

Analyzing the reasons why women are behind on the wave of technology and exploring strategies to bridge the digital gender gap.

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#### Abstract

The digital gap is a popular coinage which refers to inequality in the access and use of Information and Communication Technologies (ICT) across target populations (Fuchs and Horak, 2006; see also van Dijk, 2006a; Wilson, 2006; Castells, 2002, as cited by, Alozie, N.O. and Akpan-Obong, P., 2017) Within the continent of Africa, many countries face the issue of having a digital gender gap. This digital gender gap primarily stems from the pre-established socio-cultural beliefs regarding gender roles that are present in the majority African societies. This paper seeks to investigate some of the earlier technologies that were introduced in the continent of Africa, and the impacts of the established perspectives on gender roles and equity on its usage; additionally it will also explore the gender digital divide in Africa and some possible solutions to the issue.



#### Introduction

According to Alzouma (2005, p. 353, citing Hall, 1998), citing Morino Institute (2004), it was Larry Irving, an ex-member of President Clinton's administration who coined the term the 'digital divide' in the mid 1990s. (Wondwosen Teshome, B., & Mag Jerusalem Negash, W., 2007) However, Irving himself honestly admitted that the term was invented by two Los Angeles Times Journalists, Jonathan Webber and Amy Harmon, "to describe the Social division between those who were very involved in technology and those who were not." (Irving, 2001s, as cited by Wondwosen Teshome, B., & Mag Jerusalem Negash, W., 2007) According to the World Bank (2003), Information and Communication Technology(ICT) includes "hardware, software, networks, and media for collection, storage, processing transmission, and presentation of information in the form of voice, data, text, and images and they range from the telephone, radio and television to the Internet." (Wondwosen Teshome, B., & Mag Jerusalem Negash, W., 2007) After analyzing the literature on the digital divide, Fink and Kenny (2003) claimed that the term 'digital divide' has at least four interpretations: "a gap in access to use of ICTs; a gap in the ability to use ICTs; a gap in actual use; and a gap in the impact of use." (Wondwosen Teshome, B., & Mag Jerusalem Negash, W., 2007)

Empirical studies show that women trailing behind in the digital revolution slows economic growth and will undermine implementation of the UN agenda for sustainable development (Braunstein, Bouhia, & Seguino, 2020; Kerras, Sánchez-Navarro, López-Becerra, & de-Miguel Gómez, 2020; Matthew, Adeniji, Osabohien, Olawande, & Atolagbe), 2020, as cited by Wondwosen Teshome, B., & Mag Jerusalem Negash, W., 2007). It has also been shown that digital technologies (the Internet, mobile phones, digital platforms and digital financial services) provide 'leapfrog' opportunities and enhance women's empowerment (Evans, 2019; Musa, 2019; Parveen & Gouda, 2020, as cited by, Adeola, O., 2020). Bridging the gender divide will increase income, provide employment opportunities and give women in Sub Saharan African countries' access to education and the benefits can enhance the lives of the women and their families, and thus promote the well-being of society. (Adeola, O., 2020)



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# Earlier History Of ICTs In Africa



The years 1995 and 1996 could be called the Internet years for Africa because around 25 African countries got Internet connectivity. (Wondwosen Teshome, B., & Mag Jerusalem Negash, W., 2007) Prior to 1995, only Tunisia, Egypt, Zambia and South Africa were connected to the Internet. (Hussein and Bekele, n.d., as cited by, Wondwosen Teshome, B., & Mag Jerusalem Negash, W., 2007) (ibid) According to Chowdhury (1998), the first country in Sub-Saharan Africa to establish direct connection to the Internet was South Africa, but, by that time two North African countries, Tunisia and Egypt, already had direct connection with the Internet.(ibid) It is estimated that over 10 million people used the Internet in Africa back in 2007. (ibid) Though most of the Internet users in Africa used emails, the Web was still not used as a major source of information. (ibid) This is because firstly, most of the users were not efficient in Web searching techniques; secondly, the cost of Internet access and usage was high; and thirdly, broadband technology was very limited and hence, downloading online data was very slow. (ibid)

The conventional argument was that ICTs had the capacity to create universal empowerment through economic and employment opportunities such as e-commerce, e-education platforms and transparency accountability and efficient government transactions (Huyer and Sikoska, 2003), particularly for people in developing countries (Meng and Li, 2002). (ibid) However, evidence emerged that the rate of ICT diffusion in any society is dependent on the existence or level of primary technologies such as electricity, as well as cultural and institutional factors such as literacy rates and income levels (UNCTAD,2006). (ibid)

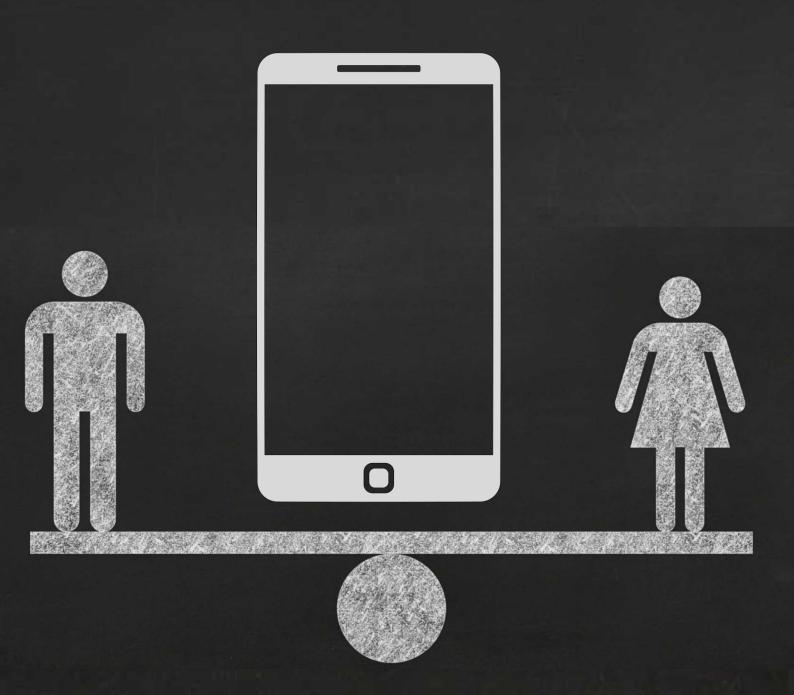
After analyzing about 15 Master's theses on information systems in Ethiopia, Kenya, Malawi, Sudan, Tanzania, Uganda and Zambia (Chowdhury and Taye, 1995) underscored the following points (ibid):

- In these African countries, public library systems were less developed except in educational institutions. Even in the libraries of the academic institutions, information technology and services were very inadequate. It is also revealed that the CD-ROM was the most accepted form of information service in those countries particularly, in the academic institutions and research libraries.
- In these countries, let alone the general public, even among the educated people, the rate of the usage of information technology was very slow. The aforesaid research showed the condition in those countries up to 1994, since the researchers investigated the post graduate theses between 1992 and 1994.

However, recent studies have shown slight positive changes since then. According to Internet World Stats, in the first quarter of 2020, Africa had an Internet penetration rate of 39.3 percent compared to the world average of 58.8 per cent (2020). (Adeola, O., 2020) Low Internet penetration on the continent has a correspondingly low usage by women. An increase in Internet access would increase overall usage and the participation of women in the digital age. (Adeola, O., 2020)



# Gender Equality In Relation To ICTs







Gender equality has been described as a fundamental human right (UN, n.d.); the keystone for a prosperous modern economy, sustainable and inclusive growth, and essential for ensuring that both men and women are prepared to contribute fully for the betterment of the larger society. (Adeola, O., 2020) Significant efforts have been invested in designing policy directives that drive gender equality on various fronts; for example, in the form of a reduction in the gender gap in sub-Saharan Africa (SSA) labor market participation rates. (ibid) Gender inequality is apparent in politics, education, employment, social involvement, economic development, and human dignity across the globe (Hennig, 2019). (ibid) It is also recognised as a major problem for development (Branisa, Klasen, Ziegler, Drechsler, & Jütting, 2014). (ibid) Increased awareness of this injustice has galvanized global leaders' efforts to support the adoption and implementation of policies that assure gender equality and empowerment of women. (ibid) Considering the wide array of challenges for women, available statistics show that overall, gender inequality remains at high levels in the continent of Africa, compared to other regions of the world. (ibid)

**Table 13.1** The gender gap in mobile ownership and mobile Internet usage for male and female in 2018

Region	Mobile owner.	ship (%)	Mobile Internet usage (%)	
	Rate of ownership	Gender gap	Rate of usage	Gender gap
South Asia	65	28	27	58
Sub-Saharan Africa	69	15	29	41
Middle East and North Africa	80	9	44	20
Europe and Central Asia	90	-2	60	4
East Asia and Pacific	93	1	64	4
Latin America and the Caribbean	86	1	66	2

Source: Rowntree & GSMA Contributors (2019)

In contemporary times, the gender gap has extended to the digital gender divide. According to official statistics in 2018, the digital gender divide is wide, not only in SSA, but across the world, including the Middle East and North Africa, Europe and Central Asia, East Asia and the Pacific, Latin America and the Caribbean, and South Asia. (ibid) Mobile ownership and Internet usage rates are shown in Table 13.1. The gender gap (that is, how much less likely it is for a female than a male to own a mobile phone and also use the Internet), is quantified in the table. (ibid) Despite the effectiveness of digital technologies to provide 'leapfrog' opportunities for women and thus enhance their economic and political empowerment, the digital gender divide persists in sub Saharan Africa (SSA). (ibid) Less-than-full participation of women in the digital revolution can slow down economic growth and undermine the implementation of the United Nations 2030 Sustainable Development Goals (SDGs). (ibid)



The digital gender divide is an expansive formulation that captures the myriad ways in which men and women differ in their relationships to ICTs (Fuchs and Horak, 2007; United Nations, 2005; Friedman, 2001). (Alozie, N.O. and Akpan-Obong, P., 2017) One aspect of that differential relationship pertains to the disparity in ICT access and use (first and second order digital divide- see Jin and Cheong, 2008) in many countries (iTU, 2010; Sciadas, 2005) that favor men. (ibid) The second extends deeper into facets of sociology of ICTs (Yuguchi, 2008; van Dijk, 2006a; Friedman, 2001), including the fact that ICT leadership and decision making, content and applications determination are issues controlled by men and squarely organized to concur with men's worldview (United Nations, 2005). (ibid) In patriarchal societies prevalent in Africa, where cultural norms often arbitrarily demarcate gendered spaces in more acute ways than occur in other societies, weaving men's dominance into ICTs can only exacerbate the digital gender divide, further leaving women behind. (ibid) Thus, even if women have access to and use the technologies, the ICT sociological argument is that women will largely remain 'Cinderellas', dwelling 'in the basement of knowledge society with little opportunity to reap its benefits' (Hafkin and Huyer, 2006). (ibid)

# Gender Digital Divide

The digital gender divide refers to gender differences in resources and capabilities, to effectively access and utilize ICT within and between socioeconomic groups, sectors, countries and regions. (Adeola, O., 2020) In SSA, a number of hurdles to access contribute to the digital gender divide: non-affordability, inadequate education, lack of technological literacy, inherent biases and socio-cultural norms that encourage genderbased digital exclusion. (ibid) Intel and Dalberg (2012) asserted that affordability prevents users from using the Internet, a reality that disproportionately affects more women and girls than men, in Africa. (ibid) Enhanced and more affordable access to digital tools and services is thus crucial, in addition to policy interventions that address structural biases.(ibid) Similarly, women are significantly more likely than men to be indifferent to Internet usage (Fallows, 2005). (ibid) Intel and Dalberg (2012) found that in developing countries, 25 percent of women are not interested in using the Internet; this indifference may be traced to illiteracy. (ibid) According to the UNESCO Institute of Statistics, in 2018, 59 percent of adult females (aged 15 years and above) were literate, compared to 73 percent of adult males in SSA, indicating a wide gender gap (World Bank, 2018). (ibid) This gap could extend to digital illiteracy, or worse, technophobia, which often appears in girls in formal education because they are less confident in the use of ICT (OECD, 2018). (ibid) Socio-cultural factors play an important role in explaining the digital gender divide in SSA. As one study aptly describes it: "Active female Internet users are three times more likely to have families who are 'very supportive' of their Internet use, whereas female nonusers are six times more likely to be exposed to family opposition" (OECD, 2018, p. 23) (ibid)

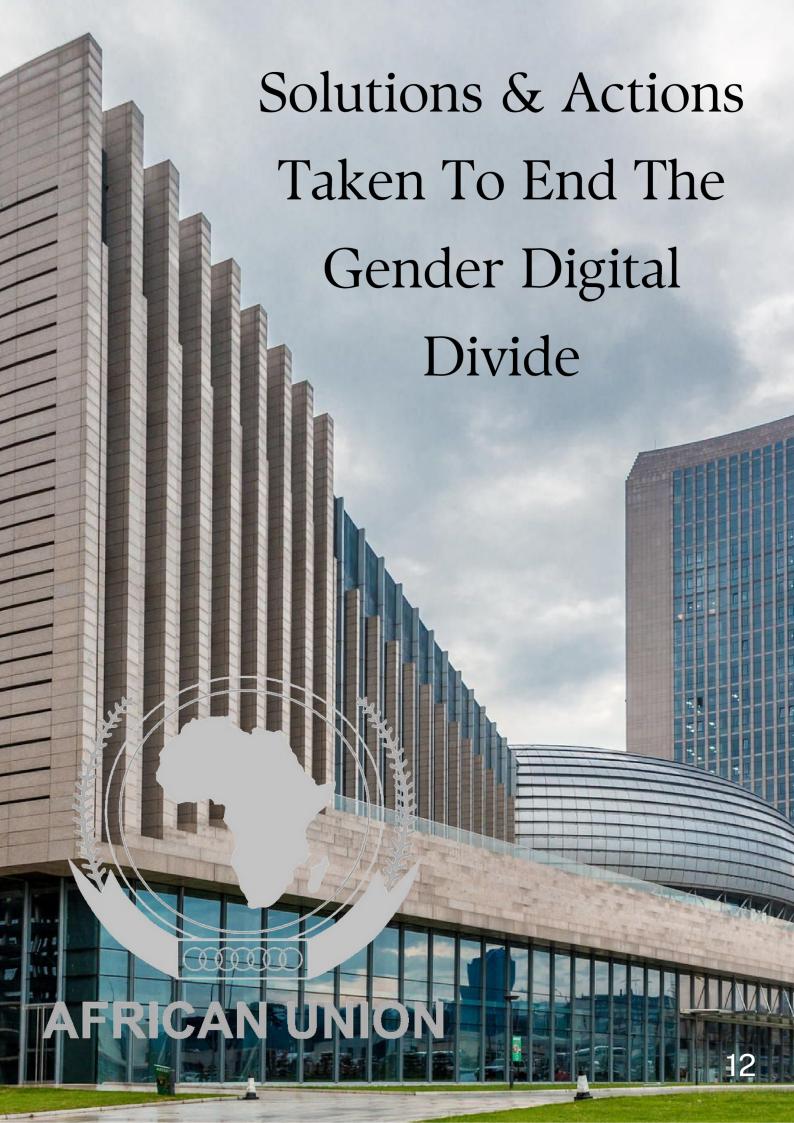


It is apparent that lack of access to or limited usage of ICTs by women would inevitably constrain the extent to which they can contribute to a country's socio economic and political development, but aside from this, other constraints are low literacy levels and access to education, time impediments as a consequence of women's triple role of domestic, productive and community management responsibilities' and geographical location as more women than men tend to live in rural areas where ICTs are not widely available (Deen-Swarray et al., 2012; Huyer and Sikoska, 2003: 15). (Adeola, O., 2020) As shown in Fig. 1.1, for example, in 2018, the ratio of female-to male mean years of education received in Sub-Saharan Africa (SSA) was a mere 68%, compared to a significant 90.7% in Eastern Europe and Central Asia and a massive 102.2% in Latin America and the Caribbean. (ibid) In 2019, the ratio of female-to-male labor force participation rate (%) in Sub Saharan Africa was 83.9%, compared to 56.5% in East and South Asia. (ibid) At the primary school level, the gender gap seems close to parity while it is massive at both secondary and tertiary levels (World Bank, 2017). (ibid) A recent report by the World Economic Forum (2020) claimed that 35 countries had achieved full parity on educational attainment with only 3 of the countries from sub-Saharan Africa and 1 in North Africa. (ibid) Also, eight countries in Africa are yet to close more than 20% of their gaps: Togo (77.8%), Angola (75.9%), Mali (75.7%), Benin (73.3%), Yemen (71.7%), Guinea (68.0%), Congo DR (65.8%) and Chad (58.9%). (ibid) These are statistics that prove that the gender gap remains wide in Africa on educational attainment.

Girls are more likely to be out of school than boys, working in agriculture, where they are often unpaid (Putnick & Bornstein, 2016).(ibid) A large percentage of non-agricultural employment is informal, low-paid work, where women are more likely to be employed as contributing family workers than their male counterparts.(ibid)

These constraints jointly contribute to confining women to technology-poor environments. (ibid) The Internet, mobile phones and digital financial services provide new avenues for the economic empowerment of women. (ibid) Despite the significant increase in mobile phone ownership and Internet usage among women, the gender gap persists in low- and middle-income countries, particularly in sub-Saharan Africa (SSA), accounting for a 15 per cent gender gap in mobile ownership and a 42 per cent gender gap in mobile Internet usage (Rowntree &

GSMA Contributors, 2019). (ibid)

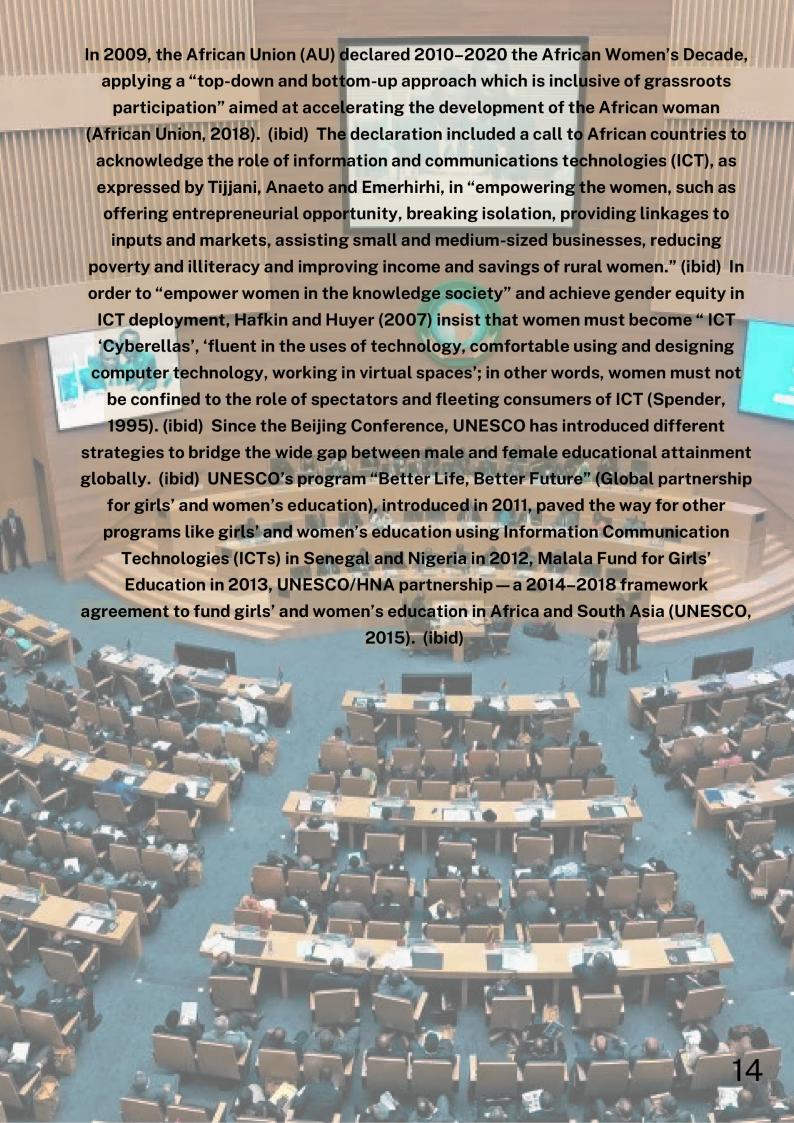


Access to technology plays an important role in empowering women, creating economic opportunities and increasing productivity. In 2012, in Rio de Janeiro, the United Nations Conference on Sustainable Development introduced a set of SDGs to serve as proactive and reactive measures to combat current and future global challenges. (Adeola, O., 2020) Those measures were adopted by the UN in 2015 in New York and are generally referred to as SDGs 2030, 2030 being the year proposed as the deadline for attainment across the globe. (ibid) SDGs 2030 consists of 17 goals (see Table 1.1) and 162 associated targets (United Nations Sustainable Development Goals, n.d.). (ibid) The 17 SDGs (see Table 1.1) encompass economic development, social inclusion, and environmental sustainability, a triple bottom-line approach that critics note was missing from the defunct MDGs (Klarin, 2018). (ibid) The United Nations acknowledged the crucial role technology plays in unlocking the full potential of women in the society when it included SDG 5, focused on gender equality, among its 17 Sustainable Development Goals (SDGs). (ibid) One target of SDG 5 is to "enhance the use of enabling technology, in particular information and communications technology, to promote the empowerment of women" (UN Women, n.d.). (ibid)

Table 1.1 United Nations 2030 Sustainable Development Goals

Goal 1 No Poverty	Goal 2 Zero Hunger	Goal 3 Good Health and Well-being	Goal 4 Quality Education	Goal 5 Gender Equality	Goal 6 Clean Water and Sanitation		
Goal 8 Decent Work and Economic Growth	Goal 9 Industry, Innovation and Infra- structure	Goal 10 Reduced Inequality	Goal 11 Sustainable Cities and Comm- unities	Goal 12 Responsible Consum- ption and Production	Goal 13 Climate Action	Goal 14 Life Below Water	
Goal 15 Life on Land	Goal 16 Peace, Justice and Strong Institutions	Goal 17 Partnerships to Achieve the Goal	United Nations SUSTAINABLE DEVELOPMENT GOALS (SDGs)				

Adapted from: UN's 2030 Sustainable Development Goals (United Nations [n.d.])



In addition to this, many grassroot organizations have been created by young African men and women that address the digital gender gap. One example would be the Gender Tech Initiative founded in Uganda. Gender Tech Initiative Uganda (GTI-U) is a non-profit organization that is dedicated to bridging the digital gender gap by empowering women and girls with the knowledge and skills they need to succeed in the digital world. (Gender Tech initiative Uganda, 2023) GTI-U has many beneficial programs including: innovation, training, research and advocacy programs that seek to advance digital literacy levels among young women, and increase levels of digital inclusion.



## Technologies are not gender neutral

In a knowledge society where virtually all significant aspects of human life (economics and commerce, politics and governance and cultural change) are woven into ICTs women risk falling further behind unless concrete steps are taken to bring them into the ecosystem of technology; and to the extent ICTs are tied to significant aspects of human life, ICTs can engender gender equality. (Adeola, O., 2020) For that to occur though, ICTs must look beyond meeting women's practical gender needs and become a strategic gender need that strikes at the core of status change for women. (ibid) Elements of this strategic gender need will include both access and use, but also encompass the introduction of a gender perspective and leadership into the ICT narrative. (ibid) Bridging the digital gender divide will require proactive thinking, planning and action. (ibid) Given that the use of ICT promotes the empowerment of women, governments in sub-Saharan Africa must put in place clear strategies to achieve SDG 5. (ibid) As expected, many SSA countries have different gender equality initiatives underway, but more can still be done. Here are some specific recommendations (ibid):



# Education and Training

The educational sector is a good starting point to increase digital literacy. Ensuring compulsory education is important for halting the widening digital gender gap in SSA. Success can be achieved in increasing the number of girls and women studying ICT and using digital tools. Compulsory schooling, particularly learning basic digital skills for global relevance, ensures that women and girls obtain the skills and competencies necessary for participation in labor markets. Courses like Programming, Robotics, Artificial Intelligence (AI), Cyber-security, Internet of Things (IoT), among other new technology-oriented ones, can be introduced early on a basic-to-intermediate level, particularly in secondary school, with the female gender encouraged to take an interest in learning. In East Africa, for instance, Kenya, particularly, I Am the Code initiative was launched for the purpose of bringing together governments, businesses and investors to assist young women by teaching them how to code. Hence, they become more digitally literate. I Am the Code initiative also made provision for digital hubs, which are located across East Africa. These hubs can operate in collaboration with schools, libraries and community centers, encouraging women to become more confident and increase their curiosity about the digital world (Heaphy, 2017). With education, African women will have the right foundation to start new businesses, create digital tools and online content, find good jobs and have better access to healthcare and financial services. Additionally, SSA must rethink, organize and coordinate the delivery of life skills to meet changing market needs, not only in the formal education system but via lifelong learning. Flexible online education should be



encouraged, particularly for adult female learners, to improve digital literacy.

## Stereotypes and Barriers

To narrow the digital gender divide, the structural factors that reinforce gender bias (at home, in the workplace and in the community) must be addressed, and this will help remove the stereotypes about technology being mainly for the male gender. Gender-specific expectations about vocations and careers are critical barriers to digital gender equality in SSA. Removing barriers to adult education, whether digital or face-to-face, will create avenues for women in SSA to upgrade their skills. Considering that most of the skills desired in digital-intensive sectors are predominantly masculine, it is appropriate to equip female workers with more management, communications and numerical skills in order to narrow the gender gap. Currently, software development and programming seem to be a maledominated realm; women are fewer in the software world, play smaller roles and are less connected to the network of developers than their male counterparts (OECD, 2018). Policy actions should target gender biases in curricula and parental preferences in the choice of career and encourage technology-oriented courses, in the light of the ubiquitous digital world.





Pink is for Girls

Women in the Workplace

Digital platforms are among the most important means of increasing participation of women in labor markets. Ensuring that women benefit from the work opportunities provided by digital technologies should be predicated on efforts to ensure that flexibility is not at the expense of desirable job features (e.g. remuneration, job security and social protection). For example, unpaid childcare and domestic chores can block women's participation in digital labor markets. Policy thinking and actions should be directed towards addressing peculiar challenges working women face, challenging gender stereotypes and promoting childcare services provision. These continued efforts will help to address norms and attitudes around childcare and domestic chores and enable greater female participation in digital labor markets and encourage digital training in SSA.

#### Innovation and Partnership

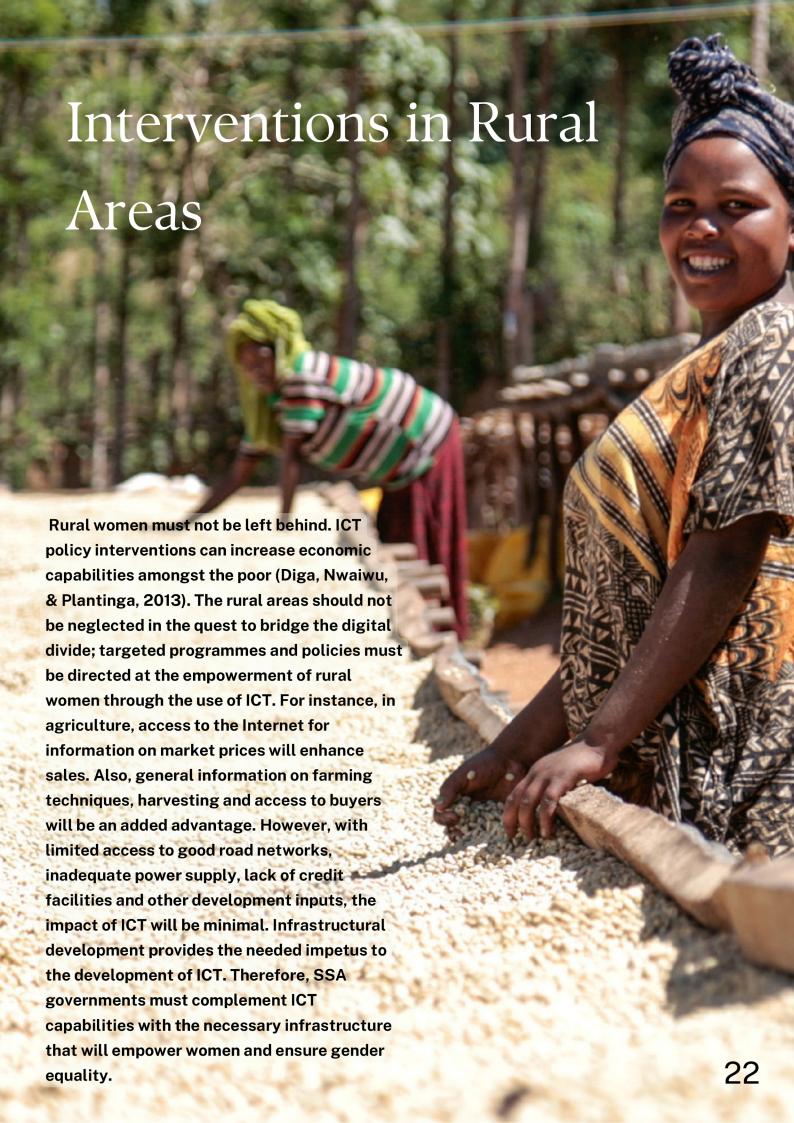
A gender divide in the composition of inventors and innovation teams signals sociocultural biases. An innovative environment that is open to women is open to important female perspectives related to the viability and usability of an invention, product or application. More involvement of women in inventive and patenting activities directly increases the economic security of women, and contributes to the economic growth and well-being of society. Targeted training provided for women will contribute to the innovative use of digital technologies.

#### Collaborative Networks

Building partnerships and collaborations with universities, companies, nonprofits and innovation incubators could help close the digital gender gap. For instance, International Telecommunication Union (ITU) and UN Women, in collaboration with the African Union Commission, launched an initiative, the African Girls Can CODE Initiative (AGCCI), aimed at equipping girls and young women in Africa with digital literacy skills (ITU News, 2018). Also, Intel and its partners committed to reduce the Internet gender gap existent in Africa. Particularly, Kenya, Nigeria and South Africa are benefiting from this initiative. By the end of 2016, Intel and its partners had trained more than 1.3 million women and girls in Africa (Intel Corporation, 2017). Technology will also help to give a voice to African girls and women, as they can have a platform to be vocal about issues concerning them and lead change on common causes, including gender equality and empowerment.

# Policies, Strategies and Plans for Increased Access

Governments in SSA must put in place policies, strategies and plans aimed at increasing Internet penetration and data availability and at reducing data cost to encourage overall usage of digital technologies. The role of mobile network operators and Internet service providers in enabling access cannot be overemphasized. Cooperation will be needed by various stakeholders to ensure adequate access. Policymakers should strive for universal access and connectivity to reach the unconnected population in SSA by 2030. Citizens, in their quest for empowerment, should regard Internet access as a critical part of their fundamental rights, guaranteed by the government. With improved Internet access, girls and women in Africa will have more access to technology, and this would increase digital literacy. Governments should consider declaring ICT a national priority and an essential sector, and should be encouraged to continue putting aside intervention funds, with a guaranteed percentage dedicated to improving girls' and women's access to and use of digital tools/ICT and empowering women in the sector. The intervention funds must be administered appropriately with identified credible organizations, nonprofits and financial institutions as partners, administrators and fund managers. They should be given mid- and long-term goals for digital gender inclusion leading up to 2030.



# Measurement & Monitoring

Policy recommendations and action plans for SSA countries will require proper implementation, monitoring and evaluation. There must be concerted efforts to bridge the digital gender gap and ensure equal access to technology in SSA through the implementation of the right policies. For effective monitoring and evaluation of progress made, data collection and analysis must be carried out regularly, with indicators on digital trends disaggregated by gender. Closing the digital gender divide requires putting in place targeted gender sensitive policies and frameworks. Progress in bridging the gender divide in SSA is non-linear; it can take a while. It, therefore, remains imperative to assess outcomes and initiate needed reforms on a continuous basis.

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#### **GENDER TECH INITIATIVE**

Gender & The Digital Divide:

Analyzing the reasons why women are behind on the wave of technology and exploring strategies to bridge the digital gender gap.

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