consider land-leasing programmes

to lease the youth parcels of public land for farming and productivity to increase income and create jobs.

#### *Access to information communication technology*

Investments in technology and reliable infrastructure are critical in ensuring that the youth obtain access to labour and sector market information such as job opportunities, online courses to build their skills and investment opportunities. Easy access to information helps the youth learn how they can improve their productivity. Access to ICT can also help the youth participate in the gig economy, which is gaining traction in a highly evolving and globalized world involving working online and remotely, which allows them to earn income and encourages self-employment. The government through public-private partnerships with private ICT companies could consider using primary and secondary schools as their Internet hubs for easy access for all youth both in rural and urban areas. Increasing connectivity in rural areas of Kenya would also contribute to inclusive development by reaching marginalized communities and diversify job creation.

#### *Health insurance cover*

The percentage of youth with health insurance cover is rather low according to the KIHBS 2015/16 survey, pointing to an issue in affordability of health services for the youth. The government through the Ministry of Health and County government departments of health could consider waiving registration fees for the health insurance coverage to allow more youth to have access to NHIF coverage. The county government can roll out a sensitization programme in each ward to encourage youth to register with the NHIF scheme to allow them to afford health services, which consequently would improve their productivity and dividends.

#### *Dependency ratio*

There is need for the government through the ministry of health and devolved county units to provide sexual and reproductive health services to young people to reduce the rates of sexually transmitted diseases and HIV/AIDS. Enabling access to information on reproductive health, especially contraceptive use and availing quality services by the government would reduce the fertility rate and thus the dependency ratio.

### *Gender equality*

The results indicated that investment in female participation in economic activities would increase the income of the household. As such, there is need for the government, civil society and development partners to invest in the empowerment of women in areas of education, access to health, employment and investment opportunities. The AGPO initiative, for instance, prioritizes access to government procurement opportunities for youth and women. However, a review of its implementation showed that information and access to AGPO is concentrated in urban areas, requires capital not easily accessible for minority groups, and less than half of the beneficiaries have been women. The government may consider carrying out information campaigns through the county governments to inform the youth, especially women, on the opportunities available in government and the private sector for training, education and reproductive health.

### *Rural development*

The youth are majorly living in urban areas whose infrastructure is unable to hold the rapidly increasing population. This presents an opportunity for the government develop infrastructure in rural areas, especially in agriculture, physical infrastructure in transport and ICT. Doing so would create an enabling environment for productivity through innovation, employment and connectivity with the urban areas, which will increase youth productivity for demographic dividends.

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## **Appendices**

**Appendix Table 1: Variance inflation factor**

	<b>VIF</b>	<b>1/VIF</b>
Primary education	3.343	0.299
Secondary education	3.444	0.290
Tertiary education	3.231	0.310
Health	1.250	0.800
ICT	1.599	0.626
Sector of employment	1.382	0.724
Training	1.014	0.986
Household size	1.241	0.806
Female	1.037	0.964
urban	1.403	0.713
Mean VIF	1.894	.

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