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DIGITAL ECOSYSTEM COUNTRY ASSESSMENT (DECA)

Kenya

SEPTEMBER 2020

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This report reflects insights from the first Digital Ecosystem Country Assessment (DECA) pilot, which was managed by the USAID U.S. Global Development Lab's Center for Digital Development (CDD) and carried out in partnership with the USAID Mission in Kenya (USAID/KEA). The report was written by Molly Dean, Kwasi Donkor, Amy Paul, and Olu Olutola in collaboration with Raiyan Kabir and Inta Plostins via the Digital Frontiers project at DAI. Report design and graphics were provided by Stefan Peterson via Digital Frontiers.

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TABLE OF CONTENTS

Executive Summary . . . 3

Digital Ecosystems and the Response to COVID-19 . . . 5

Section One: About this Assessment . . . 7

Section Two: Kenya DECA Findings . . . 8

2.1 Strengths in Kenya's Digital Ecosystem . . . 8

2.1.1 Government Commitment to Digital . . . 8

2.1.2 Kenya's Expanding Digital Infrastructure . . . 9

2.1.3 Emerging County-Level Leadership . . . 11

2.1.4 Civil Society Engaged in Digital Issues . . . 12

2.1.5 Kenya's Digital Revolution: Digital Tools for Peace-building, Financial Inclusion, and Beyond . . . 14

2.1.6 Silicon Savannah's Rich Innovation Culture . . . 15

2.2 Challenges In Kenya's Digital Ecosystem . . . 16

2.2.1. Overcoming Barriers to Effective Engagement in the Digital Ecosystem . . . 16

2.2.2 Protecting Individuals and Organizations from Digital Harm . . . 21

2.2.3 Leveraging the Digital Ecosystem for Inclusive Economic Growth . . . 25

Section Three: Ecosystem-Level Opportunities & Recommendations . . . 29

3.1 Consumer Protections and Cyber Hygiene Safeguards: Promoting Safe and Responsible Citizen Engagement . . . 29

3.2 Deepening Devolution through County-Level Digital Capacity and Leadership . . . 30

3.3 Promoting Digital Inclusion: Expanding Infrastructure, Lowering Data Costs, and Investing in Localized, Accessible Content . . . 31

3.4 Strengthening Kenya's Silicon Savannah and Mobilizing Private Capital for Stronger Economic Growth . . . 31

Appendix . . . 34

Appendix A: Definitions . . . 34

Appendix B: Methodology . . . 36

Appendix C: Key Informants . . . 38

Appendix D: References . . . 40

ACRONYMS

A4AI	Alliance for Affordable Internet
ACWICT	African Centre for Women, Information and Communications Technology
BAKE	Bloggers Association of Kenya
CATI	Computer Assisted Telephone Interviewing
CDCS	USAID Country Development Cooperation Strategy
CDD	Center for Digital Development (within USAID's U.S. Global Development Lab)
CIH	Constituency Innovation Hub
CSO	Civil Society Organization
DCCP	Digital Connectivity and Cybersecurity Partnership
DECA	Digital Ecosystem Country Assessment
DFS	Digital Financial Services
FinTech	Financial Technology
GDP	Gross Domestic Product
GDPR	General Data Protection Regulations
GIS	Geographic Information Systems
GNI	Gross National Income
GNP	Gross National Product
GoK	Government of Kenya
ICT	Information and Communications Technology
IFMIS	Integrated Financial Management System (IFMIS)
ISP	Internet Service Provider
KEPSA	Kenya Private Sector Alliance
KES	Kenyan Shilling
KeSIG	Kenya School of Internet Governance
KICTANet	Kenya ICT Action Network
MFI	Microfinance Institution
MNO	Mobile Network Operator
MoICT	Ministry of ICT, Innovation, and Youth Affairs
OAA	Office of Acquisition and Assistance
PAYG	Pay-As-You-Go
PII	Personally Identifiable Information
POC	Point of Contact
SHS	Solar Home System
SME	Small and Medium-Sized Enterprise
STEM	Science, Technology, Engineering, and Mathematics
TA	Technical Assistance
TDY	Temporary Duty
TVET	Technical and Vocational Education and Training
TVWS	TV White Space
USAID/KEA	USAID/Kenya and East Africa
USF	Universal Service Fund

BOXES

BOX 1. Breaking Down Barriers: Project Rubicon I 13
BOX 2. The Potential of E-Commerce 15
BOX 3. Relevant Content: The Power of Relatable Messaging to Drive Positive Social Change 19
BOX 4. Programs Promoting Digital Literacy in Kenya 20
BOX 5. Encouraging Women and Girls to Engage With Tech 27
BOX 6. Quick Reference Guide For Any Digitally Enabled Program 32

TABLES

TABLE 1. Cyber Threats Detected 2018-2019 22

FIGURES

FIGURE 1. Building a Network 10
FIGURE 2. Accessing the Internet – GeoPoll Results 18
FIGURE 3. Digital Loans – GeoPoll Results 24
FIGURE 4. MNO Market Shares 2015-2019 26
FIGURE 5. Summary of Key Informant Interviews, by Sector 36

Executive Summary

Kenya hosts a dynamic digital ecosystem and has been a longstanding leader in technology innovation across sub-Saharan Africa. The country's digital ecosystem continues to rapidly evolve. In upcoming years, Kenya's information and communications technology (ICT) sector will be challenged to grow inclusively, securely, and in ways that support democratic values. Against this backdrop, USAID's Digital Strategy was launched in April 2020 with the aim to improve USAID development and humanitarian assistance outcomes through the responsible use of digital technology, and to strengthen the openness, inclusiveness, and security of partner countries' digital ecosystems.

One critical tool under USAID's Digital Strategy is the Digital Ecosystem Country Assessment (DECA). The DECA is a structured research and assessment process that supports USAID Missions to identify opportunities, maximize benefits, and manage risks associated with digital technology. It aims to help USAID's partner countries along their journey to self-reliance through a better understanding of each country's digital ecosystem. The goal of the DECA is to examine how Kenya's digital ecosystem can be strengthened to create a more inclusive, safe, and enabling environment for pursuing development objectives, and can be leveraged to accelerate the achievement of development goals. It does not aim to evaluate the efficacy of existing program portfolios, nor do a deep dive on digital technology across each development sector.

This report summarizes findings from the DECA pilot in Kenya, which was conducted between November 2019 and April 2020. The pilot combines findings from desk research, consultations with USAID/KEA,[1] data from a nationally representative survey, and two weeks of in-country research. A total of 56 key informant interviews were conducted, representing a range of public and private stakeholders and USAID/KEA technical offices. With a focus on devolution, digital divides, the youth bulge, corruption mitigation, economic growth, and private sector engagement, this report outlines key aspects of Kenya's digital ecosystem. This includes the the following:

Kenya's digital ecosystem has significant strengths not yet fully leveraged:

- **Political interest in digital technology at national and county level:** The Government of Kenya's (GoK) digital economy blueprint, ICT Masterplan, and eCitizen (government service platform for Kenyan citizens and residents) are only a few of many digital initiatives undertaken to transform Kenya into a thriving middle-income country by 2030. County-level programming such as County Data Desks have demonstrated great initiative by county leadership in embracing digital tools to ensure a more transparent and efficient process.
- **Relatively strong digital infrastructure:** Kenya's expanding ICT infrastructure and GoK's pursuit of innovations driving connectivity (e.g., Google Loon pilots) demonstrates an investment in Kenya's inclusive future.
- **Strong private sector engagement in digital innovation:** From large mobile network operators and multinational tech companies to startups and aspiring entrepreneurs, Kenya's rich innovation culture is an undervalued and underleveraged national resource.

1 The USAID Mission based in Nairobi serves Kenya as well as the East Africa region; this report uses USAID/KEA to refer to Kenya and East Africa. The scope of this assessment, however, is strictly limited to Kenya.

- **Active civil society:** Multiple organizations are actively advocating for fair, equitable policies and safeguards for citizen protections, promoting government transparency and data privacy regulation, online freedoms, and fair business practices.

- **Untapped opportunities to strengthen and leverage data-sharing:** There is significant opportunity for increased data-sharing and transparency across the GoK, donors, and other key stakeholders; to better inform and improve decision-making, strategic planning, and programming; and to foster greater self-reliance on a national scale.

Kenya's digital ecosystem will face challenges to inclusivity, safety, and productivity as it evolves:

- **Barriers to effective access and use of digital technologies:** The high cost of data, severe gaps in last-mile connectivity, limited investment in tailored and relevant online content, and low levels of digital literacy disproportionately affect more underserved parts of the population (such as women, youth, and more rural communities).

- **Protection of individuals and organizations from digital harm:** Limited government capacity to implement and enforce data privacy and cybersecurity regulations; highly concentrated control of sensitive data; increased activity from foreign multinationals lacking adequate citizen protections; lack of strong consumer protections in Kenya's business culture; and increasing levels of misinformation and disinformation (especially campaigns designed to subvert democratic processes) all create high levels of vulnerability across the digital ecosystem.

- **Adequately leveraging the digital ecosystem for inclusive economic growth:** With the M-Pesa mobile money platform linked to almost all payment systems across Kenya, technology companies can easily build upon Safaricom's (Kenya's largest telecom provider) business model, but new innovation and competition outside of this is largely disincentivized

There exists incredible opportunity for the international development community and private sector to further engage and strengthen Kenya's digital ecosystem. While digital connectivity and innovation are well rooted in Nairobi, there are significant disparities in access to affordable, relevant digital content and tools for rural and lower-income consumers outside the capital. There is substantial untapped opportunity to support extended connectivity, push the Safaricom ecosystem toward more affordable data services and improved localized content delivery, and increase basic digital skills and literacy for those who are currently excluded, especially women, youth, and rural populations. At the same time, this extension of digital connectivity, content, and digital literacy can complement county-level initiatives by preparing citizens and institutions to better leverage digital platforms and tools for stronger accountability and governance throughout the devolution process.

Digital governance will play an increasingly important role in Kenya's digital economy as data privacy, cybersecurity, digital identity, and consumer protections support a safe and secure digital ecosystem for all citizens. These factors will largely influence the future and success of the "Silicon Savannah", youth participation and employment in the sector, and the industry's capacity to mobilize private capital for stronger economic growth, harnessing healthy market competition that embodies democratic values and strong citizen protections.

ROADMAP FOR THE REPORT

Section 1 provides background on the DECA framework and goals.

Section 2 presents the key findings about Kenya's digital ecosystem. This section is organized into two sub-sections: strengths in Kenya's digital ecosystem and challenges in Kenya's digital ecosystem.

Section 3 provides recommendations on how the digital ecosystem can be leveraged and strengthened to achieve improved development outcomes.

DIGITAL ECOSYSTEMS AND THE RESPONSE TO COVID-19

Though the Kenya DECA was conducted prior to the COVID-19 outbreak, the global pandemic has highlighted the critical role of digital technology in Kenya and around the world.

The COVID-19 crisis will affect the development landscape across every sector, and no matter the implications, digital technologies will be critical. Responders and decision makers all over the world need detailed and timely data about the disease's spread, and health workers and communities need accurate information to protect themselves. Additionally, work, education, and government service delivery must adapt to meet individual and organizational needs, especially those of marginalized and vulnerable populations. Many relevant solutions depend on mobile or Internet connectivity. There are many ways in which technology can increase readiness to prevent, detect, and respond to COVID-19 and its effects. At the same time, well-intended but poorly executed digital systems can hamper pandemic response by creating duplicative systems and siloing vital information.

Since the 2014 Ebola outbreak in West Africa, the development community has learned a lot about how best to deploy technology in a public health crisis. Key lessons include ensuring country governments are leading from the outset, advancing a locally led and whole-of-government approach, and coordinating all related initiatives. Establishing data protocols, reusing existing digital tools, and working with the private sector are essential. Though the COVID-19 pandemic differs in many ways from the 2014 outbreak, it is valuable to evaluate the present situation with these lessons in mind.

Many of the following recommendations could be a way to lay the foundation for better leveraging and strengthening Kenya's digital ecosystem in the context of the COVID-19 crisis, including:

- **Deepen the use of existing digital solutions in line with the Principles for Digital Development:** Digital financial services and contactless transactions will play an important role during the COVID-19 response and recovery efforts. During the Ebola crisis in Liberia, for example, mobile money payments to frontline health workers helped avert strikes by unpaid response workers. Kenya is already taking steps to deepen mobile money through reduced transaction fees and increasing transaction limits for small businesses. Understanding usage patterns of digital technology and affordability of data is especially important in times of crises to understand for whom digital solutions will be accessible, and how broader social disruptions are likely to affect access to and use of digital technology. This could be a timely opportunity to prioritize efforts that lower cost, increase access, and improve inclusion of digital services and platforms more broadly.

- **Ramp up efforts to strengthen digital literacy across all segments of the population:** As service provision, payments, and public information increasingly shift to online platforms, it is critical that all citizens have the necessary skills to safely and effectively access these platforms in order to ensure an inclusive and comprehensive response. Digital literacy will be especially important for rural, lower income, and more vulnerable populations. Particularly with regard to education, many youth may become reliant on online content delivery. Strengthening the enabling environment, skills training, and access considerations for digital education platforms will be critical in mitigating subsequent negative impacts of COVID-19.
- **Promote digital security for individuals and organizations:** As people spend more time online and are using new communication and video technologies, they are increasingly vulnerable to cybersecurity threats, and many local organizations have already seen an increase in cyberattacks.[2] Now is the time to assess cybersecurity vulnerabilities and make plans to boost the cyber hygiene of relevant actors accordingly.
- **Support national and devolved government digital systems with adequate protections:** The GoK will play a critical role in providing trustworthy information and necessary social support via services such as eCitizen. As more information circulates, countering misinformation will become critical to build citizen trust and cooperation. At the same time, there may also be a push to collect and use more personally identifiable information (PII), enhance surveillance, and restrict freedoms as COVID-19 response efforts expand. This only adds urgency to the need to develop and implement protections on data privacy and Internet freedom in ways that balance public health needs, consumer protections, and digital rights.
- **Support financial innovation and inclusive economic growth:** The economic pressures of COVID-19 paired with an increased demand for contactless transactions could be a driving force for growth across the digital economy, especially in areas such as digital health, digital finance, and e-commerce. Now is the time to leverage Kenya's existing strengths via M-Pesa and other mobile money products and also enable market entry for smaller financial technology (FinTech) companies to enable further innovation for greater financial inclusion and digital access.

It is important now more than ever to understand Kenya's digital ecosystem and how it can be strengthened and leveraged to support and build responsive systems, adjusting to the needs of more vulnerable and marginalized populations such as rural, last-mile communities, and refugees.

For more information on technology in global health crises, see:

- COVID-19 and Digital Development Considerations
- USAID COVID-19 Summary Information Page
- Considerations for USAID Mission Staff for Programmatic COVID-19 Preparedness and Response: Digital Technologies and Data Systems
- Fighting Outbreaks with Information: Learning from the Use of Data, Information, and Digital Technologies in the West Africa Ebola Response
- The Role of Digital Financial Health Services in Accelerating USAID's Health Goals
- Guidelines for Adopting Remote Monitoring Approaches During COVID-19

2 Rebecca Root, "COVID-19 brings wave of cyberattacks against NGOs," DevEx, last modified April 13, 2020, https://www.devex.com/news/covid-19-brings-wave-of-cyberattacks-against-ngos-96934

SECTION ONE

About this Assessment

USAID's Digital Strategy has two objectives: 1) improve measurable development and humanitarian assistance outcomes through the responsible use of digital technology in USAID's programming and 2) strengthen the openness, inclusiveness, and security of country-level digital ecosystems. The Digital Ecosystem Country Assessment (DECA) is intended to be a semi-standardized tool that will support the implementation of the USAID Digital Strategy.

The DECA aims to help USAID, its partners, and other relevant stakeholders identify opportunities, maximize benefits, and manage risks associated with digital technologies. The DECA is intended to assist these stakeholders in better understanding a country's digital ecosystem and how it can be leveraged and/or strengthened to enable accelerated development impact.

What is a digital ecosystem?

A digital ecosystem comprises stakeholders, systems, and an enabling environment that together empower people and communities to use digital technology to access services, engage with each other, and pursue economic opportunities.

The DECA examines three broad areas to understand the opportunities and challenges in a country's digital ecosystem:

1. Digital Infrastructure, Access, and Use
2. Digital Society and Governance
3. Digital Economy

In addition to the three general pillars of digital ecosystems, several cross-cutting development priorities informed this analysis for Kenya: digital divides (e.g. urban/rural, gender, and age gaps), devolution, youth unemployment, economic growth, private sector engagement, and mitigating corruption.

The DECA is in a pilot phase from September 2019 through August 2020. USAID/KEA was the second pilot and took place between November 2019 and February 2020. USAID's Center for Digital Development (CDD), with support from DAI's Digital Frontiers project, conducted the Kenya pilot assessment in partnership with USAID/KEA staff in Nairobi. The Kenya DECA process consisted of targeted desk research, a nationally representative mobile phone-based survey, consultations with USAID/KEA, and two weeks of in-country research.[3] More than 50 in-country interviews with stakeholders from academia, civil society, the private and public sectors, and USAID/KEA technical offices informed the team's understanding of Kenya's digital ecosystem.

Rather than acting as an authoritative reference source on the country's digital ecosystem, the DECA is intended to be a rapid assessment of opportunities and challenges tailored to USAID's programmatic priorities. The DECA is not intended to cover all development sectors but acknowledges and aims to complement other sector-focused resources and tools.[4]

3 See Appendix B for a detailed description of the DECA methodology.

4 Multiple tools and assessments exist for digital health ecosystems in particular. Please see https://wiki.digitalsquare.io/index.php/Digital_Health_%26_Interoperability_Working_Group#Maturity_assessments for specific resources.

SECTION TWO

Kenya DECA Findings

This section outlines findings from the Kenya DECA into two broad lenses of identified strengths and challenges. Kenya has made significant strides in securing its position as the regional leader in technological advancements, however, without addressing some of the major hurdles the country currently faces, it runs the risk of creating a digital ecosystem that is not inclusive and safe for its citizens.

2.1 STRENGTHS IN KENYA'S DIGITAL ECOSYSTEM

The Government of Kenya (GoK) is supportive of digital technology and innovation, with technology being a key enabler of the Kenya Vision 2030. Recent GoK strategies like the Digital Economy Blueprint further reinforce the GoK's commitment to digital systems. The country has strong mobile coverage, with approximately 88 percent of the population covered by a 3G (third generation) or higher network signal.[5] Many stakeholders across the public sector, private sector, and civil society are highly engaged in advocacy, research, and implementation of digital activities. With this background, Kenya has a rich startup and innovation culture, and has become a leader in technology innovation and digital payments in East Africa.

88 percent of the population of Kenya is covered by a 3G or higher network signal.

2.1.1 GOVERNMENT COMMITMENT TO DIGITAL

Kenya Vision 2030 is the GoK's long-term development blueprint to transform the country into a thriving middle-income country by 2030. ICT as well as science, technology, and innovation are key foundational focus areas for Kenya's vision.[6] The Vision highlights the GoK's intention to strengthen national infrastructure, industry, and public service delivery through ICT, as well as strengthen county-level capacity in digital technology, spanning investments in workforce and education to innovation in priority sectors.

The GoK's commitment to digital is endorsed through its formation of regulatory bodies such as the ICT Authority (a State Corporation under the Ministry of ICT) as well as government strategies including the Kenya National ICT Masterplan 2017 and the Digital Economy Blueprint. The ICT Authority's mandate is broad and covers the management of several key GoK initiatives, including management of the National Optic Fibre Backbone[7] and the Digital Literacy Programme;[8] a Distributed Ledgers and Artificial Intelligence Task Force;[9] the Presidential Digital Talent Programme;[10] the Government Data Centre; and support across GoK and county governments for training and advisory purposes.

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5 This represents the percentage of the population covered by at least a 3G mobile network (within range of at least a 3G mobile-cellular signal, irrespective of whether or not they are subscribers); "Kenya | Detail and Analysis, Index Score 2018," GSMA Mobile Connectivity Index, accessed March 12, 2020, https://www.mobileconnectivityindex.com/#year=2018&zonelsocode=KEN&analysisView=KEN

6 "About Vision 2030," Kenya Vision 2030, accessed April 8, 2020, https://vision2030.go.ke/about-vision-2030/.

7 "National Optic Fibre Backbone (NOFBI)," ICT Authority Kenya, accessed April 8, 2020, http://icta.go.ke/national-optic-fiber-backbone-nofbi/

8 "Digischool," ICT Authority Kenya, accessed April 8, 2020, http://icta.go.ke/digischool/

9 ICT Authority of Kenya, "Distributed Ledgers and Artificial Intelligence Task Force," accessed May 15, 2020. https://ict.go.ke/taskforce-on-distributed-ledgers-and-artificial-intelligence-presentation-schedule/

10 "Presidential Digitalent Programme," ICT Authority Kenya, accessed April 8, 2020, https://digitalent.go.ke/

The GoK has been successful in achieving many of its National ICT Masterplan goals for 2017 such as Kenya's recognition as being a regional ICT hub, and ICT being recognized as a standalone economic sector.[11] While there are still a number of barriers to overcome in its implementation, the gradual transition to digitize government services (e.g. eCitizen.go.ke) signifies the GoK's intention to become a digitally productive economy. The GoK is taking steps to centralize biometric information through the *Huduma Namba* digitized identity system and streamline access to public services through county and national level *Huduma* centers. The Digital Economy Blueprint highlights the rationale for using digital technology in various aspects of the economy to spur innovation and growth. It identifies the following five pillars as 'carriers' of growth: digital government, digital business, infrastructure, innovation-driven entrepreneurship, and digital skills and values.[12]

In addition to the strategies above, the GoK is also in the process of finalizing the National ICT Infrastructure Master Plan, which will serve as a guideline to ensure the provision of "accessible, affordable, reliable, quality, and secure infrastructure in Kenya."[13]

2.1.2 KENYA'S EXPANDING DIGITAL INFRASTRUCTURE

Kenya's physical ICT infrastructure is relatively strong. Approximately 95 percent of the population is covered by at least 2G (second generation) networks, 88 percent by 3G, and 61 percent by 4G (fourth generation) or more, with plans to roll out 5G (fifth generation) networks in the near future.[14] The GoK and a handful of private sector firms have rolled out fiber optic cables in select parts of the country as part of the National Optic Fibre Backbone Infrastructure (NOFBI), which contributes to high coverage rates. (However, it is important to note that a significant amount of this is "dark fiber," meaning that it is not frequently used.) To continue funding the construction of cell towers in underserved rural areas, the Communications Authority of Kenya launched Kenya's Universal Service Fund (USF) in 2009, with Mobile Network Operator (MNOs) required to contribute up to 0.5-1 percent of their gross annual revenue into the USF, though with mixed results (see Section 2.2.1).[15]

The Digital Divide Explained

The digital divide is the distinction between those who have access and can use digital products and services and those who are excluded. There are often overlapping digital divides that stem from inequities in literacy, cost, social norms, or availability of relevant content. Digital divides may be associated with gender, economic status, geography, and age among other factors.

Recognizing challenges of last-mile connectivity and underutilization of existing "dark" fiber, the GoK is recommitting to ICT infrastructure with its expected release of the ICT Infrastructure Master Plan 2019-2020. This document lays out the GoK's vision for achieving universal, affordable access to broadband connectivity in the next ten years.[16]

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11 "The Kenya National ICT Masterplan 2014-2017," Ministry of Information Communications and Technology, accessed April 8, 2020, http://icta.go.ke/pdf/THE%20NATIONAL%20ICT%20MASTERPLAN%202017.pdf.

12 "Digital Economy Blueprint: Powering Kenya's Transformation," Republic of Kenya, accessed April 8 2020, https://www.ict.go.ke/wp-content/uploads/2019/05/Kenya-Digital-Economy-2019.pdf

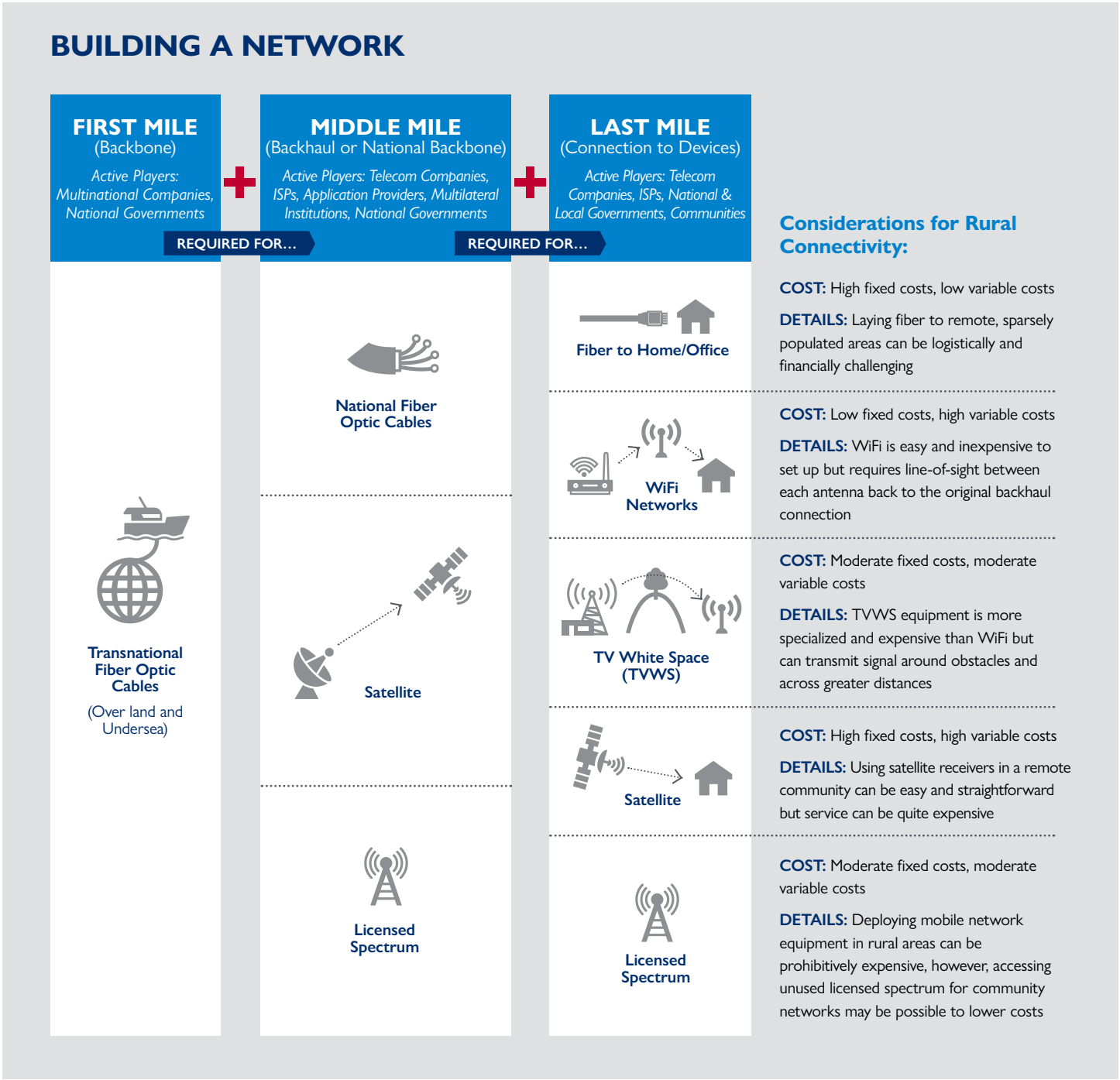
13 "Draft National ICT Infrastructure Masterplan 2019-2029," Ministry of Information Communications and Technology, accessed April 8, 2020, http://icta.go.ke/powerassets/uploads/2019/11/ICT_Infrastructure_Masterplan_v10Print-Version2_NoCopy.pdf

14 "Kenya | Detail and Analysis, Index Score 2018," GSMA Mobile Connectivity Index, accessed March 12, 2020, https://www.mobileconnectivityindex.com/#year=2018&zoneIsocode=KEN&analysisView=KEN

15 Communications Authority of Kenya, "Universal Service Fund (USF) Framework," https://ca.go.ke/wp-content/uploads/2018/02/Universal-Service-Fund-Framework.pdf

16 "Draft National ICT Infrastructure Master Plan 2019-2029," ICT Authority (Ministry of ICT, Government of Kenya,) last modified August 2019, http://icta.go.ke/powerassets/uploads/2019/11/ICT_Infrastructure_Masterplan_v10Print-Version2_NoCopy.pdf

FIGURE 1. Building a Network



In addition to GoK efforts, other organizations are working to address connectivity challenges in Kenya. Partnerships with private sector firms are exploring ways to expand access using a variety of connection modalities, from free public hotspots to TV whitespace to high flying balloons. Mawingu, a Kenyan organization testing innovative approaches to increase Internet accessibility and close gender divides in last-mile connectivity, has been a pioneer in TV white space technology in Kenya. Recent collaborations with Microsoft, Unilever, and Shujaaz are testing several models to increase inclusive access and use for last-mile communities (see Box 1). BRCK, a Nairobi based startup, manufactures routers that enable free, public WiFi hotspots—known as "Moja"—to users with a 3G device. BRCK's SupaBRCK is a solar-powered device that brings WiFi to remote areas with little to no

connectivity and has the capacity to create 100 Internet connections via their Moja service.[17] Alternatively, Google Loon uses high-altitude balloons carrying 4G base stations to provide Internet coverage to rural Kenya.[18] Following the onset of the 2020 COVID-19 health crisis, Kenyan President Kenyatta recently announced the approval of Loon infrastructure to extend connectivity in hopes of ensuring workforce productivity amidst national social distancing efforts.[19] Improving quality and consistency of Internet connectivity is an ongoing challenge, but Kenya is well-positioned to utilize a variety of approaches to extend Internet access.

2.1.3 EMERGING COUNTY-LEVEL LEADERSHIP

Under Kenya's new devolved governance structure, several counties have begun embracing digital tools as part of their operations, increasing government transparency to some degree through various service delivery channels. For example, Makueni County launched an open contracting portal in late 2019, the first of its kind in Kenya. The portal provides detailed information about each step along the tender and award procurement process and insights about past awards. Other tools in the portal also allow government users to view metrics that may indicate the risk of corruption.[20]

Some national government directives have also helped advance technology adoption at the county level. For example, Kenya's County Government Act 2012 signaled an intent to strengthen county governance through the use of geospatial technologies.[21] While initially slow to roll out, Vihiga county was ultimately chosen as the model county to deploy geographic information systems (GIS) to facilitate management and planning by mapping key service infrastructure.[22] In 2019, the county launched the first Geospatial Technology Service Lab to improve service delivery and host databases for the 14 counties of the Lake Region Economic Block.[23]

County level activities such as Nakuru's "tweeting chief" use of Twitter to enable direct communication with residents and strengthen his response to community concerns,[24] and Elgeyo-Marakwet County's Data Desk,[25] offer examples of potential entry points to develop and leverage digital technology to foster greater capacity, transparency, and data-driven decision making at the county level.

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17 "BRCK: Most Innovative Company," Fast Company, accessed April 10, 2020, https://www.fastcompany.com/company/brck

18 Kori Hale, "Google's 'Loon' Internet Flies into the Amazon After Connecting Kenya," Forbes, last modified November 23, 2019, https://www.forbes.com/sites/korihale/2019/11/23/googles-loon-internet-flies-into-the-amazon-after-connecting-kenya/#7e968138bd24

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22 Ibid.; Vihiga partnered with ESRI Global, LocateIT, AIRBUS, and FAO-U to leverage GIS for county level operational planning; "Kenya passed a law mandating all counties to develop GIS-based database systems and the results are incredible," Space in Africa, last modified May 21, 2019, https://africanews.space/kenya-passed-a-law-mandating-all-counties-to-develop-gis-based-database-systems-and-the-results-are-incredible/

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24 "A Chief Kariuku tweet saved a family in Nakuru," Citizen Digital, last modified January 10, 2018, https://citizentv.co.ke/news/a-chief-kariuki-tweet-saved-a-family in-nakuru-187676/.; Ken Abuya, "Just How Convenient was Twitter's +8988 SMS Code Before Safaricom Axed It?, Techweez, last modified November 13, 2018, https://techweez.com/2018/11/13/twitter-sms-code-safaricom//

25 "Kenya's First County Data Desk Launched," Open Institute, last modified October 15, 2019, https://openinstitute.com/kenyas-first-county-data-desk-launched/

2.1.4 CIVIL SOCIETY ENGAGED IN DIGITAL ISSUES

Kenya has an active community of civil society organizations (CSOs) focused on digital ecosystem issues, ranging from ICT policy, consumer and data protection, and the protection of citizen rights across platforms. Kenya's 2010 Constitution codified the rights of freedom of expression and freedom of the media,[26] but disputes still emerge between regulators and advocacy organizations on practical implications in the digital sphere. Organizations such as Bloggers Association of Kenya (BAKE) and Article 19 have played an important role in challenging laws and legislations that limit freedom of expression and freedom of speech, with varying degrees of success. Local judicial circuits have played an important and effective role in curtailing policies inconsistent with a safe, secure, accountable digital ecosystem.

Interviewees noted the importance of open and respectful dialogue with government representatives in advocating for higher impact changes in laws and regulations. For example, the Kenya ICT Action Network (KICTANet) submitted policy recommendations about the Computer and Cybercrimes Bill 2017 during a public input window on such topics as privacy, identity theft, fake news, and the exploitation of minors.[27] Organizations like KICTANet also strive to strengthen capacity on digital issues across stakeholder groups through initiatives like the Kenya School of Internet Governance (KeSIG) (see Box 4). Other CSOs like Mzalendo Trust—a Parliamentary watchdog—have made digital technology a core part of their work, posting annual scorecards about parliamentarians online and using social media and SMS to engage with the public. Kenya's CSO community comprises key stakeholders in the digital ecosystem, and is playing an important role especially around digital rights and Internet freedom.

Photo credit: Internet Society

26 "Kenya's Constitution of 2010," Constitute Project, last modified February 4, 2020, https://www.constituteproject.org/constitution/Kenya_2010.pdf?lang=en

27 "What professionals want in the law to police the Web," Business Daily, last modified February 21, 2018, https://www.businessdailyafrica.com/corporate/tech/What-professionals-want-in-the-law-to-police-the-Web/4258474-4314620-og2gjhz/index.html

BOX 1: Breaking Down Barriers: Project Rubicon I

Mawingu is a Kenyan organization testing innovative approaches to increase Internet accessibility and close gender divides in last-mile connectivity. Mawingu launched as a community project to extend Internet access for households and businesses in underserved areas. Although an early pioneer in Kenya for utilizing TV white space[1] to increase access, Mawingu now supports connectivity through a combination of TV white space, traditional wireless connections, and last-mile fiber. In May 2019, Mawingu completed the first phase of Project Rubicon which aims to improve internet access and provide socially impactful content to low-income Kenyans. The pilot identified promising ways to lower the cost of the Internet, increase uptake, and reduce gender gaps.

AFFORDABLE INTERNET LEADING TO INCREASED UPTAKE

To test whether lowering the cost of the Internet can increase user engagement, the project provided free WiFi for two months over its network of hotspots and several merchants with TV white space radio in Embu County. This resulted in a 16 percent increase in product sales for the merchants, in addition to a significant growth in new and existing monthly active users during the free Internet trial. The pilot also led to a change in the gender ratio of customers. Among youth (17-25), the gender gap in the uptake of Mawingu Internet reduced from 40 percent to 10 percent. Further, the results of the pilot indicate an increase in registered Mawingu users by 25 fold, enough to suggest that dramatic, sustained reductions in the cost of data are feasible with a business model that relies on small payments from large numbers of subscribers.

INCREASED WOMEN AND YOUTH PARTICIPATION THROUGH OFFLINE EVENTS

Mawingu's work extends beyond providing infrastructure. Rubicon I highlighted that connectivity alone is not enough to prompt new Internet use among previously excluded groups of women and low-income youth. Project Rubicon I aimed to bridge the gap between analog life and a digital experience by hosting in-person events on the ground—bringing like-minded young women and youth together to share their stories and learn from each other. Face-to-face interactions were important for low-income individuals, not only to go online, but to develop their new "online identity" enabling them to explore the Internet with confidence.

These offline events increased the percentage of female participants from 30 percent to 40 percent. While the milestone was to reach 1,000 women and youth through offline events, the project reached 4,476 women and youth by April 2019. Small focus groups empowered women to share their interests and find related online content. The project found that women's engagement was best in groups for women only; men's engagement was best in mixed gender groups. These forums for sharing experiences along with rolling out content for specific localities helped to increase access and use by both genders.

RELEVANT CONTENT

After getting new users online, Rubicon I focused on promoting relevant content—"what to do online." Mawingu and Shujaaz, Inc directed links to users to promote positive use of the Internet and guide their users. Mawingu encouraged the uptake of government services in Embu County by pushing websites such as ecitizen.co.ke and kra.go.ke, resulting in an uptick of eGovernment service use. During the pilot period, Embu had the second highest traffic in Kenya of people accessing government services, behind Nakuru which also has free WiFi. Shujaaz focused on pushing their Hustla-MBA playlists to teach youth more about starting a business. This also resulted in increased views of the videos, even after the pilot period.

Sources: Key informant interviews with Well Told Story (Shujaaz Inc.) and Mawingu Networks; "Project Rubicon: Final Report." Well Told Story and Mawingu Networks. Last modified 2019.

[1] The unused spectrum between TV stations that can be capitalized upon for increased connectivity. See Appendix A *for a detailed definition.*

2.1.5 KENYA'S DIGITAL REVOLUTION: DIGITAL TOOLS FOR PEACE-BUILDING, FINANCIAL INCLUSION, AND BEYOND

Kenya's emergence as a leader in technology innovation has strong links to its history of political conflict and peacebuilding efforts. Mobile technology has played a key role in both the lead up and response to the political violence during the 2007/2008 elections, prompting the launch of tools such as the crowd-sourced crisis response platform Ushahidi.[28] This ushered in a new wave of "tech for good" investment in the positive use of digital technology and information sharing platforms to strengthen democratic processes, increase counterterrorism measures, and provide an outlet for citizen voices.[29] Since 2008, the interplay between politics, digital technology, and social media has been a significant driver of the technology sector, from motivating app development for conflict prevention to shaping political dialogue and becoming a forum for political expression.[30]

Photo credit: Erik Hersman, Ushahidi

At the same time, the launch and subsequent success of Safaricom's mobile money platform, M-Pesa has played a critical role in providing a platform for diverse tech innovation in Kenya that extends to nearly all development sectors. The introduction of M-Pesa in 2007 revolutionized the payments and financial services sectors in Kenya, allowing those without access to formal financial services to send and save money, and pay for goods and services over their phones for the first time. M-Pesa's reach has grown exponentially since its launch, now covering more than 26 million users — over half of Kenya's total population.[31] The value proposition of M-Pesa has been so strong that it has driven an uptake in mobile phone use for women across Kenya, reducing gender gaps around female phone ownership.[32] Research also shows that having an M-Pesa account can strengthen household resilience and, in some cases, facilitate stable transitions out of poverty.[33]

Safaricom has continued to advance the M-Pesa platform over the past 13 years, and in addition to financial services (offering loans, savings, and insurance products in partnership with local banks), a conglomerate of linked digital startups have evolved, such as digital health platform M-TIBA. Other innovations comprise Safaricom's various partnerships – including with Western Union to enable cross-border payments; with Family Bank and

28 SIMElab, "Social Media Consumption in Kenya", 2019. https://www.usiu.ac.ke/assets/file/SIMElab_Social_Media_Consumption_in_Kenya_report.pdf

29 Luke Kelly, "Uses of digital technologies in managing and preventing conflict," Knowledge, evidence and learning for development (K4D), last modified May 17, 2019, https://assets.publishing.service.gov.uk/media/5d0cecb640f0b62006e1f4ef/600_ICTs_in_conflict.pdf

30 See Nanjala Nyabola, "Digital Democracy, Analogue Politics: How the internet era is transforming politics in Kenya," Zed Books, Ltd., (UK), 2018; Lisa Pogialli, "Digital futures and analogue pasts? Citizenship and ethnicity in techno-utopian Kenya," Africa 87, no. 2 (2017): 253-277, http://doi.org/10.1017/S0001972016000942 for deeper analysis of the connections of technology and politics in Kenya.

31 "M-Pesa helps drive up Kenyans' access to financial services - study," Reuters, last modified April 3, 2019, https://www.reuters.com/article/kenya-banking/M-Pesa-helps-drive-up-kenyans-access-to-financial-services-study-idUSL8N21L2HK

32 Oliver Rowntree, "Connected Women: The Mobile Gender Gap Report 2019," GSMA, last modified February 2019. https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2019/02/GSMA-The-Mobile-Gender-Gap-Report-2019.pdf

33 Tavneet Suri and William Jack, "The long-run poverty and gender impacts of mobile money," Science 354, no. 6317 (2016):1288-1292. Note: the effect was greatest in female-headed households.

SimbaPay to enable M-Pesa customers transfer funds over WeChat; and with PayPal and TransferTo to enable transfers with PayPal.[34]

This rapid adoption signaled a willingness among the Kenyan public to embrace new technologies, and the wide uptake of the platform allowed other technology firms to build and innovate on top of it. M-Pesa's growth facilitated new entrants into Kenya's mobile money market, such as Airtel Money and Telkom's T-Kash. An interoperability layer was introduced in April 2018 that enables subscribers to send and receive money across operators with no added charge. From July to September 2019, the value of M-Pesa mobile commerce transactions was more than 1.6 trillion KES (14.9 trillion USD), over 800 percent the value of their next largest competitor's (Airtel Money) transactions at 1.97 billion KES.[35] The swift rise of Safaricom's M-Pesa and its spillover effects have helped position Kenya as a leader in technological innovations within East Africa and in sub-Saharan Africa more broadly.

2.1.6 SILICON SAVANNAH'S RICH INNOVATION CULTURE

Kenya's startup sector is one of the most robust on the continent. Nairobi's reputation as a vibrant hub for tech entrepreneurs has attracted forward-thinking innovators and investors from around the world. The creation of iHub (one of Nairobi's first tech hubs and co-working spaces) paved the way for other tech hubs, such as Nailab, Nairobi Garage, and SwahiliBox in Nairobi and beyond. This has in turn spurred the growth of startups and accelerators, with nearly 40 startup incubators and accelerators currently in operation in greater Nairobi, each with more than 30 startups.[36]

Kenyan startups such as CarePay, Twiga Foods, Tulaa, FarmDrive, Apollo Agriculture, and others have demonstrated how digitally anchored business models can provide scalable revenue and job creation opportunities while maintaining sustainable growth in the digital ecosystem. At the same time, a number of startups are trying to use technology to address Kenya's youth unemployment problem, a major issue facing Kenya today. For example, companies such as Andela and Lynk are utilizing digital platforms to connect the local workforce with contract or "gig" opportunities. Another notable segment of Kenya's tech sector has been solar home system (SHS)

BOX 2: The Potential of E-Commerce

Although it currently represents less than one percent of digital transactions across Africa, the GoK has strong expectations regarding e-commerce as a high-growth area. Once considered an impossible market to break into due to logistical hurdles, pioneers such as Jumia are paving the way. That company completes transactions every two seconds, and has more than 100,000 sellers across Africa. As per an interviewee, Jumia has partnered with Posta for local pick-up stations to serve last-mile customers, and 25 percent of their customers live in rural areas. However, the majority of Jumia's customer payments are still cash-on-delivery. Many challenges remain for significant e-commerce uptake, such as customer education and buy-in to the delivery model, concerns around product quality, customer preference for paying cash on delivery, the risk that the recent digital economy tax may discourage consumer use of online platforms, and ongoing logistical challenges that make e-commerce a high potential but far from seamless process.

34 Francesco Pasti, "State of the Industry Report on Mobile Money," accessed March 26, 2020, https://www.gsma.com/r/wp-content/uploads/2019/05/GSMA-State-of-the-Industry-Report-on-Mobile-Money-2018-1.pdf

35 "First Quarter Sector Statistics Report for the Financial Year 2019/2020 (July - September 2019)," Communications Authority of Kenya," accessed March 15, 2020, https://ca.go.ke/wp-content/uploads/2019/12/Sector-Statistics-Report-Q1-2019-2020.pdf

36 "Kenya's Economic Update - Securing Future Growth: Policies to Support Kenya's Digital Transformation," The World Bank. Edition No. 20, last modified October 2019, https://documents.worldbank.org/en/publication/documents-reports/documentdetail/968481572468094731/kenya-economic-update-securing-future-growth-policies-to-support-kenya-s-digital-transformation

distribution, with pay-as-you-go (PAYG) technology driving Kenya's market growth as a leader in energy access for rural households and small businesses. The SHS sector has attracted a diversity of active startups such as M-KOPA, d-Light, Fenix, BBOXX, and Barefoot Power, and represents innovation regarding energy, connectivity, and digital financial services (DFS), with SHS packages including solar-powered smartphones, TVs, WiFi hotspots, and appliances.

Kenya's successes in the tech sector have also encouraged U.S.- and EU-based investors and multinational tech firms to invest in Kenya as an entry point to the East African market. Companies such as IBM and Microsoft brought their operations to Kenya and created workforce development programs to train aspiring engineers for employment. As the local market for digital business grows, several interviewees noted an opportunity to encourage new entrepreneurs and employees to develop market-based solutions to Kenya's complex social and development challenges.

2.2 CHALLENGES IN KENYA'S DIGITAL ECOSYSTEM

Despite the many strengths of Kenya's digital ecosystem, the DECA also identified numerous challenges, grouped below into three broad themes: overcoming barriers to effective engagement in the digital ecosystem, protecting individuals and organizations from digital harm, and leveraging the digital ecosystem for inclusive economic growth.

2.2.1. OVERCOMING BARRIERS TO EFFECTIVE ENGAGEMENT IN THE DIGITAL ECOSYSTEM

Despite Nairobi's innovative tech community and the widespread adoption of M-Pesa throughout Kenya, not all Kenyans have equal access to digital tools and services. Women, youth, poor, and rural populations often face several co-occurring challenges with respect to Internet access and use—from inadequate infrastructure, prohibitive data costs, and limited access to relevant digital content, to adverse social norms and low digital skills.

LOW CONNECTIVITY FOR THE "LAST-MILE"

Despite Kenya's high mobile coverage rates, people living in rural areas typically lack access to fast, reliable coverage.[37] While multiple providers often service urban or peri-urban population centers, rural areas are generally served by a single fiber provider, if they are served at all. This tends to lead to less competition and less reliable service.[38] Private companies do not typically prioritize the needs of last- mile populations because of the additional costs of and difficulties with working in remote communities, even if those towers could be commercially viable. While Kenya does have a Universal Service Fund (USF) to address the lack of physical ICT infrastructure in rural areas, this model has inherent limitations: as noted by interviewees, very few companies have access to USF funds, and it can be unclear how USF funds are used. The Communications Authority has reported USF levies collection since March 2015,[39] with unspent funds estimated at over $42 million.[40] Management and disbursement is largely unknown across the industry. An absence of complementary infrastructure, such as reliable access to electricity, can also hinder Internet expansion. As one interviewee said, "Who will build 4G (or 5G) in a place that has no electricity?"

37 World Economic Forum, "Global Competitiveness Report 2019," 2019. See p. 318-321 on Kenya's global ranking for ICT adoption, http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf

38 The World Bank, "Kenya's Economic Update," 2019

39 Communications Authority of Kenya, "Universal Service Fund (USF) Framework," 2018, accessed May 15, 2020, https://ca.go.ke/wp-content/uploads/2018/02/Universal-Service-Fund-Framework.pdf

40 Alliance for Affordable Internet, "Using Universal Service and Access Funds: An Untapped Resource to Close the Gender Digital Divide," 2018, https://webfoundation.org/docs/2018/03/Using-USAFs-to-Close-the-Gender-Digital-Divide-in-Africa.pdf

One interviewee noted particular challenges around Kenya's high level of public infrastructure development (e.g. roads), which disrupts previously laid fiber and requires significant investment to replace, only a fraction of which is reimbursed to the companies. There is also anecdotal evidence of inefficiencies in infrastructure development. For example, Constituency Innovation Hubs (CIHs)—a 2017 GoK initiative to bring technology centers with free Internet and digital devices to all 290 constituencies in Kenya—are mandated to use VSAT satellite technology, regardless of their location.[41] This may be unnecessary in locations such as Nairobi, where fiber infrastructure exists and provides much faster Internet speeds.

Extending connectivity and digital inclusion in Kenya will also require navigating global power dynamics. Donors and other development actors will need to be vigilant and coordinated in supporting GoK to explore alternatives to problematic technology investments, and ensure the expansion of digital infrastructure in Kenya is consistent with the goal of strengthening country self-reliance and supporting open, secure, and inclusive Internet access.

PROHIBITIVE COST OF DATA

The Alliance for Affordable Internet (A4AI) ranks Kenya 37th of 61 countries in terms of affordability of Internet access.[42] As of 2017, Kenya's mobile broadband data costs stood at 1 GB for 4.01 percent of the Gross National Income (GNI per capita),[43] almost twice A4A1's benchmark of 1 GB of mobile broadband data available for 2 percent or less of GNI per capita.[44] High taxes, mostly borne by the consumers, often make the cost of data even more expensive. While several private sector-oriented interviewees noted that the cost of data is steadily decreasing, other stakeholders continue to identify affordability as a key issue inhibiting Internet access and use in Kenya. For example, one interviewee noted that a rural public school might reasonably be able to afford connectivity for less than 5,000 KES/month, yet local MNOs typically package 5 Mbps at 15,000 KES, and have little incentive to develop packages, or even bundles that are affordable in that context.

Kenyan youth are especially affected by this issue, particularly because their incomes can be quite low. Interviewees highlighted that youth are less likely to consume data-heavy content (e.g., video) and have many strategies to stretch data bundles, such as checking social media or WhatsApp at fixed times rather than running apps continuously. When asked during data polling why respondents use their preferred SIM card the most, younger age groups were more likely than older age groups to cite cheaper pricing as a major reason.[45] Project Rubicon I (Box 1) has demonstrated that lowering the cost of this data can help a greater number of youth get online and still generate profit.

41 The Government of Kenya. Constituency Innovation Hubs Agreement. (2017), accessed March 19, 2020

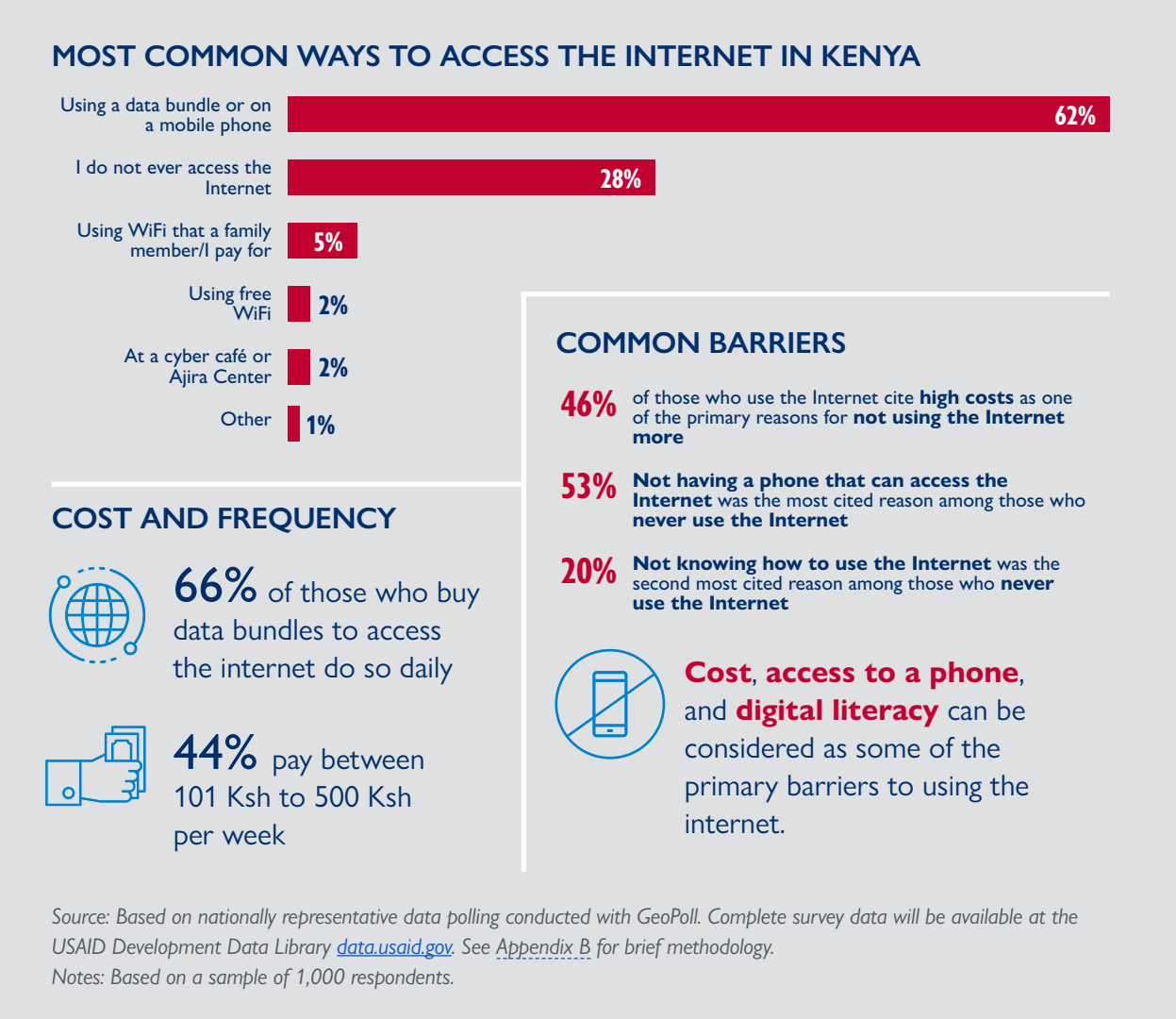
42 Teddy Woodhouse and Calum Cameron, "Affordability Report 2019," Alliance for Affordable Internet (A4AI), last modified 2019, https://1e8q3q16vyc81g8l3h3md6q5f5e-wpengine.netdna-ssl.com/wp-content/uploads/2019/10/A4AI_2019_AR_Screen_AW.pdf

43 "Mobile Broadband Data Costs," A4AI, last modified January 2019, https://a4ai.org/mobile-broadband-pricing-data/

44 "UN Broadband Commission Adopts A4AI "'1 for 2' Affordability Target," A4AI, last modified January 23, 2018, https://a4ai.org/un-broadband-commission-adopts-a4ai-1-for-2-affordability-target/

45 Based on nationally representative data polling conducted with GeoPoll. Complete survey data will be available at the USAID Development Data Library data.usaid.gov. See Appendix B for brief methodology.

FIGURE 2: Accessing the Internet - GeoPoll Results



Source: Based on nationally representative data polling conducted with GeoPoll. Complete survey data will be available at the USAID Development Data Library data.usaid.gov. See Appendix B for brief methodology.
Notes: Based on a sample of 1,000 respondents.

LACK OF LOCALLY RELEVANT DIGITAL CONTENT

Kenya scores only 41.3 (out of 100) with respect to the amount of locally relevant content developed, according to GSMA's Mobile Connectivity Index.[46] Several interviewees noted that some Kenyans—particularly people in rural areas, older people, and women—may not use the Internet because there is little digital content available that they perceive to be relevant to their daily lives. As Box 3 highlights, access to the Internet does not necessarily change a person's behavior or spur new interests. This is reinforced by polling results: when asked how their Internet use would change if they had a smartphone with unlimited data, 45 percent of respondents stated they would spend more time on social networks, and 40 percent stated they would do more of what they do now.[47]

46 "Kenya | Detail and Analysis, Index Score 2018," GSMA Mobile Connectivity Index, accessed March 12, 2020, https://www.mobileconnectivityindex.com/#year=2018&zoneIsocode=KEN&analysisView=KEN

47 Based on nationally representative data polling conducted with GeoPoll. Complete survey data will be available at the USAID Development Data Library data.usaid.gov. See Appendix B for brief methodology.

BOX 3: Relevant Content: The Power of Relatable Messaging to Drive Positive Social Change

Well Told Story, now Shujaaz Inc.,[1] has kept its key target audience—youth—at the center of its business model to create and disseminate relevant content that they can identify with. This is done in order to inspire and encourage them to aspire for opportunities and goals that they might have previously felt unattainable. As a Shujaaz client with the power of the Internet at her fingers claimed, "I feel like I've been to Dubai."

The Kenyan company has an active follower base of 7.5 million youth in Kenya (56 percent of total youth) and Tanzania (15 percent of total youth). It empowers youth through rigorous research, media, and branding through fun, relatable content. The company initiated its work through analog forms of media (comic and radio), but has been adding new digital media (social media and SMS) as its customers increasingly gain access to the Internet.

Studies have found positive associations between Shujaaz users and family planning, and income-generating outcomes. A study by Tulane University demonstrated that youth who engage with Shujaaz digital media platforms are likely to earn 21 USD (2,096 KES) more per month than youth who do not, controlling for age, gender, education, and economic status. Exposure to both analog and digital media with Shujaaz content was associated with improved income-generating outcomes among fans. The study also found that young people who are users of Shujaaz's analog programs for more than a year are also more likely to believe that family planning is important (43 percent increase in the use of contraceptives by fans); more likely to recommend the use of contraceptives to others; and more likely to have conversations about those issues with adults.[2] Similar to the aforementioned study, another study by researchers at the University of North Carolina found that urban teenage girls (ages 15-19) engaging with Shujaaz platforms were 2.4 times more likely to delay childbirth, and 2.7 times less likely to marry in their teens compared to non-Shujaaz audience.[3]

Photo credit: USAID/Riccardo Gangale

Shujaaz recognizes that the behavior change cannot happen all at once, and achieves positive social change through incremental steps: highlighting relevant stories through analog forms of media, dispelling myths and misconceptions through the same means, and finally using digital media or offline events to mediate discussion with peers and advisors. As an interviewee noted, access to the Internet will not necessarily change a person's behavior or interests. In other words, many youth will use online platforms to do more of what they do offline—chat with friends, follow sports channels, and gamble— which will always be more popular than online banking or research. However, access to an Internet with relatable content is transformative in how youth feel about themselves, and as the numbers show, can affect confidence, personal development, and behavior.

Sources: Key informant interviews with Well Told Story (Shujaaz Inc.) and Mawingu Networks.

[1] https://www.shujaazinc.com/goodbye-well-told-story-hello-shujaaz-inc-a-letter-from-our-ceo/

[2] Paul Hutchinson, Anastasia Mirzoyants, and Alejandra Leyton. "Empowering youth for social change through the Shujaaz multimedia platform in Kenya." International Journal of Adolescence and Youth 24, no. 1 (2019): 102-116, https://www.tandfonline.com/doi/pdf/10.1080/02673843.2018.1475287

[3] Ilene S. Speizer, Lisa M. Calhoun, and David K. Guilkey. "Reaching urban female adolescents at key points of sexual and reproductive health transitions: Evidence from a longitudinal study from Kenya." African Journal of Reproductive Health 22, no. 1 (2018): 47-59; "The research behind our impact numbers." Shujaaz Inc. blog. Last modified March 5, 2020, https://www.shujaazinc.com/the-research-behind-our-impact-numbers/

LACK OF DIGITAL SKILLS AND LITERACY

Many interviewees identified the importance of building digital skills to promote increased technology use, which is also a key focus of the GoK, private sector actors, and donors. For example, one interviewee noted that education officials in the Tusome early grade reading program only felt comfortable using tablets with hands-on support, pointing to the need for digital literacy training when new digital devices are introduced.

This may range from very basic digital skills such as using a device and password protection to more advanced topics such as cybersecurity, cyber hygiene, and data management, consistent with a range of competencies associated with digital literacy.[48]

In an effort to strengthen digital skills, Kiambu County previously partnered with organizations such as the African Centre for Women in ICT, Jomo Kenyatta University, and Oracle to provide training packages at the county Technical and Vocational Education and Training (TVET) centers. While TVETs offer some training to youths seeking digital skills, one interviewee noted challenges including the lack of adequate digital infrastructure and tools, varying levels of support from county-level leadership, and a negative community perception of TVETs. A few interviewees indicated that some people and organizations may view technology as a threat to their job security or may not see the value in digital content, which reduces the likelihood that they will develop their own digital skills.

Many interviewees recognized a need to raise awareness about "cyber hygiene" and the importance of protecting personal information online as one facet of digital literacy. Polling results revealed that only 27 percent of respondents said they would not feel comfortable sharing their personal data with anyone, indicating most Kenyans are comfortable sharing personal data to some degree.[49] Several digital skills programs offered at Ajira Centers

BOX 4: Programs Promoting Digital Literacy in Kenya

Examples of efforts to promote digital literacy in Kenya include:

- **The Digital Literacy Programme (DigiSchool)** is a GoK program initiated in 2016 to use digital devices in Kenyan public schools in order to prepare young people for the digital world. During Phase 1, more than 1 million devices were installed in public primary schools across the country, with more than 100,000 devices assembled locally in Kenya. The next two phases will emphasize using digital devices to teach content and ultimately to use technology to facilitate the creation of employment opportunities.
- **The Ajira Digital Program** is a GoK initiative driven by the Ministry of ICT, Innovation, and Youth Affairs (MoICT) in collaboration with the Ministry of Public Service, Youth, and Gender affairs to train young people in digital skills, help them access digital job opportunities, and provide a physical place with access to the Internet. The online mentorship platform and curriculum has reached more than 1 million students. In 2019, however, the GoK announced plans to charge youth registered in the program a registration fee of 10,000 KES (93 USD) in lieu of income tax to fund the program.
- **The Kenya School of Internet Governance (KeSIG)** is a KICTAnet initiative to enhance local knowledge of and capacity in Internet governance. The three-day intensive training targets Kenyans from all sectors—government, academia, tech community, and civil society actors—and covers topics including Kenya's Internet governance policy/legal framework, Internet governance issues, digitalization, and digital rights in Kenya and Africa at large.

Sources: KI interviews; "DigiSchool - Implementation," ICT Authority, accessed March 12, 2020, http://icta.go.ke/digischool/implementation/; "Ajira Digital," accessed March 12, 2020, https://ajiradigital.go.ke/home; Kiruti Itimu, "New Treasury Proposal Shows Ajira Program Wasn't About Creating Jobs," last modified June 13, 2019, https://techweez.com/2019/06/13/ajira-program-tax/; "Kenya School of Internet Governance," Kenya Internet Governance Forum, accessed June 25, 2020, https://kigf.or.ke/kesig/#:~:text=The%20school%20targets%20Kenyans%20from,new%20to%20Internet%20Governance%20issues.&text=KeSIG%20is%20convened%20by%20Kenya,in%20ICT%20policy%20and%20regulation

48 See page 17 (Figure 1) for key areas of digital literacy and relevant competencies in Fabio Nascimbeni, and Steven Vosloo, "Digital Literacy for Children: Exploring definitions and frameworks," UNICEF, last modified August 2019, https://drive.google.com/file/d/11FCv6s9byn_c0LtQOqxeJMCKchz-XLMS/view

49 Note that women were less likely than men to report they would share personal data with social media companies, while younger age groups were more likely to share data with anyone as opposed to older age groups. Based on nationally representative data polling conducted with GeoPoll. Complete survey data will be available at the USAID Development Data Library data.usaid.gov. See Appendix B for brief methodology.

contain modules on topics like safeguarding your online data, responsible use of social media, and the importance of password protection. Though local understanding of these issues is growing in part due to programs like the Ajira Digital Programme, overall awareness of data privacy issues remains low at the individual level.

ADVERSE SOCIAL NORMS LIMITING ACCESS FOR WOMEN

Social norms around mobile phone access and use may affect how different groups—particularly women—interact with digital technology. Especially in rural areas, women and girls may not feel comfortable or confident, or that it is socially acceptable to use technology. GeoPoll results from a national survey showed that of those who never access the Internet, nearly 68 percent were female. Polling results also indicate that a higher percentage of women would be comfortable going to the village chief in-person to express opinions and requests for government services (45 percent women; 30 percent men) whereas men were more likely to be comfortable doing so via social media (37 percent women; 58 percent men).[50] These norms also affect women's behavior and engagement with digital devices. In a recent GSMA survey, respondents were asked 28 questions about how they used their mobile phones, ranging from simple functions like sending SMS and making calls to more advanced functions like watching videos online. On average, men in Kenya mentioned using six functions (of a possible ten) for their mobile phones, while women used only four.[51]

The African Centre for Women, Information, and Communications Technology (ACWICT) noted that they sometimes have trouble recruiting women into their programs, so they have to go through local systems and networks, government systems, community-based organizations, and county communications systems just to identify potential participants. This mirrors Project Rubicon's finding that girls participated in screenings of digital content and increased their use of digital platforms when they were "invited" to do so. These norms also affect the policy environment in which women work. For example, many organizations do not have policies on gender-based violence in the workplace because it is not deemed as a problem.

2.2.2 PROTECTING INDIVIDUALS AND ORGANIZATIONS FROM DIGITAL HARM

As Kenya's digital ecosystem matures, new risks arise related to the use of the Internet and digital systems to store and share information. Referred to here under the umbrella term "digital harm," these risks stem from challenges of safeguarding personal information, to widespread misinformation, to predatory online lending practices.

SAFEGUARDING PERSONAL INFORMATION

Personally identifiable information (PII) and identity data are widely sought and shared within Kenya. Identity information is shared for SIM registration; M-Pesa users are routinely sharing personal and financial transactions data with Safaricom; increasing numbers of Kenyans are sharing information about themselves on social media; and PII is shared at nearly every business entrance. With Kenyan's online presence growing, the volume of personal and sensitive information flowing across government databases, social media accounts, and financial institutions' digital platforms has increased, and so has its vulnerability.

According to statistics published by the Communications Authority of Kenya, the number of cyber threats detected in Kenya rose over 500 percent in a single year, from 3.8 million between July-September 2018 to

50 Based on nationally representative data polling conducted with GeoPoll. Complete survey data will be available at the USAID Development Data Library data.usaid.gov. See Appendix B for brief methodology.

51 Oliver Rowntree and Matthew Shanahan, "Connected Women: The Mobile Gender Gap Report 2020," GSMA, last modified March 2020, https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2020/02/GSMA-The-Mobile-Gender-Gap-Report-2020.pdf

25.2 million during the same period in 2019 (see Table 1). High-profile hacks in 2019 alone include the GoK's Integrated Financial Management System (IFMIS), Absa Bank (formerly Barclays Bank), and President Uhuru Kenyatta's Facebook and Twitter pages. As a result, strengthening cybersecurity is a priority in high level GoK strategy documents, including the Draft National ICT Infrastructure Master Plan 2019-2029 and the 2019 Digital Economy Blueprint.

TABLE 1. Cyber Threats Detected 2018-2019

	Jul – Sep 2018	Oct – Dec 2018	Jan – Mar 2019	Apr – Jun 2019	Jul – Sep 2019
Total	3,823,714	10,221,033	11,253,311	26,604,202	25,211,269

Source: Table adapted from the Communications Authority of Kenya's Fourth Quarter Sector Statistics Report for the Financial Year 2018/2019 (April – June 2019) and First Quarter Sector Statistics Report for the Financial Year 2019/2020 (July – September 2019), https://ca.go.ke/wp-content/uploads/2019/09/Sector-Statistics-Report-Q4-2018-19.pdf and https://ca.go.ke/wp-content/uploads/2019/12/Sector-Statistics-Report-Q1-2019-2020.pdf.

Kenya has taken multiple steps to address the growing threat of cybercrime. The passage of the 2018 Computer and Cybercrimes Act created a legal framework around cybercrimes, yet it is unclear how it will be implemented and enforced. GoK roles and responsibilities around cybersecurity remain unclear and tend to overlap, with the Communications Authority of Kenya, Central Bank of Kenya, Ministry of the Interior, and MoICT all working on cybersecurity issues. While the MoICT runs the National Cybersecurity Steering Committee, several interviewees described seeing little coordination on the ground among GoK agencies and actors. This has the potential to compromise efforts to combat cyberattacks and address other cybersecurity concerns. Further, there is a critical gap in technical expertise to protect against cyber threats. Kenya has only 1,700 cybersecurity professionals in the entire country.[52]

Kenya is supporting systems to continue to collect personal information and store it digitally. The recently introduced *Huduma Namba* national digital identity system initially set out to collect identity information including DNA samples and GPS coordinates of individual houses. These details were later prohibited by a recent Supreme Court decision, and the rollout of the program was halted until a data protection framework could be put in place.[53] The Privacy Act, passed in November 2019, is poised to enact protections like those of Europe's General Data Protection Regulations (GDPR), yet there remain significant concerns about implementation. For instance, the Privacy Act requires that only registered data controllers handle personal information, but the feasibility of this remains unclear in a country where personal information is so widely shared. While the passage of formal privacy protections is an important step forward, the process raised concerns about the integrity of public participation in policymaking.

INFORMATION INTEGRITY ONLINE

Mirroring the global rise of "fake news," misinformation and disinformation campaigns are growing in size and prominence in Kenya, particularly in the political sphere. As digital literacy in Kenya remains relatively low, viewers may not possess the skills to distinguish authentic news articles from disinformation, and this capacity to influence public opinion poses a significant threat on multiple levels to the strength of Kenya's democratic processes. Misinformation and disinformation on digital platforms had a significant role in Kenya's 2017 presidential elections.

52 "Africa Cyber Security Skills Gap Report 2018," Serianu, accessed March 31, 2020, https://www.serianu.com/downloads/KenyaCyberSecurityReport2018.pdf

53 "Huduma Namba: Kenya court halts biometric ID over data fears," BBC News, last modified January 31, 2020, https://www.bbc.com/news/world-africa-51324954.

Misleading, heavily biased, and sensationalist information was widely shared on platforms like Facebook, Twitter, and WhatsApp. In a nationally representative SMS survey conducted in May 2017 (four months before the first round of elections), nearly 90 percent of respondents reported seeing information about the election that they thought was intentionally false.[54]

Misinformation and disinformation continue to grow. A recent online survey of 600 Kenyans showed that over 80 percent of respondents believe that they often or sometimes see online news stories about politics and government that are made up,[55] similar to GeoPoll survey results from several years earlier.[56] A few interviewees from politically oriented CSOs reported that their organizations had found fake content branded to look like it had come from them in a deliberate effort to mislead the public, including parliamentary watchdog group Mzalendo. Several organizations such as AfricaCheck and PesaCheck have emerged to fact-check popular news stories as they arise, indicating local and regional civil society actors recognize the need to address and counter this growing trend.

An added complexity in the rise of misinformation and disinformation is the state of Internet freedom, and the extent to which individuals can freely express content online. Limitations on online expression can create conditions in which misinformation goes unquestioned, and it is easier to censor content that those in power dislike. Kenya is classified as "partly free" in Freedom House's 2019 *Freedom on the Internet* report. While not as restrictive as other countries in the region, interviewees working in this space pointed to several concerning trends, including increasing content regulation, especially targeting LGBT-related content, and gaps in journalistic protections under new privacy frameworks. Some bloggers and journalists report intimidation tactics in response to unfavorable coverage.

Concerns exist that legislation framed as protecting individuals could be used to silence bloggers and online activists—in particular the Computer Misuse and Cybercrimes Act, which criminalizes acts of false information, and hate speech, with little definition of what qualifies. BAKE raised concerns about the potential for the Act to infringe on fundamental freedoms of expression, and like the Privacy Act itself, to circumvent public participation; the High Court recently rejected the claims to allow the Act to move forward.[57]

PROTECTING CONSUMERS ENGAGED IN DIGITAL LENDING

Digital lending has proliferated in Kenya since the launch of M-Shwari[58] in 2012, with digital loans nearly doubling from 2016 to 2018. Though over 90 percent of Kenya's digital loans are made by MNOs and/or banks/microfinance institutions (MFIs), nearly 50 FinTechs have entered the Kenyan market in the past five years to capitalize on this growing market.[59] Eighty-six percent of loans taken out by Kenyans over the past two years have been digital.

54 "The reality of fake news in Kenya," Portland and GeoPoll, accessed March 12, 2020, https://cdn2.hubspot.net/hubfs/325431/The-Reality-of-Fake-News-in-Kenya%20-%20FINAL.pdf?t=1502723966924

55 Herman Wasserman, and Dani Madrid-Morales, "'Fake News' Disinformation, and Media Trust in Africa: An exploratory study of Kenya, Nigeria, and South Africa," last modified May 27, 2019, https://www.danimadrid.net/research/2019_fake_news_disinformation_media_trust_kenya_nigeria_south_africa.pdf

56 "The Reality of Fake News in Kenya," Portland and GeoPoll.

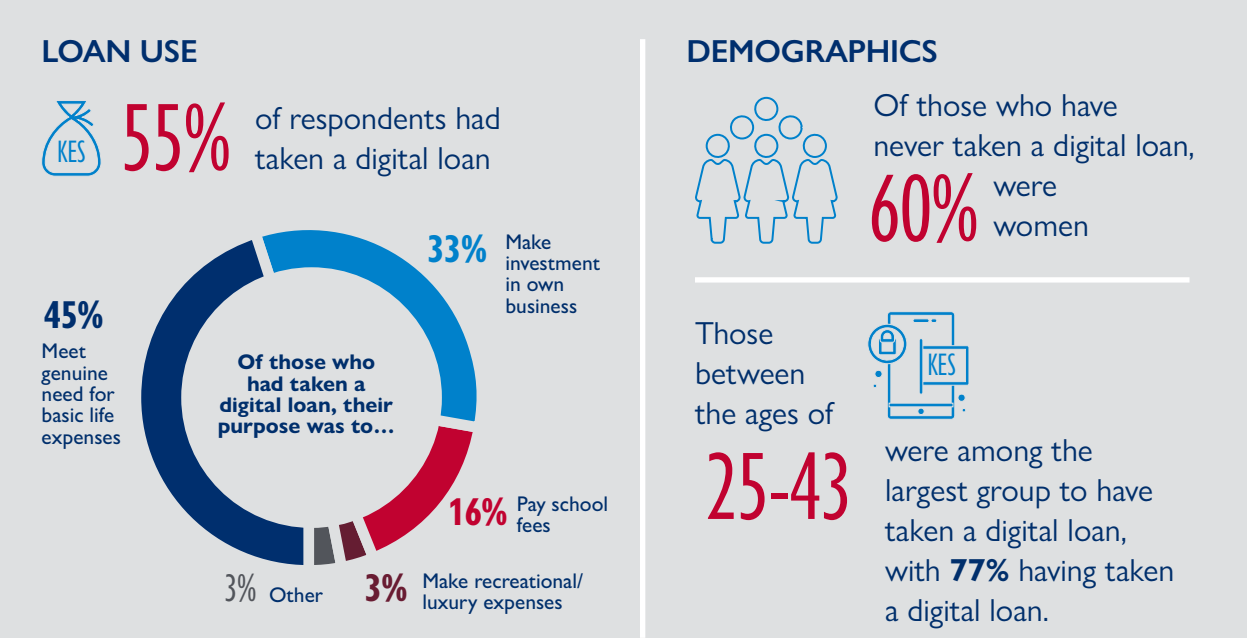
57 "Republic of Kenya. In the High Court of Kenya at Nairobi, Milimani Law Courts Constitutional and Human Rights Division. Constitutional Petition No. 206 of 2018," Bloggers Association of Kenya (BAKE), 2018, https://www.blog.bake.co.ke/wp-content/uploads/2018/05/BAKE-petition-Cybercrimes-act.pdf

58 M-Shwari is a mobile savings and loan platform established by Commercial Bank of Africa (CBA) in Kenya.

59 "Making Digital Credit Truly Responsible," Microsave, 2019, https://www.microsave.net/wp-content/uploads/2019/09/Digital-Credit-Kenya-Final-report.pdf

However, even though there is strong demand for digital loans in Kenya, 2.2 million Kenyans currently have defaulted on digital loans taken out over the past two years. About half (49 percent) of these digital credit borrowers with non-performing loans have outstanding balances of less than USD 10, but they are blacklisted from Kenyan banks nonetheless.[60] Millions of mobile money users lack adequate regulation to guard against fraud, identity theft, predatory lending, and illegal activity via online platforms.

FIGURE 3. Digital Loans — GeoPoll Results



Source: Based on nationally representative data polling conducted with GeoPoll. Complete survey data will be available at the USAID Development Data Library data.usaid.gov. See Appendix B for brief methodology.
Notes: Based on a sample of 1,000 respondents. 43 percent had never taken a loan, 2 percent responded "Don't know" - neither are included here.

This stems from both supply and demand-side issues. On the supply side, Kenya has no consumer protection laws or regulations covering the entire digital credit market (including FinTechs). As a result, some digital lenders employ unsavory business practices, including high interest rates and fees, non-transparent or unclear terms of service, SMS push ads with no opt-out mechanism, and, according to interviewees, even calling or messaging people on borrowers' contact lists about a borrower's non-repayment status. Even for digital loan recipients with legitimate complaints, there are very few, if any, recourse mechanisms such as arbitration.

On the demand side, consumers possess a low level of awareness and savvy around digital credit products. According to one interviewee, many people defaulted on very small M-Shwari loans shortly after its 2012 launch, not because they did not have funds, but because they did not take the debt seriously. Geopoll data revealed that among those who had taken a digital loan, 45 percent of respondents had been late on paying back an M-Shwari loan, followed by 23 percent being late to pay back to Tala. Among M-Shwari users specifically, about 45 percent respondents were not able to repay and report still being in default. As digital loans have become more prevalent, the felt consequences of debt and reasons behind default are important to understand. Many consumers may not

60 Ibid

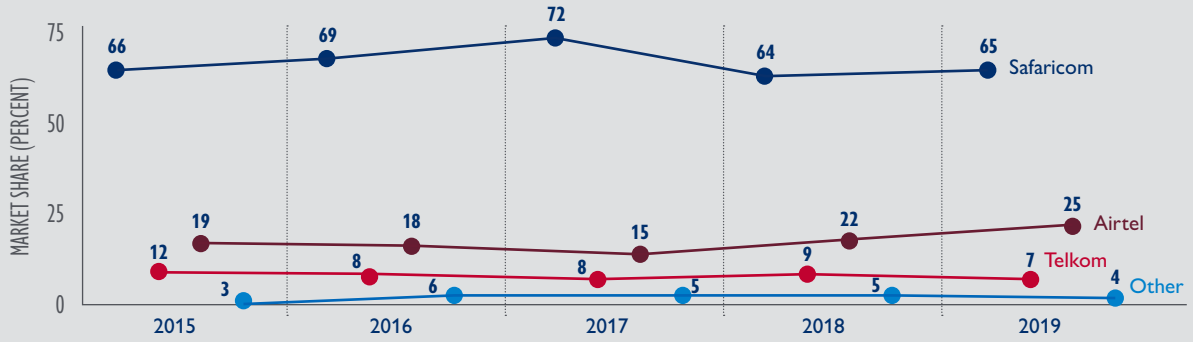
read the terms of service or understand the loan terms (where available). Fraud is also relatively common for the same reason, with reports of consumers being defrauded after providing their PII to callers purporting to be from major companies or banks. Among respondents asked about their experience with loan repayment in GeoPoll's survey, 33 percent claimed to be surprised by what happened to them — whether it was the size of the fees they had to pay (59 percent), the timeframe to pay it back (30 percent), or the inability to get a future loan (28 percent), among others.[61] Taken together, this leads to a lack of trust among Kenyan consumers within the digital credit marketplace.

In summary, the collection of PII within Kenya is rapidly increasing, but there are unproven legal frameworks governing how this data can be collected, stored, and used. The lack of legal protections allows companies to take advantage of users, particularly in the digital lending sector. At the same time, users—especially those who are new to the digital realm—may not understand the importance of protecting their digital footprint and PII, rendering them increasingly vulnerable to cybercrime, mis/disinformation campaigns on social media, and exploitative companies. Without sufficient employment and economic opportunities for the growing youth population, this threat will likely only increase.

2.2.3 LEVERAGING THE DIGITAL ECOSYSTEM FOR INCLUSIVE ECONOMIC GROWTH

While the GoK sees the digital economy as a means to grow Kenya's economic base and increase international trade, the landscape is currently dominated by one large player—Safaricom—rather than a diverse group of commercial and social enterprises. Continuing on this trajectory may hinder the development of digital services that would serve more diverse market segments. Characterized by unpredictability, increasing taxation, a high level of administrative bureaucracy, and regulatory opacity, the market environment may limit continued innovation, the expansion of local companies, and market entry for international tech companies.

FIGURE 4. MNO Market Shares 2015-2019



Source: Communications Authority of Kenya - Sector Statistics Report Q1 (for years 2015-2019)
Note: Telkom was previously Orange prior to 2016. 'Other' mostly constitutes of FinServe (Equitel) shares.

61 Other responses included lender's sharing of the respondent's payment status with their contacts. Based on nationally representative data polling conducted with GeoPoll. Complete survey data will be available at the USAID Development Data Library data.usaid.gov. See Appendix B for brief methodology.

Safaricom Market Dominance Increases Market Concentration and Restricts Innovation

Safaricom's growth was a significant driver of early innovation in Kenya's digital ecosystem, yet now functions as a dominant player in the ecosystem. Data from Communications Authority of Kenya[62] (Figure 4) indicates that Safaricom has consistently held more than two-thirds of the market share of mobile subscriptions over the last five years. GeoPoll results confirmed Safaricom's dominance, with 88 percent of respondents indicating that they use Safaricom SIM cards most frequently. On average, the top five reasons for this preference were: better coverage (66 percent), well-known brand (37 percent), mobile money use (35 percent), and used by friends and family (35 percent), and greater affordability (31 percent).[63]

Many digital payment services—including those of the GoK—rely on Safaricom's M-Pesa mobile money platform, which has led to Safaricom's place as unparalleled market leader. Because of its singular influence on Kenya's digital economy (in large part due to M-Pesa's ubiquity), any competitors in the MNO or the mobile money space face serious challenges in growing their market share. Several interviewees raised concerns that Safaricom is making the playing field especially difficult for young innovators, buying out new innovations but not deploying them or requesting prohibitively high equity shares in business partnerships.

KENYA'S "SILICON SAVANNAH" FACES AN UPHILL BATTLE

Despite the famously innovative and entrepreneurial culture of Nairobi's Silicon Savannah, few Kenyan startups have matured and scaled. Startups face uncertainties in regulatory policy, shortages of affordable financing, limited market reach, and shortages in needed human capital, and often have little experience and business acumen.

Many actors in Kenya's digital marketplace have been challenged by "policy shocks"—the rapid introduction of policy changes. As one interviewee noted, Kenya's 2016 interest rate cap constrained the ability of digital entrepreneurs to access credit from traditional lenders, which is especially critical for a sector with high upfront capital requirements. Even though it intended to increase financial inclusion by clamping down on lending the public perceived to be predatory (i.e. higher interest rates than palatable to the Kenyan public), this policy had the opposite effect. It led to a credit freeze that hit SMEs particularly hard[64] and opened the door to FinTechs, not affiliated with traditional banks or subject to their regulations, to enter the market with very high interest loans.

Several interviewees noted multiple general challenges for younger entrepreneurs, who more often lack the requisite business skills to run a startup. Experience with strategic financial planning is limited, and few have access to legal services for adequate protection of intellectual property. Young entrepreneurs may also lack the maturity to collaborate with others in the space, potentially viewing other startups as competitors and not as potential collaborators. Other interviewees highlighted struggles with opaque and frequently changing requirements for business registration, permitting, and other bureaucratic processes, which can severely hobble or even end nascent businesses.

62 "Sector Statistics Report Q1," Communications Authority of Kenya, 2015-2019, accessed March 4, 2020, https://ca.go.ke/consumers/industry-research-statistics/statistics/

63 Based on nationally representative data polling conducted with GeoPoll. Complete survey data will be available at the USAID Development Data Library data.usaid.gov. See Appendix B for brief methodology.

64 Bilal Zia and Mehnaz Safavian, "To cap or not to cap? What does Kenya's experience tell us about the impact of interest rate caps on the financial sector?," last modified June 25 2018, https://blogs.worldbank.org/allaboutfinance/cap-or-not-cap-what-does-kenya-s-experience-tell-us-about-impact-interest-rate-caps-financial-sector

Further, Kenya's recent Finance Act introduces taxes on digital services that may add a new strain on the digital economy, especially for less-established companies. Intended to be in effect from November 2019, the "digital economy tax" will levy income and value-added tax (VAT) on goods and services provided through digital platforms. Regulations and enforcement mechanisms do not yet exist to implement this tax,[65] though several interviewees feared its introduction could stifle the growth of the digital sector.

Despite efforts from organizations like the Kenya ICT Action Network (KICTANet) and Kenya Private Sector Alliance (KEPSA) to collaborate and advocate, the enabling environment for Kenya's digital economy still largely limits competition, especially for smaller players in the ecosystem. This lack of competition hinders innovation for technologies and digital products that can address local needs at lower costs.

MARKET EXPANSION CONSTRAINTS FOR LOCAL STARTUPS

Startups sometimes develop digital products without strong demand for them among a broad customer base, which limits their utility and growth. Despite the in-country presence of several large technology companies, many Kenyan startups often lack either access to international markets or significant engagement with multinational tech companies within Kenya that would facilitate cross-border business partnerships and access to a broader market.

HUMAN CAPITAL GAPS

Kenya's technology sector has incredible local talent, though the number of employees with highly specialized tech skills remains low. Highly skilled individuals have the incentive to work for larger companies, which pay higher salaries, rather than smaller startups, public organizations, or social enterprises. For those with advanced tech

BOX 5: Encouraging Women and Girls to Engage with Tech

Though Kenya scores higher than many East African countries on GSMA's gender equality index for mobile connectivity, women and girls in Kenya continue to face barriers like adverse social norms and a lack of confidence and skills in accessing and using digital technology. Several organizations are working to address these important issues and promote gender equity in Kenya's digital ecosystem:

- The African Centre for Women, Information, and Communications Technology (ACWICT) trains women and young people in digital skills, soft skills, and vocational skills, then links them to mentors and relevant job opportunities. They work with employers to help ensure that their female employees are given opportunities to work in technical roles, not just administrative work. In addition, ACWICT also encourages in-school adolescent girls to pursue STEM careers and promotes advocacy for gender-responsive ICT policies, laws, and regulations.
- AkiraChix focuses on technical training and mentorship for young women and girls, with the aim of increasing the number of skilled women in the digital space. To date, the organization has had more than 190 graduates, with an 80 percent job placement rate.
- Afchix is a female-led organization focused on building a critical mass of women with computing skills in the workforce. It specializes in mentorship and career guidance for young women seeking careers in computing and ICT.

Sources: KI interviews; "About us," The African Center for Women, Information and Communications Technology (ACWICT), accessed March 16, 2020, https://www.acwict.org/about/; "Impact," AkiraChix, accessed March 16, 2020, https://akirachix.com/; "About us," Afchix, accessed March 28, 2020, http://www.afchix.org/about-us/.

65 Angela Mukora, Nikhil Hira, Denis Magonga, and John Syekei, "What new digital taxes contemplated in the finance act mean for digital trade and services in Kenya," Bowmans, last modified February 20, 2020, https://www.bowmanslaw.com/insights/tax/what-new-digital-taxes-contemplated-in-the-finance-act-mean-for-digital-trade-and-services-in-kenya/

skills who decide to pursue entrepreneurship, many lack business management skills, such as financial planning and human resource management. For the small but growing number of women in the tech field, other barriers exist, including social norms that prioritize caregiving over acquiring digital skills to the risk of increased gender-based violence in the workplace and finding supportive colleagues and mentors. Several initiatives are working to combat these issues and bring more women into the tech field (Box 5).

INVESTOR EXPECTATIONS AND MARKET REALITY MISMATCH

Another factor constraining market growth for startups is a mismatch between investor expectations and the speed at which a startup can absorb capital and create profit. This leaves little opportunity for startups to access affordable financing appropriate for their growth stage. Prioritizing short-term profitability has become common in Kenya. Without an increase of patient capital that provides a longer lead time for investment to return dividends, startups have little time to optimize their business models before their cashflow falters. A culture of innovation is difficult to nurture without investor commitment to business model experimentation.

There is also a gap between investor expectations and the reality of market conditions faced by local Kenyan startups. Local investors appear to prefer investing in more traditional sectors with tangible assets, like real estate, over digital technology startups. Other interviewees noted that investors seem to like investing in companies founded by foreigners or investing in startups that target middle or upper income market segments. In the absence of change, investors may pass by opportunities to invest in local startups that serve those with low income and limited access, who comprise the majority of Kenya's population.

Photo credit: RVDW Images

SECTION THREE

Ecosystem-Level Opportunities & Recommendations

Actors within the development community (both local and international) as well as the private sector have a range of potential channels to both shape and leverage the country's digital ecosystem as it matures. The following recommendations include opportunities for engagement at the ecosystem-level, which are key considerations for the design of any digitally enabled program.

3.1 CONSUMER PROTECTIONS AND CYBER HYGIENE SAFEGUARDS: PROMOTING SAFE AND RESPONSIBLE CITIZEN ENGAGEMENT

With high mobile connectivity and low levels of digital literacy, consumer protection (from misinformation campaigns, predatory lending, identity theft/fraud, and other illegal activity) is of critical importance in Kenya. In order to ensure those engaging in the digital ecosystem can do so safely and responsibly, the international development community can help both using a top-down approach of supporting government and private sector actors in creating an environment with appropriate safeguards, and a bottom-up approach of strengthening digital literacy, digital skills, and cyber hygiene practices to help individuals engage with digital tools, content, and services without harm.

TOP-DOWN CONSUMER PROTECTION SAFEGUARDS

Efforts to support implementation of policy initiatives such as the Data Privacy Act and the Cybercrimes Act could be considered. Furthermore, work could be done to ensure that data protections keep pace with concurrent efforts to digitally collect and store PII, such as through the *Huduma Namba* system. Technical assistance in policy implementation, such as promoting efforts in monitoring and evaluation or supporting independent audits, could facilitate the translation of policy to practice.

Development actors can also support efforts to ensure meaningful public participation in the ICT policy development process. This could include traditional efforts to strengthen civil society and participatory governance mechanisms, as well as more targeted support to advocacy platforms for civil society groups with interests in Internet freedom, digital rights, data privacy, and ICT innovation. Finally, given the recent legal challenges to new laws, efforts to maintain and strengthen the independence of each branch of the national government will be important to ensure robust and fair avenues of redress.

As the GoK develops new capacities in cybersecurity and specific digital skills, the international development community may be in a position to facilitate the delineation of authorities between government bodies and promote coordination through activities such as high-level stakeholder convenings.

With respect to financial consumer protections, there is an opportunity to work with the GoK to develop additional regulatory sandboxes and other pilot programs to test out enhanced "guardrails" for young Kenyan

companies. At the same time, external actors can encourage the business community to take a leadership role in developing industry codes of conduct[66] regarding ethical practices in order to minimize consumer fraud, predatory lending, misinformation campaigns, and other illicit online activities.

BOTTOM-UP DIGITAL SKILL DEVELOPMENT

Strengthening digital literacy across the board, especially for populations newer to online platforms and vulnerable to misinformation, online scams, and predatory lending, will be critical to ensuring everyone can engage digital ecosystems safely. This can be done by making sure that digital literacy and cyber hygiene practices are built into programs that have a digital component, and also by investing in activities that integrate diverse digital skills into existing training programs and initiatives. This includes not only developing basic skills to use and operate digital devices, but raising awareness of how to protect personal information and being critical of online advertising, Private sector engagement (connecting multinationals and market advisory services with local communities when possible) on initiatives that increase digital literacy could be another market-led approach to this end.

3.2 DEEPENING DEVOLUTION THROUGH COUNTY-LEVEL DIGITAL CAPACITY AND LEADERSHIP

County governments require a digitally skilled workforce to conduct their day-to-day operations and facilitate strategic planning and service delivery. Investments in digital capacity, leadership, governance, and institutional workforce are critical, both at the national level and especially as counties are taking on greater leadership through devolution. Building off the GoK's initiatives to integrate the use of geospatial data in county-level planning, the development community could further these aims through targeted technical assistance and skills building within county level governments to enhance the use of digital platforms, communication and feedback systems for evidence-based decision making, and enhanced transparency between county government and constituencies.

Several counties have demonstrated interest in using digital technology. This can be supported by working at the county level to address geographic divides in connectivity, and facilitate cross-county learnings from counties that are leading the way with progressive initiatives and use of digital tools to provide models for others facing similar barriers. Steps could be taken to support initiatives such as *Huduma Mashinani*[67] at the county level to further seamless online access to public services at the grassroots level. GeoPoll survey results indicated that 44 percent of respondents would primarily go to Huduma centers in their county when seeking assistance to access online government services. This indicates that Kenyans generally trust the assistance program, which could further benefit last-mile populations through more frequent availability of *Huduma Mashinani.* The polling also indicated that only 4 percent of the respondents would get help through eCitizen services, indicating there are many challenges to overcome before online service will be the norm for most Kenyans. [68]

66 One example is the Code of Conduct established by the Digital Lenders Association of Kenya (DLAK).

67 Huduma Kenya, "The Huduma Kenya Mobile Outreach Program," nd, https://publicadministration.un.org/unpsa/Portals/0/UNPSA_Submitted_Docs/2018/FC492A28-322F-4A3B-8A28-9A86C7B83213/HUDUMA%20MASHINANI-%20PRESENTATION.pdf?ver=2018-02-09-045353-627; Christopher Tredger, "Kenya's Huduma provides lesson for SA's public sector," The Brainstorm, October 7, 2019, http://www.brainstormmag.co.za/technology/news/14709-kenya-s-huduma-provides-lesson-for-sa-s-public-sector

68 Based on nationally representative data polling conducted with GeoPoll. Complete survey data will be available at the USAID Development Data Library data.usaid.gov. See Appendix B for brief methodology.

Further, there is an opportunity to connect digital skills training for youth, employment opportunities, and county capacity strengthening. In order to address the concurrent challenges of youth unemployment and skilled human capital at the county government level, programs to pair digital skills training with entry level employment opportunities at the county level could be supported. Additional entry points for support include targeted technical assistance in strengthening the county-level business enabling environment and supporting emerging startups to work at the county level, thereby addressing local public service delivery challenges and expanding the Silicon Savannah to other parts of the country.

3.3 PROMOTING DIGITAL INCLUSION: EXPANDING INFRASTRUCTURE, LOWERING DATA COSTS, AND INVESTING IN LOCALIZED, ACCESSIBLE CONTENT

The development community can contribute to, and influence, the growth trajectory of Kenya's digital economy as it relates to digital divides across socioeconomic, gender, and geographic groups. Specific initiatives across sectors targeting last-mile, lower income, and more vulnerable populations (such as youth and refugees) could have a significant impact on increased inclusiveness and accessibility of the digital economy in years to come.

In addition to exploring and supporting a variety of approaches to extending last-mile infrastructure, donors, other international development organizations, and the private sector, can support initiatives to help lower the cost of data and devices, especially in counties outside Nairobi and Mombasa, to lessen a critical bottleneck to greater inclusion. For practical guidance on aggregating telecom demand across GoK's implementing partners to obtain improved service in currently underserved areas and negotiate better price and service levels, please refer to "Better Connectivity, Better Programs: How to Implement a Broadband Demand Aggregation Program." Developing localized content (translated into local dialect beyond English and Swahili when necessary) with private sector and civil society partners (engaging county-level leadership and digital champions across the GoK whenever possible) could also help increase public interest and uptake through better understanding of the specific needs, motivations, and barriers faced by specific segments of the population. A **gender lens approach** to all digitally focused programming could also help reduce the divide women often face.

3.4 STRENGTHENING KENYA'S SILICON SAVANNAH AND MOBILIZING PRIVATE CAPITAL FOR STRONGER ECONOMIC GROWTH

The international development community can leverage their various resources and strengths to support Kenya's growing startup community, and could support the local ICT sector to advance development outcomes through Kenyan-owned and -operated enterprises. This could involve helping to cultivate a favorable enabling environment for Kenya's ICT sector. In addition to supporting the GoK in policy and regulatory development and implementation, opportunities could be considered to incorporate the local ICT sector into development programming with engagement opportunities such as prize challenges and grant opportunities targeting specific sectoral challenges in Kenya.

In addition, supporting accelerators, incubators, mentorship programs, as well as support services for SMEs (both government- and private sector-sponsored) will help further cultivation of startup leaders with both technical and business acumen. This could include technical assistance through private sector accelerators and government channels such as the Competition Authority to provide accessible, low-cost or free services (such as incorporating a new enterprise) to enable streamlined support for new businesses, technical assistance to support the structuring and formalization of new enterprises, and opportunities for international market networking.

At the same time, given the lack of affordable, accessible, and appropriate local funding for nascent digital entrepreneurs, international development actors have a strong potential role to play in socializing ICT lending opportunities with local financiers (impact investors and family offices, and more commercial banks once the industry has matured significantly). This may require partnership development with entities such as the African Guarantee Fund and other facilities offering blended finance products to help lower the risk of potential investments. This could involve an initial landscape assessment of key market players across the Kenyan finance sector and the identification of an implementing partner in the local finance community to communicate and market startup investment opportunities and play a matchmaking role to facilitate new collaboration.

To cultivate and increase the local market presence of international financiers providing patient, concessional capital, development actors can leverage their donor community and private-sector networks. This can provide startups with more time to scale and give social entrepreneurs time to develop business models for products and services that reach bottom-of-the-pyramid populations. Additionally, engaging multinationals to pilot software service market entry in-country, utilizing local SMEs whenever possible would encourage multinationals to find strong value in local business partnerships, in lieu of direct financing.

BOX 6: Quick Reference Guide For Any Digitally Enabled Program

To ensure digital programming achieves its intended outcomes and impact, it is critical to understand and integrate the Principles for Digital Development into program design. These principles are nine living guidelines that provide best practices for every phase of the project life cycle. They were created in consultation with various international development organizations including USAID. The principles are: 1) design with the user; 2) understand the existing ecosystem; 3) design for scale; 4) build for sustainability; 5) be data driven; 6) use open standards, open data, open source, and open innovation; 7) reuse and improve; 8) address privacy and security; and 9) be collaborative. Those in the international development community involved in program design for digital development should first familiarize themselves with the principles.

With any digitally enabled program, a few key considerations need to be factored into the design of the program. The checklist below highlights some of these factors, many of which are motivated by the Principles for Digital Development.

Is the target population likely to have consistent, affordable access to the devices your intervention relies on? Mobile phones are much more prevalent in Kenya than laptops (and are often feature phones, not smartphones). Programming requiring smartphone/laptop use should clearly justify assumptions about access to those devices, and prioritize capability of SMS delivery of content when possible.

How affordable will accessing the programmatic content be? The cost of data is a universally limiting factor. Many low-income populations will struggle to utilize data-rich content they must pay for. Video and photos are costly formats, and little content is accessed via streaming services.

How will the program ensure users have the necessary digital skills to effectively engage with your program? Digitally enabled programs should include a digital literacy component. Familiarity with M-Pesa doesn't necessarily mean an individual will be able to adopt other digital tools without training. The program should plan for an appropriate learning curve.

How do you know the target users will find your content relevant? Support localization of online content to optimize relevance to target users. Deliberate efforts to understand users through market research/segmentation should form the basis of digital content creation.

How will the program manage gender divides? Programs that will create online content for women or that are intended to develop digital skills for women should be intentionally developed for and marketed to women. Programs should not assume that products designed for typical male users will be sufficient for female users.

What actions will be taken to protect users/consumers from digital harm? A consumer-focused digital code of conduct should ideally be promoted whenever possible across sectors. Collection of PII and sensitive data should be cognizant of new data protections.

If you are considering digital health tools specifically, please see the more detailed Digital Health Investment Review Tool.

Appendix

A. Definitions

Definitions from USAID Digital Strategy 2020-2024 unless otherwise mentioned.

Cybersecurity: The prevention of damage to, protection of, and restoration of computers, electronic communications systems, electronic communications services, wire communication, and electronic communication, including information contained therein, to ensure its availability, integrity, authentication, confidentiality, and non-repudiation.

Cyber Hygiene: The practices and steps that users of computers and other devices take to maintain system health and improve online security. These practices are often part of a routine to ensure the safety of identity and other details that could be stolen or corrupted.[69]

Data Privacy: The right of an individual or group to maintain control over, and the confidentiality of, information about themselves, especially when that intrusion results from undue or illegal gathering and use of data about that individual or group.

Data Protection: The practice of ensuring the protection of data from unauthorized access, use, disclosure, disruption, modification, or destruction, to provide confidentiality, integrity, and availability.

Digital Divide: The distinction between those who have access to the Internet and can make use of digital communications services, and those who find themselves excluded from these services. Often, one can point to multiple and overlapping digital divides, which stem from inequities in access, literacy, cost, or the relevance of services. Factors such as high cost and limited infrastructure often exacerbate digital divides.

Digital Economy: The use of digital and Internet infrastructure by individuals, businesses, and government to interact with each other, engage in economic activity, and access both digital and non-digital goods and services. As the ecosystem supporting it matures, the digital economy might grow to encompass all sectors of the economy—a transformation driven by both the rise of new services and entrants, as well as backward linkages with the traditional, pre-digital economy. A diverse array of technologies and platforms facilitate activity in the digital economy; however, much activity relies in some measure on the Internet, mobile phones, digital data, and digital payments.

Digital Ecosystem: The stakeholders, systems, and enabling environment that together empower people and communities to use digital technology in order to gain access to services, engage with each other, or pursue economic opportunities. A digital ecosystem is conceptually similar to, but broader than, a digital economy. Although certain aspects of the digital ecosystem have country-wide reach, other features differ across geographies or communities. The critical pillars of a digital ecosystem include 1) sound enabling environment and policy commitment; 2) robust and resilient digital infrastructure; 3) capable digital service-providers and workforce (e.g.,

69 Chris Brooke, "What is Cyber Hygiene? A Definition of Cyber Hygiene, Benefits, and Best Practices," last modified December 5, 2018, https://digitalguardian.com/blog/what-cyber-hygiene-definition-cyber-hygiene-benefits-best-practices-and-more

both public and private institutions); and 4) empowered end-users of digitally enabled services.

Digital Identity: The widely accepted Principles on Identification define identity as "a set of attributes that uniquely describes an individual or entity." Digital identification (ID) systems often require registering individuals onto a computerized database and providing certain credentials (e.g., identifying numbers, cards, digital certificates, etc.) as proof of identity. Government actors can set up these systems to create foundational, national ID programs, or donors or non-governmental organizations (NGOs) for functional purposes to identify beneficiaries, e.g., for humanitarian assistance and service-delivery.

Digital Literacy: The ability to access, manage, understand, integrate, communicate, evaluate, and create information safely and appropriately through digital devices and networked technologies for participation in economic and social life. This may include competencies that are variously referred to as computer literacy, information and communication technology (ICT) literacy, information literacy, and media literacy.

Gross National Income: The gross national income (GNI), previously known as gross national product (GNP), is the total domestic and foreign output claimed by residents of a country, consisting of gross domestic product (GDP), plus factor incomes earned by foreign residents, minus income earned in the domestic economy by nonresidents. [70]

Patient Capital: Long-term debt or equity investment that forgoes immediate returns for longer-term returns, often below market rate. Generally undertaken by investors with high risk profiles seeking both profit and social/environmental impact.[71]

TV White Space: The unused spectrum between TV stations that can be capitalized upon for increased connectivity. This block of spectrum is ripe for innovation and experimental use, holding rich potential for expanding broadband capacity and improving access for many users, and for developing technologies that can expand this type of spectrum access to other frequencies and services in order to greatly increase our ability to utilize spectrum.[72]

70 Note: GNI is utilized here over GDP as it is increasingly preferred by the World Bank, the European Union, and other major global players. Jim Chappelow, "Gross National Income (GNI)," Investopedia, accessed May 4, 2020, https://www.investopedia.com/terms/g/gross-national-income-gni.asp

71 Paul Brest and Kelly Born, "Unpacking the Impact in Impact Investing," Stanford Social Innovation Review, 2013, https://ssir.org/articles/entry/unpacking_the_impact_in_impact_investing

72 Federal Communications Commission, "White Space," accessed May 4, 2020. https://www.fcc.gov/general/white-space

B. Methodology

The Kenya DECA included the following four components:

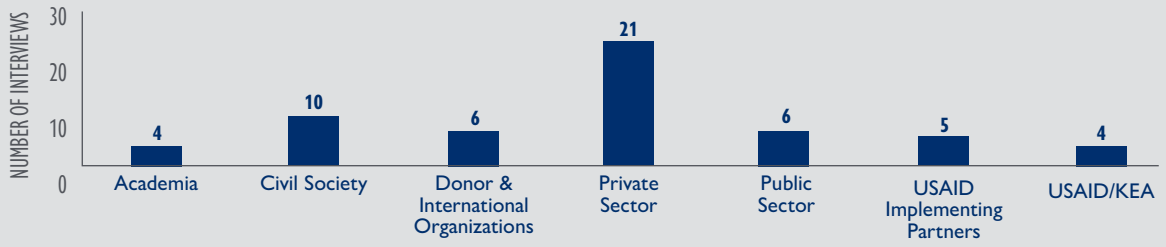
1. **USAID/KEA engagement:** USAID/KEA designated one point of contact within the USAID/KEA program office. This engagement was not only important for ensuring an appropriate mix of interviewees, but was also critical to building the research team's understanding of USAID/KEA priorities.

2. **Desk Research:** The desk research used a standardized template organized around three pillars (digital infrastructure, access, and use; digital society and governance; and digital economy). One component was quantitative analysis of open-source data to produce regional comparisons (e.g. GSMA, World Economic Forum, International Telecommunication Union, and Varieties of Democracy). A second component was investigating high-level questions for each pillar on the current state of Kenya's digital ecosystem.

   The information from the desk research, along with conversations with USAID/KEA colleagues were used to build out cross-cutting development priorities pertaining to Kenya's digital ecosystem. The themes were digital divides, devolution, economic growth, private-sector engagement, the youth bulge, and corruption mitigation. These themes acted as secondary country-specific lenses to the already existing three pillars of the DECA. The desk research and key themes were used (in addition to relevant news stories and reports) to inform the interview guide questionnaires.

3. **Key Informant Interviews:** The research team collaborated with USAID/KEA to compile a list of target stakeholders across civil society, academia, international organizations, the private and public sectors, and within USAID/KEA. To ensure a diverse mix of interviewees, the research team evaluated the list of scheduled interviews prior to in-country research and conducted additional outreach in an attempt to fill identified gaps. The graph below and Appendix C shows the 56 interviews by sector (informed by 40 female interviewees, and 52 male interviewees). The private sector interviewees, comprising the majority of interviews, included mobile network operators, startups, microfinance institutions, and large tech companies, among others.

FIGURE 5. Summary of Key Informant Interviews, by Sector



Note: Some interviews were group interviews. In other cases, the DECA team held more than one interview with different individuals from the same organization. These are noted in the key informant interviews table in Appendix C.

Each interviewee was asked a general set of high-level questions, which were developed before in-country research and tailored to be more targeted based on the interviewee, their organization, and learnings from previous interviews.

4. **GeoPoll Nationally Representative Survey:** Polling data was integrated into the DECA research process to fill gaps, confirm findings, and illuminate individual-level perspectives on Kenya's digital ecosystem. After the TDY, a 20-question survey was developed in partnership with a contracted data polling research company and was deployed using computer-assisted telephone interviewing (CATI). The survey was nationally representative by age, gender, and location, with a sample size of 1,000 respondents. The survey asked questions about Internet and mobile phone access and use, online privacy and security, lending practices, and adoption of DFS. Complete survey data will be available at the USAID Development Data Library data.usaid.gov.

ANALYSIS

The bulk of the analysis was conducted while in-country. Upon returning from the in-country research, the team convened to revisit these themes, confirmed their validity against some interview notes, and proceeded to organize the findings around strengths, ecosystem challenges, emerging threats, and opportunities.

LIMITATIONS

The research team was limited, to an extent, by their technical expertise. Research team members were chosen to provide coverage of key technical areas identified in a preliminary review, particularly around infrastructure, the private sector, and digital finance. This may introduce some bias, weighting the specializations of team members more heavily than areas such as digital society and governance.

A large portion of interviewees were selected through USAID/KEA and CDD networks, which may have excluded stakeholders who are less comfortable engaging with U.S. government representatives. Rather than rigorous qualitative methods (e.g., thematic coding), analysis of interview notes depended on triangulation of findings within the research team, who attempted to balance thematic gaps by consulting CDD technical experts and seeking out additional interviewees.

The report authors accept responsibility for any errors or inaccuracies in this report.

RESEARCH TEAM

The six-member research team was composed of digital development generalists and specialists with technical expertise in infrastructure, access, and digital financial services. As much as possible, team members who were technical experts attended all interviews relevant to their expertise.

C. Key Informants

ACADEMIA	
1	Dr Bitange Ndemo
2	Dedan Kimathi University of Technology
3	Julie Zollmann Consultants
4	Strathmore University
CIVIL SOCIETY	
5	African Centre for Women, Information, and Communications Technology (ACWICT)
6	American Chamber of Commerce - Kenya
7	Article 19
8	Bloggers Association of Kenya (BAKE)
9	Election Observation Group (ELOG)
10	Financial Sector Deepening (FSD) Kenya
11	Kenya ICT Action Network (KICTANet)
12	Kenya Private Sector Alliance (KEPSA)
13	Living Goods
14	Mzalendo Trust
DONORS AND INTERNATIONAL ORGANIZATIONS	
15	African Telecommunications Union (ATU)
16	British High Commission
17	BRAC Kenya
18	MasterCard Foundation
19	United Nations Development Programme (UNDP)
20	The World Bank - Washington DC
PRIVATE SECTOR	
21-22	Caribou Digital (2 interviews)
23	C-Squared
24-25	GSMA (2 interviews)
26	IBM Kenya
27	Jumia Foods
28	Liquid Telecom
29	Node Africa
30	Mawingu Networks
31	Safaricom
32	Telkom Kenya
33	Wonderkid
PRIVATE SECTOR: STARTUPS/ACCELERATORS	
34	BRCK
35	CarePay
36	eKitabu
37	iLab Africa - Strathmore University
38	Qhala
39	Shujaaz/Well-Told Story
40	Tulaa
41	Ushahidi

PUBLIC SECTOR	
42	ICT Authority Kenya
43	Kiambu County Ministry of ICT
44	Kiambu County TVET
45	Kenya Institute of Curriculum Development
46	Ministry of ICT (GoK)
47	Ministry of Interior and Coordination of National Government - Department of Immigration Services (GoK)
USAID IMPLEMENTING PARTNERS	
48	Deloitte (YALI)
49	Johns Hopkins University Center for Communication Programs (JHU CCP)
50	MercyCorps
51	RTI KYES
52	RTI Tusome
USAID/KEA	
53a	Democracy, Human Rights, and Governance (Group Interview)
53b	Education (Group Interview)
53c	Feed the Future (Group Interview)
53d	GIS (Group Interview)
54	Gender
55	Environment
56a	Front Office
56b	Program Office

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