

Insight

Published: October 2024

Report authors

Ian Streule, Gilles Monniaux,
Julia Allford and Jon Driver,
Analysys Mason

BII leads

Paddy Carter and Amelie Fabian



Impact of investment in the Ethiopian telecoms market – the story so far

Practical thinking on investing for development

Insight is a series of practical and digestible lessons on the issues of private sector investment and development. They're based on our experiences, knowledge and research and are aimed at investors, businesses, development professionals, and anyone with an interest in private sector development.

To view the rest of our Insight series visit:

► bii.co.uk/insight

About this report

This report contains the results of research and analysis of the Ethiopian telecoms sector and associated digital economy. It has been prepared by Analysys Mason on behalf of British International Investment (BII) and Safaricom Ethiopia. BII is the UK's development finance institution and a trusted investment partner to businesses in the Caribbean, Asia and Africa, including in Ethiopia. Safaricom Ethiopia was awarded a telecoms services license in Ethiopia in 2021, following the liberalisation of the sector. It is owned by Global Partnership for Ethiopia, a consortium comprising Safaricom PLC, Vodafone Group, Vodacom, Sumitomo Corporation, International Finance Corporation, and BII.

Authors

Ian Streule is a Partner at Analysys Mason with over 25 years of consultancy experience advising on policy, regulation and strategy, for industry, regulator and government clients across the globe, including many in Africa such as Kenya, Nigeria, South Africa, Uganda, and Zambia.

Gilles Monniaux is a Principal at Analysys Mason with over 20 years' experience in the industry and significant expertise in regulatory matters, having supported operators, regulators and government authorities in the Bahamas, Belgium, Brazil, France, Mexico, New Zealand, Norway, Saudi Arabia, Slovenia and the UK.

Julia Allford is a Consultant at Analysys Mason with experience supporting operators, regulators and governments on regulatory, research and cost-modelling projects.

Jon Driver is an Associate Consultant at Analysys Mason experienced in conducting data research and analysis.

Analysys Mason Limited
St Giles Court
24 Castle Street
Cambridge CB3 0AJ
UK

Tel: +44 (0)1223 460600
www.analysysmason.com

Registered in England and Wales No. 5177472

Acknowledgements

This report is the result of a baseline study led by a team of consultants at Analysys Mason (Ian Streule, Gilles Monniaux, Julia Allford and Jon Driver), with Paddy Carter and Amelie Fabian from BII overseeing the study. We thank Wim Vanhelleputte from Safaricom Ethiopia for commissioning the study, and Tim Kelly from the World Bank, Georges Vivien Hounbouon and Davide Strusani from the International Finance Corporation and Philippe Vogeeler from Vodafone for their collaboration with the study, along with Abhinav Sinha and Andrej Machacek at BII for their helpful inputs.

Contents

About this report	2
Foreword	3
Executive summary	4
1. Introduction	7
1.1 Introduction to Ethiopia	7
1.2 The Ethiopian telecommunications market	8
1.3 Rest of this report	10
2. Impact of competition on connectivity	11
2.1 Price reduction	11
2.2 Infrastructure deployment	14
2.3 Demand for connectivity	19
2.4 Digital technology adoption	21
3. Impact of digital connectivity	25
3.1 Socioeconomic benefits	25
3.2 Mobile financial services	29
3.3 Digital services	31
4. Conclusions and future work	34
Annex	36

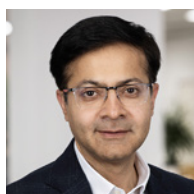
Foreword

It is not often that we get the chance to support an investment with such a profound impact on so many people's lives, as Safaricom Ethiopia. The liberalisation of the Ethiopian telecoms market, the resulting investment in digital infrastructure and services and the competition for customers has already reduced prices and improved services for millions of people. As this report shows, there is still much to be done, such as the continuing build out of 4G infrastructure in more remote areas – and much to look forward to, such as the possibilities opened up by digital money and digital ID.

Digital connectivity has an impact in its own right, keeping family and friends in touch with each other and bringing access to information, entertainment, and useful services. But it also opens up opportunities for inclusive digitally enabled businesses with the potential to transform the Ethiopian economy. We now have a great deal of high-quality empirical evidence that demonstrates the impact of digitalisation on higher firm productivity and job creation, and it is no exaggeration to say that investments in digital infrastructure and services can be the foundation of economic growth and poverty reduction.

The last major African economy to liberalise its telecoms market was obviously a commercial opportunity, but Ethiopia can also be a challenging environment to do business in, and three years ago there were many unknowns about how the telecoms market would develop. The support of BII, both our risk-bearing capital and our ability to add value through our expertise and relationships, was instrumental in the decision of Safaricom, Vodacom and Vodafone Group, and Sumitomo Corporation, to create a company to bid for a licence. In the event, there was only one other unsuccessful bidder for the licence, illustrating the reluctance of telecoms companies to enter without the support of development finance institutions (DFIs). The support of DFIs, now including our partners at the IFC, will continue to be crucial for financing Safaricom's future investments in the Ethiopian economy.

This report gives a snapshot of the Ethiopian telecoms market today. We hope and expect to look again in years to come, and see more evidence of the many positive impacts on society of this investment.



Abhinav Sinha

Managing Director and Head of Technology and Telecoms
British International Investment

Executive summary

Ethiopia, a landlocked nation in the Horn of Africa, is the fourth largest country in sub-Saharan Africa and the second most densely populated, home to a growing population of over 105 million people.¹ Most of the population (77 per cent) live in rural areas,² in large, low-educated households, working in agriculture or casual labour.

At the start of 2019, Ethiopia was the last major economy worldwide without a liberalised telecoms market; state-run Ethio Telecom was the country's only telecoms network operator. Following the government's commitment as part of the home-grown economic reform agenda, in the second half of 2018,³ a proclamation published on 12 August 2019 marked the start of Ethiopia's telecoms market liberalisation, by establishing the Ethiopian Communications Authority (ECA) as an "independent, transparent and accountable Regulatory Authority" tasked with "restructuring the telecommunications market and introducing competition to enhance the economic and social development of the country".⁴

The government's desire for a competitive, liberalised telecoms market was realised in 2021 when Safaricom Telecommunications Ethiopia PLC (Safaricom Ethiopia)⁵ was granted a nationwide, full-service unified telecoms service license. In October 2022, Safaricom Ethiopia launched mobile voice, Short Message Service (SMS) and data services for personal and business users in competition with Ethio Telecom. Within its first year, Safaricom Ethiopia had 4.1 million active mobile subscribers, corresponding to a 5 per cent market share of the total telecoms subscriber base. Ethio Telecom's mobile data package prices have decreased by approximately 70 per cent since 2017. Safaricom Ethiopia's prices have declined by 50–70 per cent across its portfolio in the year since launch. Both operators have grown their customer bases, and the Ethiopian telecoms market continues to evolve, which may extend to include additional operators in the future.

This report identifies the impact that competition from Safaricom Ethiopia has had, and is expected to have, on the Ethiopian telecoms sector, society and economy. Throughout this report, we benchmark Ethiopia against six other African countries chosen for their comparable demographics.⁶

Key findings from our analysis include:

Impact of competition on investment in connectivity

- **Since liberalisation, mobile and fixed broadband prices have decreased significantly, bringing Ethiopia in line with benchmarks and closer to the United Nation's (UN's) 2025 affordability target.**⁷ This is particularly true for entry-level mobile broadband services which are much cheaper than their fixed broadband counterparts. Competition has also reduced already low voice and SMS prices.

50-70%

decrease in Safaricom Ethiopia's prices within a year of launching

70%

decrease in Ethio Telecom mobile data package prices since 2017

1 Ethiopian Statistical Service, Survey Reports, available at <http://www.statsethiopia.gov.et/our-survey-reports/>

2 World Bank, Open Data, available at <https://data.worldbank.org>

3 The World Bank, Project Information Document, available at <https://documents1.worldbank.org/curated/en/650161570436992486/pdf/Concept-Project-Information-Documents-PID-Ethiopia-Digital-Foundations-Project-P171034.pdf>

4 Communications Services Proclamation No. 1148/2019, available at https://www.mofed.gov.et/media/filer_public/7c/78/7c781a5b-1c06-4f6d-9128-6fa116cf71e8/communicationsserviceproclamationno1148-2019.pdf

5 Safaricom Ethiopia is owned by Global Partnership for Ethiopia, a consortium of companies with the following shareholding structure as of 2023: Safaricom Plc (51.67%), Sumitomo (25.23%), BII (10.11%), IFC (7.25%) and Vodacom (5.74%). See <https://www.safaricom.co.ke/images/Downloads/Safaricom-Ethiopia-Quarterly-Update-Q1-FY24.pdf>

6 Egypt, Kenya, Nigeria, Sudan, Tanzania and Uganda.

7 The International Telecommunication Union (ITU), Datahub, available at <https://datahub.itu.int/>

- **The introduction of competition to the connectivity market has driven further investment in network infrastructure to improve coverage and quality of service.** Ethiopia's network performance (an aggregation of upload speed, download speed and latency) was the weakest of the benchmarks in 2020, and has since steadily increased to a central position.⁸ Of significance for access to high quality data services, Safaricom Ethiopia has deployed nearly 3,000 towers, and fourth generation (4G) mobile coverage has doubled since it entered the market.⁹ Several new data centres have also launched since liberalisation; these will support both improved telecoms connectivity and more advanced digital services. For a greater share of the population to benefit from enhanced connectivity, Safaricom Ethiopia is planning additional infrastructure investments to expand its site portfolio.
- **There is a growing demand for high-quality connectivity in Ethiopia.** More people have taken up fixed and mobile services in recent years, with a particular emphasis on higher-quality data services such as those provided by 4G. The demand from individual users has also increased, with greater traffic generated per user. As traffic on networks increases, further network deployment and therefore investment will be crucial to ensure quality of service meets approved standards and continues to improve.
- **Adoption of digital technologies is growing, enabling more consumer and enterprise customers to use digital services.** Computer ownership is relatively low (2.9 per cent in 2019)¹⁰ and could improve, while mobile phone ownership is much higher (33 per cent of individuals have a mobile phone subscription and 81 per cent of households have access to a mobile phone)¹¹ and is still growing. The share of smartphone ownership is also high (43 per cent of unique mobile connections as of Q3 2023) despite high smartphone costs – representing 97 per cent of monthly gross national income (GNI) per capita in Ethiopia compared to 34.36 per cent in Kenya and 33.29 per cent in Nigeria.¹² Ethiopia has a relatively low proportion of internet users (17 per cent in 2021)¹³ with most using it for information and entertainment. The upgrade of voice/feature phones to 4G+ smartphones capable of supporting a wide range of digital services is a key shift needed to support the delivery of Ethiopia's digital ecosystem.

Impact of connectivity on society and the economy

- **Improvements in mobile network coverage and internet usage in other African markets have been shown to have positive impacts on labour markets, personal finance and health outcomes.** We anticipate similar benefits for Ethiopia. Ethiopia's economy has grown in recent years and digital connectivity can help to achieve the Ethiopian government's 2025 Homegrown Economic Reform Agenda targets as well as other development agenda goals. Digitalisation creates tremendous new opportunities for inclusive businesses, and the potential impact on the Ethiopian economy enormous.¹⁴

4G coverage

has doubled since Safaricom Ethiopia entered the market

81%

of households have access to a mobile phone

8 Global System for Mobile Communications Association Intelligence (GSMA Intelligence), Data, available at <https://www.gsmainelligence.com/data/>

9 ITU, Datahub, available at <https://datahub.itu.int/>

10 Cogent Education, Unpacking the equity of accessing the digital library and educational television channels for primary and secondary school students in Ethiopia, available at <https://www.tandfonline.com/doi/epdf/10.1080/2331186X.2023.2253052?needAccess=true>

11 Euromonitor Passport, available at <https://www.euromonitor.com/our-expertise/passport>

12 GSMA, Mobile Money in Ethiopia, available at https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2023/06/GSMA_Mobile-money-in-Ethiopia-Advancing-financial-inclusion-and-driving-growth-report.pdf

13 ITU, Datahub, available at <https://datahub.itu.int/>

14 Cruz, Marcio; editor. 2024. Digital Opportunities in African Businesses. Washington, DC: World Bank. <http://hdl.handle.net/10986/41447>

- **Mobile connectivity is fundamental to improving financial inclusion and can help improve fiscal stability by enabling mobile financial services (MFS).** Ethiopia's mobile money market is nascent and has a clear opportunity to grow, both in terms of the number of users and the value of transactions. Safaricom's M-PESA (launched in Ethiopia in August 2023 and with approximately 5.8 million registered users to date) has been instrumental in improving financial inclusion in Kenya and could do the same for Ethiopia in tandem with Ethio Telecom's Telebirr. MFS also support the formalisation of markets and simplify taxation.
- **Beyond MFS, other targeted digital services such as digital ID, digital health, digital education and digital agriculture will be needed to unlock specific socioeconomic benefits.** Connectivity providers, in particular Safaricom Ethiopia, are already starting to play a crucial role in supporting the success of these services beyond just supplying the necessary connectivity.

The liberalisation process, started in 2019, has delivered a range of successes to date. More investment leading to telecoms and digital improvements will be seen in the coming years, and this will significantly support the development of financial inclusion, gender equality, agriculture, education and health.

Over the next few years, the Ethiopian telecoms market will continue to evolve and benefit society and the economy. Some potential impacts to look out for include price evolution, an increase in internet access, the development of MFS and the evolution of socioeconomic factors.



1

Introduction

1.1 Introduction to Ethiopia

Ethiopia is a landlocked nation in the Horn of Africa with a varied geography, including the largest continuous mountain range on the continent and a significant number of major rivers, including the Blue Nile. It is the fourth largest country in sub-Saharan Africa and the second most densely populated, home to a growing population of over 105 million people.¹⁵ Most of the population (77 per cent) live in rural areas,¹⁶ in larger households than the country's average (rural households averaged 4.6 people compared with 3.7 people per urban household in 2021).¹⁷ See Annex A.1 for a breakdown of Ethiopia's population by gender, age and rurality.

Ethiopia has seen rapid economic growth, with a gross domestic product (GDP) growth rate above 5 per cent for every year since 2004. Its growth rate has consistently been among the fastest on the African continent. Since 2004, the percentage of Ethiopians living in extreme poverty (with a purchasing power parity (PPP) of less than 2.15 international dollars in 2017 terms per capita per day) has fallen from 35 per cent, to 27 per cent in 2015.¹⁸ Poverty is higher in rural areas – 26 per cent versus 15 per cent in urban areas.¹⁹ A few decades ago, Ethiopia was one of the poorest countries in the world so, despite its recent impressive performance, the country is still classified as low income, with the average annual national income currently around \$1,020 per person.²⁰ Ethiopia aims to reach lower-middle income status by 2025.

¹⁵ Ethiopian Statistical Service, Survey Reports, available at www.statsethiopia.gov.et

¹⁶ World Bank, Open Data, available at <https://data.worldbank.org>

¹⁷ International Labour Organisation, ILOSTAT, available at <https://ilostat.ilo.org/>

¹⁸ World Bank, Open Data, available at <https://data.worldbank.org/>

¹⁹ The definition of poverty here is the national poverty line, which differs from \$2.15 in international dollars, mentioned above. World Bank Group, Ethiopia Poverty Assessment, available at <https://documents1.worldbank.org/curated/en/992661585805283077/pdf/Ethiopia-Poverty-Assessment-Harnessing-Continued-Growth-for-Accelerated-Poverty-Reduction.pdf>

²⁰ World Bank, Open Data, available at <https://data.worldbank.org/>

Strong economic growth reflects the Ethiopian government's efforts to modernise the economy through a combination of public investment in infrastructure and education, agricultural development and industrialisation. The country's Homegrown Economic Reform Agenda now aims to sustain economic growth through creating an environment supportive of higher private investment and structural transformation.²¹

The share of employment in agriculture has fallen steadily, from 78 per cent in 2004 to 63 per cent in 2022, as employment in services has grown (15 per cent in 2004 to 31 per cent in 2022). The process of structural transformation in Ethiopia is still at a relatively early stage – in 2022, employment in industry stood at 7 per cent. As of 2021, employment rates were higher for males (69 per cent compared with 50 per cent for females) and lower in urban areas (51 per cent compared with 62 per cent for rural).²² See Annex A.1 for a breakdown of employment in 2021 by sector, gender and rurality.

Ethiopia has a youthful population – 53 per cent of the population was aged under 25 in 2021. The country has made considerable progress related to human development since 2000, with primary school enrolment reaching 89 per cent in 2021, child mortality more than halving (46.2 deaths under-five per 1000 live births in 2022 from 141.2 in 2000) and access to clean water doubling (from 19 per cent of the population using at least basic drinking water services in 2000 to 52 per cent in 2022).²³ But these rapid improvements were from a low base, and the country remains in the low category of the UN's Human Development Index.²⁴ The average literacy rate is 49 per cent, with lower rates for females than males (43 per cent compared with 56 per cent), and lower rates in rural areas (43 per cent compared with 73 per cent in urban areas).²⁵ See Annex A.1 for more detail on school enrolment and literacy rates in Ethiopia.

1.2 The Ethiopian telecommunications market

At the start of 2019, Ethiopia was the last major economy worldwide to introduce telecoms competition;²⁶ state-run Ethio Telecom was the country's only telecoms network operator.

Following a series of government commitments in the second half of 2018,²⁷ Communications Services Proclamation No. 1148/2019 (the Proclamation) was published on 12 August 2019, marking the start of Ethiopia's telecoms market liberalisation. The Proclamation established the Ethiopian Communications Authority (ECA) as an "independent, transparent and accountable Regulatory Authority" tasked with "restructuring the telecommunications market and introducing competition in order to enhance the economic and social development of the country".²⁸

2019

last major economy to introduce telecoms competition

21 Federal Democratic Republic of Ethiopia, A Homegrown Economic Reform Agenda: A Pathway to Prosperity, available at https://www.mofed.gov.et/media/filer_public/38/78/3878265a-1565-4be4-8ac9-dee9eaf4f1a/a_homegrown_economic_reform_agenda-_a_pathway_to_prosperity_-_public_version_-_march_2020-.pdf

22 International Labour Organisation, ILOSTAT, available at <https://ilostat ilo.org/>

23 UNICEF, Data, available at <https://data.unicef.org/>

24 Ethiopia was at 0.492 in 2022 (low is defined as <0.550) see <https://hdr.undp.org/data-center/human-development-index#/indicies/HDI> for more detail

25 International Labour Organisation, ILOSTAT, available at <https://ilostat ilo.org/>

26 Eritrea and Djibouti are the only two countries which retain a state-owned telecoms monopoly (see <https://ewsdata.rightsindevelopment.org/files/documents/61/WB-P174461.pdf>)

27 The World Bank, Project Information Document, available at <https://documents1.worldbank.org/curated/en/650161570436992486/pdf/Concept-Project-Information-Documents-PID-Ethiopia-Digital-Foundations-Project-P171034.pdf>

28 Federal Democratic Republic of Ethiopia, Proclamation No.1148/2019, available at https://www.mofed.gov.et/media/filer_public/7c/78/7c781a5b-1c06-4f6d-9128-6fa116cf71e8/communicationsserviceproclamationno1148-2019.pdf

The government's desire for a competitive, liberalised telecoms market was realised in 2021, when Safaricom Ethiopia²⁹ was granted a nationwide, full-service unified telecoms service license (see Figure 1).

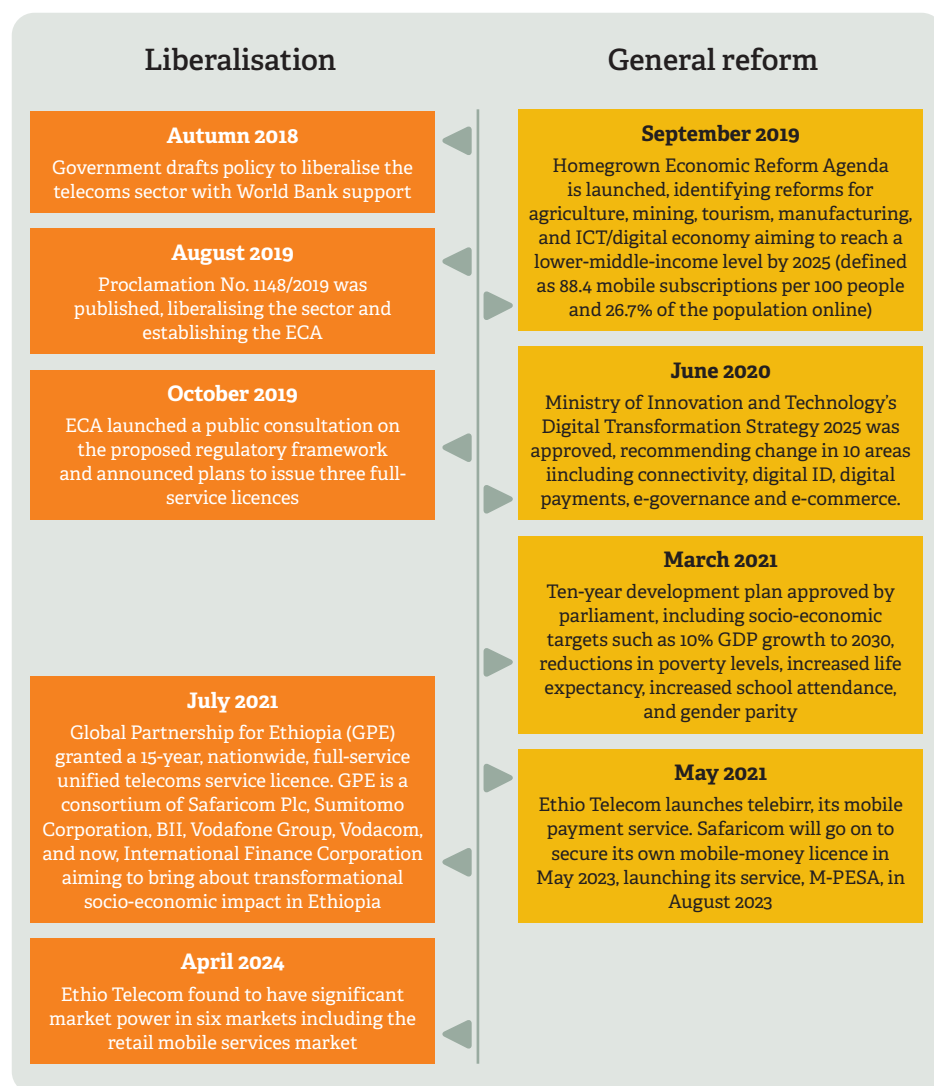


Figure 1: Timeline of key events in the liberalisation journey³⁰

In October 2022, Safaricom Ethiopia launched mobile voice, SMS and data services for personal and business users in competition with Ethio Telecom. Within its first year, Safaricom Ethiopia had 4.1 million active mobile subscribers, corresponding to a 5 per cent market share of the total telecoms subscriber base. Both operators continue to grow their customer bases, and the Ethiopian telecoms market continues to evolve, which may extend to include additional operators in the future.

Despite Safaricom Ethiopia's rapid growth, Ethio Telecom continues to be the dominant operator in the market as recognised by the ECA's determination that Ethio Telecom has significant market power in six markets, including the retail mobile services market, and must therefore comply with pro-competitive remedies identified by the ECA.³¹

2021

Safaricom Ethiopia's entrance marked a key step in the liberalisation journey

4.1 million

mobile subscribers in Safaricom Ethiopia's first year

²⁹ Safaricom Ethiopia is owned by Global Partnership for Ethiopia, a consortium of companies with the following shareholding structure as of 2023: Safaricom Plc (51.67%), Sumitomo (25.23%), BII (10.11%), IFC (7.25%) and Vodacom (5.74%). See <https://www.safaricom.co.ke/images/Downloads/Safaricom-Ethiopia-Quarterly-Update-Q1-FY24.pdf>

³⁰ Safaricom Ethiopia, Ethio Telecom, Ministry of Innovation and Technology, Ministry of Finance, ECA.

³¹ ECA, Determination of Significant Market Power, available at <https://eca.et/wp-content/uploads/2024/05/Determination-on-Mobile-and-Fixed-Telecommunications-Operators-with-SMP.pdf>

1.3 Rest of this report

This report examines the impact of competition introduced via liberalisation on connectivity in Ethiopia, and discusses the expected benefits of better connectivity on society and the economy. Throughout this report, we benchmark Ethiopia against six other African countries (Egypt, Kenya, Nigeria, Sudan, Tanzania and Uganda) chosen for having comparable demographics, as outlined in Annex A.1.

The remainder of this document is laid out as follows:

- Section 2 describes the impact of competition on connectivity
- Section 3 outlines the impact of connectivity on society and the economy
- Section 4 contains the report's conclusions.

The report includes an annex containing supplementary material.



2

Impact of competition on connectivity

2.1 Price reduction

Since liberalisation, mobile and fixed broadband prices have decreased significantly, bringing Ethiopia in line with benchmarks and closer to the UN's 2025 affordability target. This is particularly true for entry-level mobile broadband services which are much cheaper than their fixed broadband counterparts. As such, mobile networks will play a major role in providing internet connectivity to Ethiopia's poorer communities.

Competition has reduced already low voice and SMS prices. However, high mobile termination rates can affect smaller operators' ability to compete effectively.

UN's 2025 affordability target

The UN Broadband Commission for Sustainable Development set a 2025 target for affordable broadband prices in low and middle income countries, defined as the availability of entry-level broadband access (set as 2 gigabyte (GB) for mobile broadband or 5GB for fixed broadband) at a price point that is lower than 2 per cent of the monthly gross national income (GNI) per capita (a proxy for average income).³²

The ITU tracks the prices of two entry-level monthly broadband baskets; including a 5GB fixed service of at least 256kbit/s and a 2GB data-only mobile service of at least 256kbit/s.

2% GNI

is the UN's target for affordable broadband prices by 2025

³² ITU, Affordability of ICT services, available at <https://www.itu.int/itu-d/reports/statistics/2022/11/24/ff22-affordability-of-ict-services/>

Mobile broadband

In Ethiopia in 2022, the mobile data-only basket was close to the UN's target at only 3.4 per cent of monthly GNI per capita.³³ The 2GB mobile data price point was significantly higher before the market was liberalised. Figure 2 shows how Ethiopia has moved from having the most expensive price for the mobile data-only basket in 2019 to a price point in the middle of benchmarked markets by 2022.

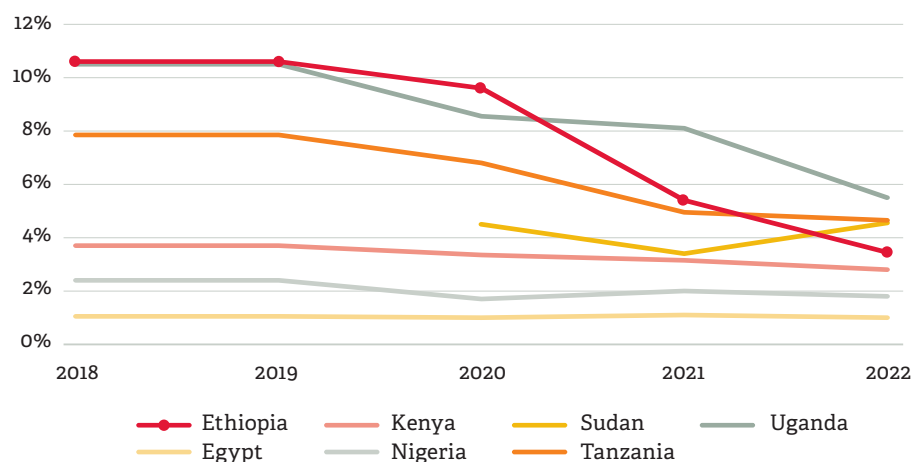


Figure 2: Cheapest price for 2GB mobile data over four-week period, share of monthly GNI per capita [Source: ITU Datahub]

Both operators offer a wide range of mobile data packages, from cheaper, smaller packages to more expensive, unlimited data packages. Analysis of Ethio Telecom's prices finds that all mobile data package prices have decreased by approximately 70 per cent from 2017 to H1 2023, not just the 2GB product. Safaricom Ethiopia's prices have also declined by 50–70 per cent across its portfolio in the year since launch. This analysis implies that the price decreases shown in Figure 2 have been extended, and if these trends continue, mobile broadband in Ethiopia may meet the UN's definition of affordability by the target year of 2025.

Fixed broadband

Fixed broadband prices have also steadily declined following liberalisation; analysis of Ethio Telecom's fixed portfolio found that prices have decreased for all packages, improving affordability at all income levels. These price reductions have occurred without the presence of direct competition in the form of alternative fixed broadband providers and may, therefore, be due to competition from mobile broadband services especially mobile data dongles like '4G WI-FI PACKAGES' from Safaricom Ethiopia.

In Ethiopia in 2022, the fixed broadband basket cost 16.3 per cent of monthly GNI per capita.³⁴

3.4% GNI

price for 2GB data-only mobile service in Ethiopia in 2022

50-70%

decrease in Safaricom Ethiopia's prices within a year of launching

70%

decrease in Ethio Telecom mobile data package prices since 2017

16.3% GNI

price for 5GB fixed broadband service in Ethiopia in 2022

³³ ITU, Datahub, available at <https://datahub.itu.int/>

³⁴ ITU, Datahub, available at <https://datahub.itu.int/>

At 16.3 per cent of GNI per capita in 2022, the price for 5GB is now more aligned with benchmarks.³⁵ However, this price is still higher than both the equivalent entry-level mobile broadband package (3.4 per cent as shown in Figure 2) and the UN's 2 per cent target affordability threshold. This is in line with the rest of Africa, where it is common for mobile broadband to be more affordable than fixed broadband.

We note that while lower prices are good for customers, there can be a risk of anti-competitive pricing, where prices are temporarily set below cost to eliminate competition, before being raised again. The ECA should monitor the risk of predatory pricing as part of its market review practice.

Voice and SMS

Voice and SMS prices have also reduced since market liberalisation, reaching 1.1 per cent of GNI in 2022, as shown in Figure 3. However, even in 2018 these were already at the lower end of benchmarked markets, at 1.9 per cent of GNI which means that the impact of competition has been less marked than for mobile broadband and fixed broadband.

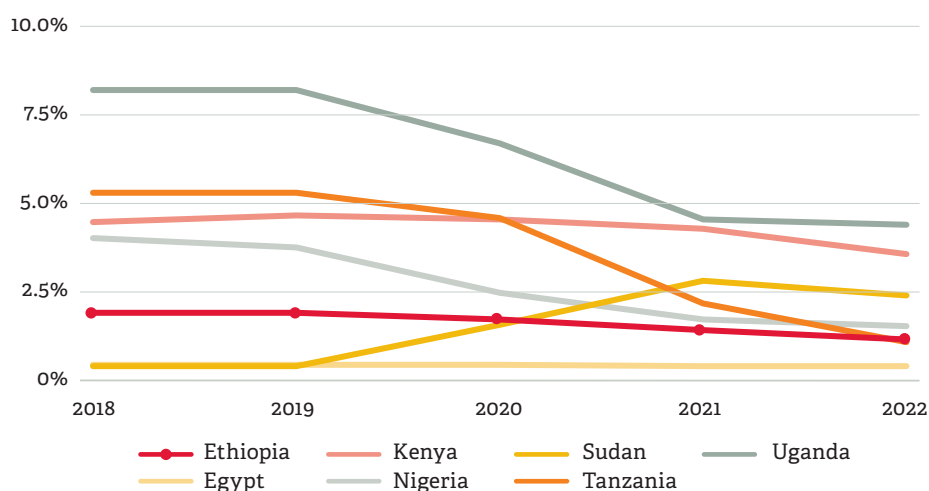


Figure 3: Price for 70 minutes of voice and 20 SMSs, share of GNI per capita [Source: ITU Datahub]

An important factor affecting competition for voice and SMS services is the cost of interconnection with other operators to allow communications between subscribers that are on different networks (for example, a Safaricom Ethiopia subscriber calling or sending an SMS to an Ethio Telecom subscriber). The cost of that interconnection is known as the Mobile Termination Rate (MTR), and is payable by the originating network to the terminating network on a per minute, or per SMS, basis.

When the incumbent's MTR is high, it can account for a large proportion of alternative operators' costs and therefore make it more difficult for them to compete on price with the incumbent.

When the incumbent's MTR is regulated with a price cap, the alternative operator is better able to compete effectively (by matching or even undercutting the incumbent's prices).

The ECA recognises how important the MTRs are for competition and the pricing of voice and SMS services. As a consequence, it has undertaken initiatives to regulate them. It first mediated an interim rate of ETB0.31 per minute for voice MTR in 2022, pending the completion of a cost study. It then announced, in April 2024, a reduction of voice MTR to ETB0.23 per minute from 1 May 2024, followed by yearly reductions leading to a rate of ETB0.19 by 2029.³⁶ This decision by the ECA to regulate MTRs is in line with best regulatory practice. For instance, regulators in Kenya, Tanzania and Uganda have implemented MTR price caps which have been reviewed and adjusted over time to support lower prices for consumers.

1.1% GNI

for price for 70 voice minutes and 20 SMSs in Ethiopia in 2022

³⁵ ITU, Datahub, available at <https://datahub.itu.int/>

³⁶ ECA, Determination on Mobile and Fixed Termination Rates, available at <https://eca.et/wp-content/uploads/2024/05/Determination-on-Mobile-and-Fixed-Termination-Rates.pdf>

2.2 Infrastructure deployment

For consumers and businesses to benefit from connectivity, they need to have access to a suitable network at home and at work. As in many developing markets, mobile networks represent most of the investment in telecoms infrastructure in Ethiopia.

The introduction of competition to the connectivity market has driven significant deployment of network infrastructure to improve coverage and quality of service. Most importantly, 4G coverage has doubled since Safaricom Ethiopia entered the market. Several new data centres have also launched since liberalisation; these will support both basic telecoms connectivity and more advanced digital services.

There is still more investment and deployment required to increase coverage of high-quality services, particularly in rural areas. Mobile services will be the main connectivity service in Ethiopia as these can compete effectively with the existing, mostly low-speed, fixed network. However, mobile network deployment is more expensive in rural areas than urban areas, so additional investment will be needed. Tower sharing is a cost-efficient way to increase coverage.

Mobile infrastructure

The number of mobile towers in Ethiopia has grown significantly since Safaricom Ethiopia's launch (see Figure 4).³⁷ Ethiopia's tower count increased from 8,000 to 10,200 between Q1 and Q3 2023, over 2,000 of which were deployed by Safaricom Ethiopia,³⁸ while Ethio Telecom deployed around 100 towers in the same period.³⁹ To date, Safaricom has deployed nearly 3,000 towers.

3,000

towers deployed by Safaricom Ethiopia since launch

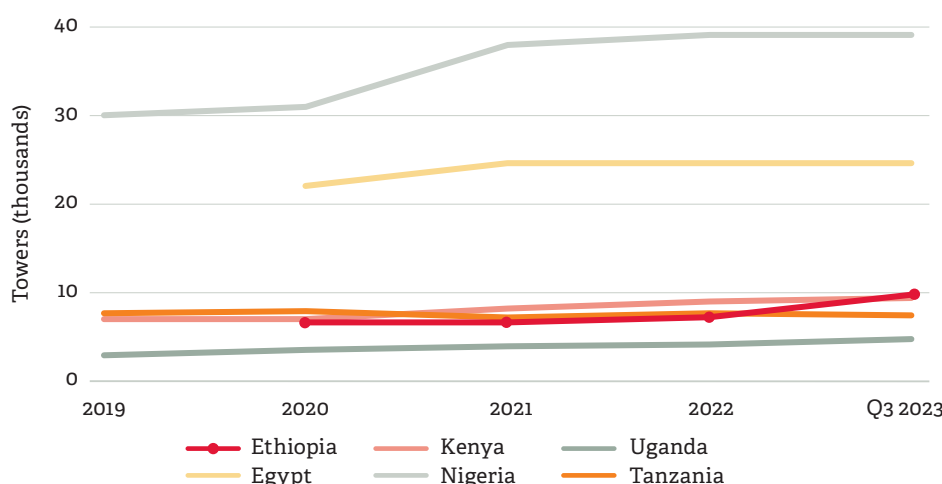


Figure 4: Tower counts for benchmark countries [Source: TowerXchange estimates]

37 This figure shows the trends in building additional towers for Ethiopia and the benchmarked countries in absolute terms irrespective of the size of the country or the population.

38 In addition, Safaricom Ethiopia has more than 1,000 operational sites where it is leasing access to the tower from Ethio Telecom. More are being added following investment by Ethio Telecom to improve its power system to accommodate Safaricom Ethiopia.

39 TowerXchange's 2023 Q2 and Q3 sub-Saharan African guides.

Figure 5 shows that the number of SIMs served per tower has fallen in Ethiopia which indicates that new towers are being built faster than customers are being added.

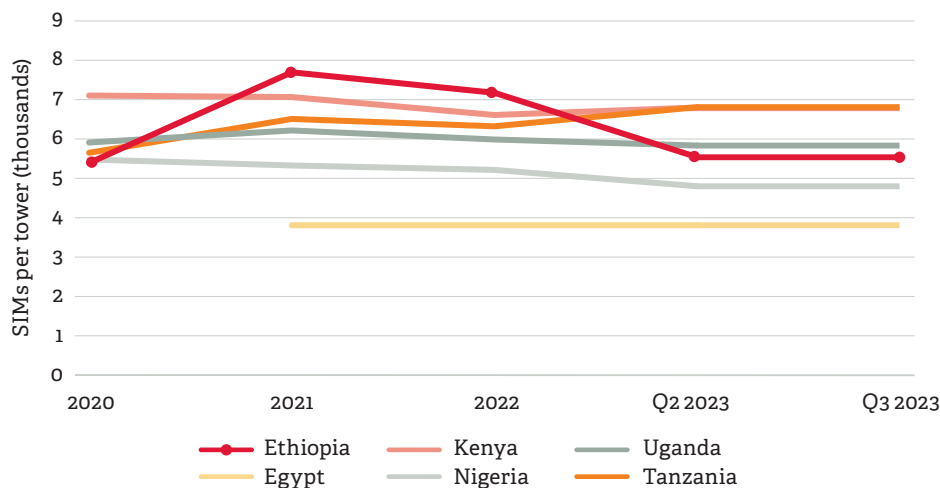


Figure 5: SIMs per tower for benchmark countries [Source: TowerXchange estimates]

Following Safaricom Ethiopia’s launch, mobile network population coverage in Ethiopia has increased, with significant improvements in 3G and 4G coverage (see Figure 6). This growth brought 3G population coverage into the top half of benchmarks in 2022 and 4G population coverage has already doubled from 2021 to 2022. While 4G coverage was still the lowest of benchmarked markets, Safaricom Ethiopia continues their recent 4G rollout to close this gap and increase the availability of high-quality data services.⁴⁰

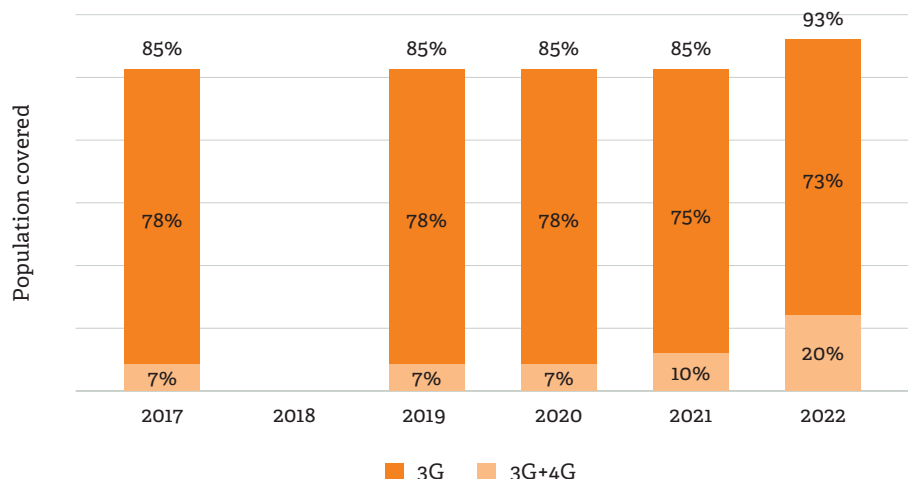


Figure 6: Percentage of the population covered by 3G and 4G mobile network technologies⁴¹ [Source: ITU Datahub]

4G

4G population coverage doubled from 2021 to 2022

93%

3G population coverage by 2022

⁴⁰ITU, Datahub, available at <https://datahub.itu.int/>

⁴¹ There is an existing 2G network that extends further afield, which will simplify the roll-out of further 3G and 4G coverage, but we note that this network does not support internet connectivity.

Safaricom Ethiopia's mobile network currently covers 33 per cent of the population, extending outwards from Addis Ababa to cover 23 major cities and additional smaller cities (see Figure 7).⁴²

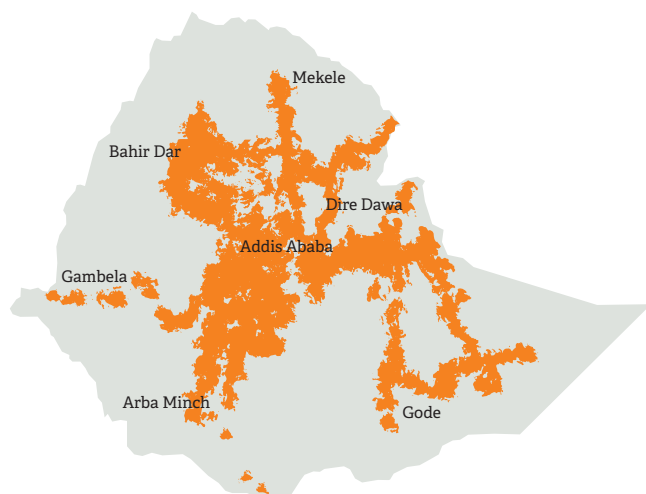


Figure 7: Safaricom Ethiopia's network coverage as of the end of 2023 [Source: Safaricom PLC, 2024]

In addition to covering population centres, Ethio Telecom's mobile network provides near-continuous coverage along major transport corridors to the east, west and south of Addis Ababa.⁴³ This is important as those working in urban centres often live outside the city, so mobile networks must cover the centre, outer villages and transport links to appeal to individual consumers.

Additional investment will be required to extend high-quality data coverage and to cover the more rural areas, such as the smaller settlements in the south-east, as the cost of expanding coverage to rural areas can be quite high compared to the additional customers to be gained.

One way to improve coverage is through tower sharing agreements. This allows operators to share the deployment and operational costs of a site, thereby reducing its costs and increasing the number of sites that an operator can commercially deploy, which unlocks additional benefits (see Box 1).

Box 1: Benefits of mobile tower sharing⁴⁴

An analysis of mobile tower sharing transactions in developing countries between 2008–2019 found that tower sharing deals had a statistically significant impact on coverage, price, uptake and access

- 3G coverage increased by 8.5 percentage points in the two years after the transaction.
- Mobile cellular connection price reduced by 18 per cent two years after the transaction, and the price of mobile internet decreased in larger deals (over 1,300 towers).
- The number of mobile telephony subscribers increased after the transaction and mobile internet subscribers increased in the transaction year.
- There was an increase in internet access in the transaction year for both women-led and rural households.

33%

population coverage by Safaricom Ethiopia in year since launch

8.5pp

average increase in 3G coverage two years after tower-sharing transaction

⁴² Safaricom, Investor Day 2024, available at <https://www.safaricom.co.ke/images/Downloads/Safaricom-Plc-Investor-Day-Presentation-2024.pdf>

⁴³ nPerf, 3G/4G/5G coverage map, Ethiopia, available at <https://www.nperf.com/en/map/ET/-/223603.MTN-Mobile/signal/>. Coverage maps are generated from user data. As such they may not represent a mobile network operator's actual coverage.

⁴⁴ TSE, The Impact of Shared Telecom Infrastructure on Digital Connectivity and Inclusion, available at https://www.tse-fr.eu/sites/default/files/TSE/documents/doc/wp/2023/wp_tse_1427.pdf

Tower sharing is not always straightforward, even if regulatory policy allows it. There are often practical challenges, for instance, towers not initially designed to accommodate multiple operators needing tower strengthening, or upgrades to the power supply and transmission network to support traffic from multiple operators.

An evolution in tower sharing that can drive additional investment to overcome these challenges is through tower companies (TowerCos). TowerCos own, build and maintain mobile towers, leasing space to mobile network operators. The benefit of this model is that operator costs move from high upfront capital expenditure to lower ongoing operating costs. This allows investment budgets to go further in the short term, and enables TowerCos to rent to multiple tenants (operators) – which is a form of tower sharing, with the benefits as described above.

The TowerCo business model is well established in Africa. As of Q3 2023, nearly 50 per cent of telecoms towers in Africa are owned by TowerCos – the largest of which is IHS Towers, followed by American Tower.⁴⁵

We note that there is currently no provision under the Ethiopian regulatory framework for independent⁴⁶ TowerCos to operate. The inclusion of such a provision could be a crucial step to help Ethiopian operators expand their 3G and 4G coverage to more rural areas.

In addition to cost, the state of existing supporting infrastructure can be a key factor in deciding whether and where to deploy new sites. Of particular relevance is the availability of an affordable, reliable power source. The vast majority of electricity in Ethiopia's grid is generated from hydropower, and as such benefits from one of the cheapest prices per megawatt (MW) in the world (ranking third globally in 2023).⁴⁷ In addition, mobile operators have deployed off-grid solutions for their cell sites. This is the case for circa 10 per cent of Safaricom Ethiopia sites, while Ethio Telecom have developed hybrid power solutions, with diesel and solar power back-ups on 50 per cent of sites as of January 2021.⁴⁸

Fixed infrastructure

It is fairly common for developing countries to have limited fixed broadband deployment. This is because deploying even the cheapest type of fixed broadband (DSL) requires houses and business premises to have a fixed access copper network connection, which tends to be limited to only the most densely populated, or wealthiest, settlements in countries like Ethiopia.

Ethiopia's only fixed voice and broadband network, operated by Ethio Telecom, is primarily composed of DSL, although there has been some deployment of fibre-to-the-home (FTTH), which is faster and more reliable, albeit more expensive. As DSL is fairly low-speed, mobile broadband can effectively compete with it, especially when using 4G.

In contrast with the limited FTTH deployment, there is already extensive long-distance fibre backbone infrastructure in Ethiopia connecting areas of high population density, as shown in Figure 8. This fibre backbone infrastructure is owned by Ethio Telecom, Ethiopian Electric Power (EEP),⁴⁹ and the railway⁵⁰ and leased to the operators.

Nearly 50%

of telecoms towers in Africa are owned by TowerCos

⁴⁵ TowerXchange's 2023 Q3 sub-Saharan African guide.

⁴⁶ Not run by Ethio Telecom or Safaricom Ethiopia.

⁴⁷ Business Insider, Top 10 African countries with the cheapest electricity prices in 2023, available at <https://africa.businessinsider.com/local/lifestyle/top-10-african-countries-with-the-cheapest-electricity-prices-in-2023/tq2744d>

⁴⁸ Ethio Telecom, Invitation for infrastructure sharing, available at <https://dev.ethiotelecom.et/invitation-for-infrastructure-sharing/>

⁴⁹ Mobile Europe, Safaricom signs deal to share dark fibre network with Ethiopian electric power company, available at <https://www.mobileeurope.co.uk/safaricom-signs-deal-to-share-dark-fibre-network-with-ethiopian-electric-power/>

⁵⁰ Ethio Telecom, Railway fiber for telecom, available at <https://www.ethiotelecom.et/railway-fiber-for-telecom/>

This long-distance fibre backbone is an important part of Ethiopian telecoms infrastructure, enabling higher quality mobile and fixed services in populated areas where much access infrastructure is located. An expansive fibre backbone is necessary not only for further FTTH deployment, but also for mobile networks as it enables faster communication between mobile sites, supporting use cases requiring lower latency such as video calls, online gaming and financial transactions. While 82 per cent of Ethiopia's population lives within 50km of a fibre network node, only 15 per cent lives within 10km of a fibre network node (and thus would be covered by a rural mobile cell site if deployed at the fibre node).

15%

of the population live within 10km of a fibre network node

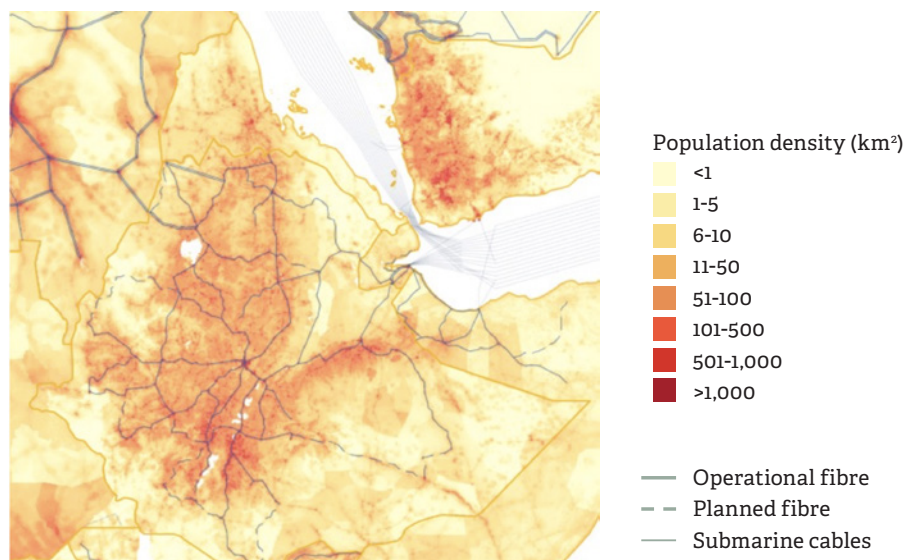


Figure 8: Fibre and submarine infrastructure map overlaying population density for Ethiopia
[Source: ITU]

Supporting digital infrastructure

The deployment of data centres and internet exchange points (IXPs) in Ethiopia represents a crucial part of telecoms infrastructure, reducing costs, enabling lower latency, and improving efficiency compared to having digital services hosted abroad.

Historically, only Ethio Telecom, the Ministry of Innovation and Technology (MinT)⁵¹ and banks have had data centres. However, since the market was liberalised, there have been several new data centres built or announced by firms such as Raxio, Wingu.Africa and RedFox, located within Addis Ababa's ICT park. Additionally, Safaricom Ethiopia has built three data centres since their entry (see Annex A.2 for more details). These data centres are Tier III, but Safaricom Ethiopia has said it could deploy Tier IV (the highest standard) if the situation demands.⁵²

The Wingu.Africa data centre is set to host Addix, Ethiopia's first IXP.⁵³ This will enable internet service providers and content delivery networks to connect directly to one another locally rather than in a neighbouring country, reducing the distance internet traffic has to travel, thus reducing the cost and improving latency.

51 MinT, Services, available at <https://mint.gov.et/services/?lang=en>

52 Data centre tiers are defined by factors including redundancy levels, uptime guarantee, staff expertise and maintenance protocols. Tier III: 99.982% uptime. Tier IV: 99.995% uptime, with additional operational capacity and increased fault tolerance.

53 DCD, Wingu.Africa inaugurates Ethiopia data center, available at <https://www.datacenterdynamics.com/en/news/winguafrica-inaugurates-ethiopia-data-center>

There is, and will continue to be, an exchange of traffic with neighbouring countries. For this connectivity to be effective, it must extend internationally with sufficient capacity. Ethiopia's international connectivity comes from several international undersea cables accessible via land borders: three submarine cables landing in Djibouti, two cables landing in Sudan and two cables landing in Kenya. Lit international bandwidth capacity available to Ethiopian consumers has grown significantly (increasing ten-fold from 0.05 terabits per second (Tbit/s) in 2017 to 0.5Tbit/s in 2022). While Ethiopia lags far behind benchmarks in lit international bandwidth capacity (in 2022 Egypt had >10Tbit/s, while Kenya had >45Tbit/s), 39 per cent of this is still unused, so the infrastructure can support additional traffic growth.⁵⁴

2.3 Demand for connectivity

There is a growing demand for high-quality connectivity in Ethiopia. More people have taken up fixed and mobile services in recent years, with a particular emphasis on more advanced networks such as 4G. The demand from individual users has also increased, with greater traffic generated per user. As traffic on networks increases, further network deployment and therefore investment will be crucial to ensure quality of service meets approved standards and continues to improve.

Fixed networks

As in most markets, fixed telephone subscriptions in Ethiopia have been declining in recent years. In 2022, only 0.7 per cent of the population had a fixed telephone subscription.⁵⁵

On the contrary, the number of fixed broadband subscriptions has grown since liberalisation, although fixed broadband subscribers still accounted for less than 1 per cent of the population in 2022.⁵⁶ This growth is likely as a result of the reduced prices, however further growth may be constrained by limited infrastructure.

In addition to the growth in total number of fixed broadband subscribers, there has also been a migration towards faster speeds; from 25 per cent of fixed broadband subscriptions at 2–10 megabits per second (Mbit/s) with the remaining 75 per cent at 256 kilobits per second (kbit/s)–2Mbit/s in 2017, to 5 per cent of subscriptions at >10Mbit/s and 94 per cent of subscriptions at 2–10Mbit/s in 2022.⁵⁷ Both growth in number of subscribers and migration to faster speeds lead to the increase in traffic across the network.

0.7%

of the population have fixed
telephone subscriptions

⁵⁴ ITU, Datahub, available at <https://datahub.itu.int/>

⁵⁵ ITU, Datahub, available at <https://datahub.itu.int/>

⁵⁶ ITU, Datahub, available at <https://datahub.itu.int/>

⁵⁷ For reference, 99% of UK fixed broadband connections were greater than 10Mbit/s in 2022. Source: ITU, Datahub, available at <https://datahub.itu.int/> Mbit/s is a data transfer rate that equals 1000000 bits per second.

Mobile networks

A larger proportion of the population now has at least one mobile subscription, at 33.7 per cent as of 2023 (see Figure 9). This has grown over time, enabled by increased coverage and reduced prices.

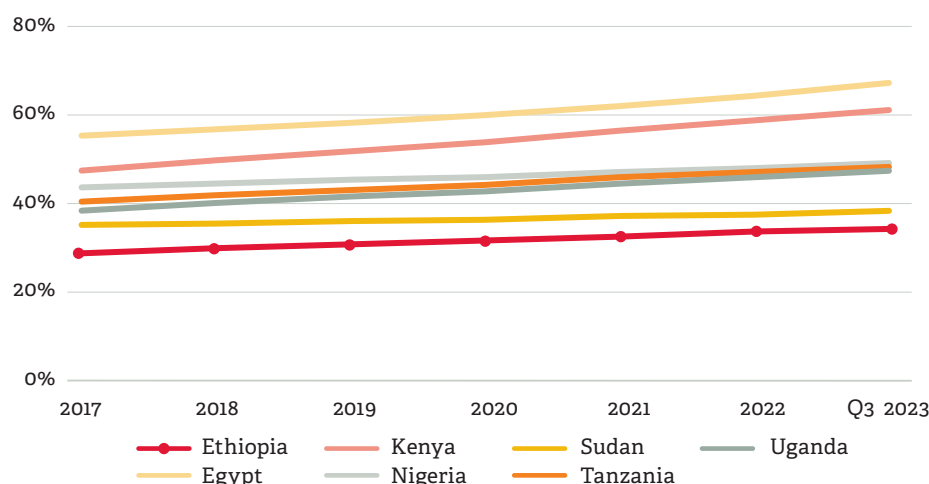


Figure 9: Market penetration of unique mobile subscribers [Source: GSMA Intelligence, 2024]

The total number of mobile subscriptions is much higher than fixed subscriptions, corresponding to 61 per cent of the population. This is approaching the Homegrown Economic Reform Agenda target of 88.4 per cent by 2025, and increased affordability and coverage will help the number of mobile subscriptions to continue to grow. There are nearly twice as many subscriptions as subscribers as most people have two SIM (Subscriber Identification Module) cards – the average number of SIMs per user has increased from 1.2 in 2018 to 1.8 as of Q3 2023.⁵⁸ This is likely due to consumers trying to get the best value for money by combining plans from the two different providers to benefit from any offers, potential differences in pricing, and differences in coverage. For instance, one impact of high MTRs (see Section 2.1) is that operators may charge a different price for on-network calls or texts (not subject to MTR) than for off-network calls or texts, so consumers may choose to have dual-SIM phones and a SIM for each network to minimise off-network calling.

It is worth noting that 3G and 4G account for an increasing share of mobile subscriptions (see Figure 10) which is likely due to increasing coverage and reduced prices. There are now more 3G subscriptions than 2G. However, 4G subscriptions lag behind benchmarks, for instance 8 per cent of Ethiopian subscriptions are for 4G compared to 35 per cent for Kenya. The planned expansion of Safaricom Ethiopia's network should support the take-up of 4G subscriptions by increasing 4G coverage.

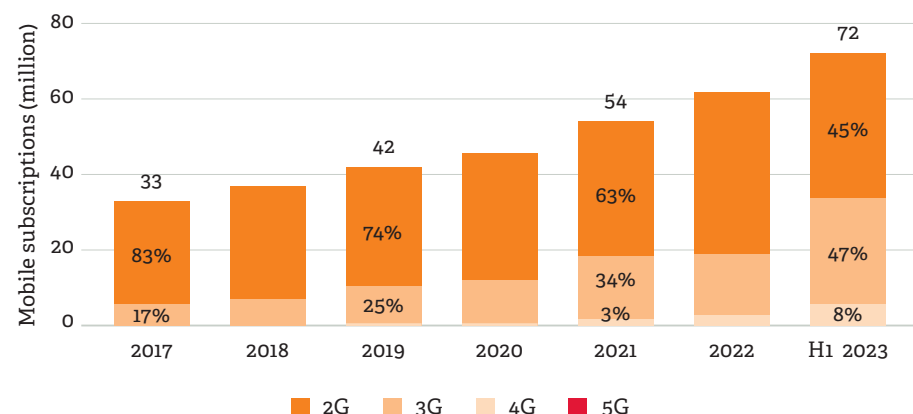


Figure 10: Mobile subscriptions by generation, Ethiopia [Source: TeleGeography]

⁵⁸ GSMA Intelligence, Data, available at <https://www.gsmainelligence.com/data/>

33.7%

of the population have at least one mobile subscription

1.8

SIMs per unique mobile subscriber in Q3 2023

In addition to supporting more subscribers, mobile networks also need to support an increasing level of traffic per subscriber for voice, SMS and data services.

In the year since its launch, Safaricom Ethiopia has found SMSs per customer have increased from 6.7 to 16.5 per month and voice minutes per customer have increased from 31.5 to 63.8 per month.⁵⁹ There is limited data available on Ethio Telecom's mobile voice and SMS traffic, however, its voice and SMS packages have grown over time, implying that demand has increased. For instance, the smallest available SMS package for Ethio Telecom has increased from 18 to 35 SMSs per day, while the smallest voice package has increased from 8 minutes to 15 minutes per day. Ethio Telecom also introduced 'unlimited' voice packages in 2021.

At 14.3GB per year in 2022, 3G+ mobile broadband traffic per subscriber in Ethiopia is not far behind benchmarks (20–35GB per year).⁶⁰ We note, however, that mobile broadband traffic has grown significantly in benchmarked countries in recent years as people spend more time on the internet and use more bandwidth-heavy applications. Ethiopian mobile broadband consumption appears to have started following this trend, as Safaricom Ethiopia found that data usage per customer increased from 0.8GB to 3.1GB per month in the year since launch.⁶¹ This is also shown by the fact that Ethio Telecom's data packages have grown over time. For instance, the smallest available data package has grown from 14 megabytes (MB) in 2018 to 100MB per day in 2023, and an 'unlimited' data package was introduced in 2019.

We also note that Ethiopia's use of international bandwidth has grown significantly from 27Gbit/s in 2017 to 307Gbit/s in 2022 which, while the lowest of benchmarked countries, still represents very significant growth.⁶²

About the quality of mobile data, GSMA Intelligence data reports that Ethiopia's network performance (an aggregation of upload speed, download speed and latency) was the weakest of the benchmarks in 2020, and has since steadily increased to a central position. In fact, recent testing of Safaricom Ethiopia's network in Addis Ababa found that 96 per cent of samples had a download throughput of greater than 10Mbit/s, with an average download throughput of 84.7Mbit/s and an average upload throughput of 42.2Mbit/s. Network performance affects not only customer satisfaction, but also the types of applications that can be used, which, in turn, affects their potential socioeconomic impact, so the introduction of this high-quality data service has the potential to unlock significant socioeconomic benefits.

As traffic increases, further network deployment, and therefore investment, will be crucial to ensure quality of service is not compromised and continues to improve. A supportive regulatory environment can promote this.

2.4 Digital technology adoption

While accessible connectivity (both in terms of price and coverage) is a key enabler of the take-up of digital services, consumer and enterprise customers cannot use digital services until they have smartphones and computers. Although in line with benchmarks, computer ownership is low and could improve. Mobile phone ownership is much higher, and is still growing. Ethiopia currently has a relatively low proportion of internet users, most of whom use it for information and entertainment. This is expected to grow, especially as affordability, coverage and adoption of internet-capable technologies increases.

59 Safaricom PLC, HY24 Investor presentation, available at <https://www.safaricom.co.ke/images/Downloads/H1-FY24-Investor-Presentation.pdf>

60 TeleGeography, GlobalComms Database, available at <https://www.telegeography.com/products/globalcomms/index.html>

61 Safaricom PLC, HY24 Investor presentation, available at <https://www.safaricom.co.ke/images/Downloads/H1-FY24-Investor-Presentation.pdf>

62 ITU, Datahub, available at <https://datahub.itu.int/>

Computers

In 2019, only 2.9 per cent of Ethiopian households owned a computer. This varied significantly with rurality with 8.7 per cent of urban households owning computers compared with 0.4 per cent of rural households.⁶³ This is in line with benchmarks, but shows significant room for growth. It also serves to highlight the divide between urban and rural connectivity.

Business access to computers is much higher than for households, with 46.9 per cent of firms having a computer,⁶⁴ though this is still significantly lower than for Egyptian (93.5 per cent) and Kenyan businesses (99.6 per cent).⁶⁵ Computer usage is significantly higher in large firms (92 per cent compared with 35 per cent in small firms), and in manufacturing firms (51 per cent compared with 25 per cent of agriculture and 5 per cent of service firms). Annex A.3 includes data on the adoption of advanced digital technologies, such as cloud computing, by firm size and sector.

Mobile phones

In 2023, 81.3 per cent of households have access to a mobile phone, a significantly higher proportion than computer ownership. Although historically the percentage of Ethiopian households with a mobile phone has lagged behind benchmarks, it has grown steadily in recent years to catch up with benchmarks (see Figure 11).

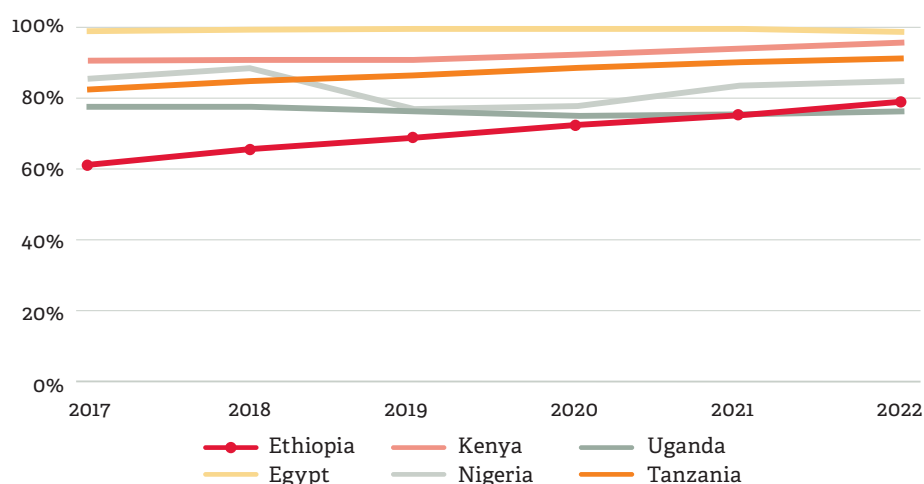


Figure 11: Percentage of households with a mobile phone [Source: Euromonitor]

In Ethiopia, these mobile devices are still mainly basic or feature phones, although smartphones do make up a growing portion at 43 per cent of unique mobile connections as of Q3 2023. This is at the lowest end of benchmarks which range from 50–55 per cent with the exception of Egypt (84 per cent) and Uganda (36 per cent).⁶⁶ This could be the result of high smartphone costs – representing 97 per cent of monthly GNI per capita in Ethiopia compared to 34.36 per cent in Kenya and 33.29 per cent in Nigeria.⁶⁷

Ownership rates vary across demographic groups (gender and rurality), highlighting digital inequalities (see Figure 12 and Figure 13). Benchmarks show similar inequalities, although to a lesser extent than in Ethiopia, showing the potential for further improvement in Ethiopia.

63 Cogent Education, Unpacking the equity of accessing the digital library and educational television channels for primary and secondary school students in Ethiopia, available at <https://www.tandfonline.com/doi/epdf/10.1080/2331186X.2023.2253052?needAccess=true>

64 World Bank, Understanding Firm-level Adoption of Technology in Ethiopia, available at <https://documents1.worldbank.org/curated/en/099224503082323138/pdf/P1741950f375a501b087c401179ec76fd29.pdf>

65 Euromonitor Passport, available at <https://www.euromonitor.com/our-expertise/passport>

66 GSMA Intelligence, Data, available at <https://www.gsmainelligence.com/data/>. Basic phones do not have any form of internet-access. Feature phones are mobile handsets allowing basic access to internet-based services but on a closed platform that does not support a broad range of applications. Smartphones are mobile handsets enabling advanced access to internet-based services and other digital functions.

67 GSMA, Mobile Money in Ethiopia: Advancing financial inclusion and driving growth, available at https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2023/06/GSMA_Mobile-money-in-Ethiopia-Advancing-financial-inclusion-and-driving-growth-report.pdf

2.9%

of households owned a computer in 2019

81.3%

of households have access to a mobile phone in 2023

In Kenya and Tanzania, programs that target women have helped to reduce the gender gap. For instance, Kenya’s Texting for Life application taught pregnant women how to send texts connecting them with emergency transport and healthcare.⁶⁸ Similarly, in Tanzania, there is a ‘Healthy Pregnancy, Healthy Baby’ campaign which targets pregnant women and mothers of young children.⁶⁹

Programs that target agriculture, such as the ‘Connected Farmer’ service in Tanzania,⁷⁰ or Nigeria’s Digital Agriculture Strategy,⁷¹ help to reduce the urban/rural divide.

Country	Proportion of male population	Proportion of female population	Male to female ratio
Ethiopia	69%	46%	1:0.67
Nigeria	90%	83%	1:0.92
Kenya	87%	78%	1:0.90

Figure 12: Proportion of population owning mobile handsets, by gender [Source: GSMA, 2023⁷²]

Country	Proportion of urban population	Proportion of rural population
Ethiopia	39%	10%
Nigeria	58%	32%
Kenya	56%	37%

Figure 13: Proportion of population owning smart phones, by rurality [Source: GSMA, 2023⁷³]

Despite the increasing take-up of mobile phone ownership and, in particular, smartphones, Ethiopia still lags behind benchmarks in terms of the percentage of the population using the internet via any device at 17 per cent in 2021 (see Figure 14). This apparent disconnect is explained by a number of barriers that mean some people with internet-enabled mobile devices still do not use mobile internet, such as affordability, lack of high quality 4G network coverage,⁷⁴ lack of literacy and digital skills, lack of relevance (such as insufficient local content) and security concerns.

17%

of the population using the internet in 2021

68 BMC, Texting for life: a mobile phone application to connect pregnant women with emergency transport and obstetric care in rural Nigeria, available at <https://bmcpregnancychildbirth.biomedcentral.com/articles/10.1186/s12884-023-05424-9>

69 International Food Policy Research Institute, Report, available at <https://www.ifpri.org/publication/external-evaluation-mobile-phone-technology-based-nutrition-and-agriculture-advisory>

70 MDPI, the Revolution of Mobile Phone-Enabled Services for Agricultural Development in Africa, available at <https://www.mdpi.com/2071-1050/12/2/485>

71 MDPI, Digital Agriculture Policies and Strategies for Innovations in the Agri-Food Systems, available at <https://oacps-ri.eu/wp-content/uploads/Paper-15-09192-4-003.pdf>

72 GSMA, The Mobile Gender Gap Report, available at <https://www.gsma.com/r/wp-content/uploads/2023/07/The-Mobile-Gender-Gap-Report-2023.pdf>

73 GSMA, The State of Mobile Internet Connectivity, https://www.gsma.com/r/wp-content/uploads/2023/10/The-State-of-Mobile-Internet-Connectivity-Report-2023.pdf?utm_source=website&utm_medium=button&utm_campaign=somic23

74 Although as explained in Sections 2.1 and 2.2 this is becoming less of an issue which we would expect to support an increase in future internet use.

Internet use is higher for men, with 20 per cent of the male population using the internet compared with 12 per cent of the female population. It is also higher in urban areas (33 per cent of adults in 2022) than in rural areas (6 per cent of adults in 2022), and greater among those with higher levels of education.⁷⁵

To achieve lower-middle-income level by 2025, as defined in Ethiopia's Homegrown Agenda, the proportion of internet users needs to grow by 9.7 percentage points to reach the target of 26.7 per cent. Improvements in affordability, coverage, demand and adoption of devices will be key to achieving this.

A higher proportion, 34 per cent, of firms have internet, although this number is significantly higher for large firms (80 per cent compared with 23 per cent for small firms). Agriculture firms' access to internet is significantly below average at 13 per cent compared with 40 per cent of manufacturing firms and 34 per cent of service firms. As a result, only 11 per cent of firms have a website and only 25 per cent use social media for business.⁷⁶

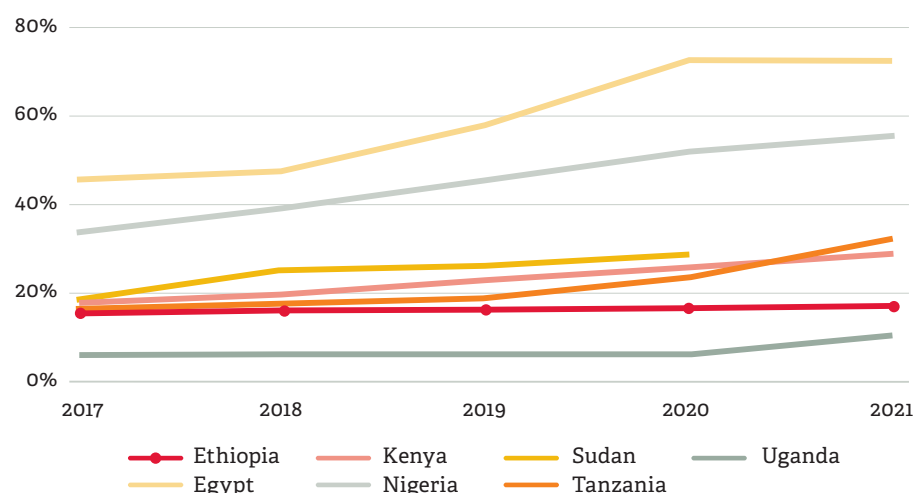


Figure 14: Internet users [Source: ITU Datahub]

In Ethiopia, Google is the most popular search engine, accounting for 95 per cent of the total traffic referred by search engines in December 2023.⁷⁷ As such, the most popular Google search topics of 2023 provide an insight into what the internet is currently being used for in Ethiopia. The top 15 search topics include country-specific information, videos, language translation, YouTube, sports betting and information, and Facebook.⁷⁸ Both Safaricom Ethiopia and Ethio Telecom offer data packages for specific services – TikTok, Telegram and WhatsApp are very popular services. In the next section, we discuss the developments in terms of access to the internet supporting the take up of e-commerce, business applications, government or socioeconomic services.

75 Research ICT Africa, Internet Development in Ethiopia, available at <https://documents1.worldbank.org/curated/en/650161570436992486/pdf/Concept-Project-Information-Document-PID-Ethiopia-Digital-Foundations-Project-P171034.pdf>

76 World Bank, Open Data, available at <https://data.worldbank.org/>

77 Statcounter, GlobalStats, available at <https://gs.statcounter.com/search-engine-market-share/all/ethiopia/#monthly-202301-202312>

78 GoogleTrends, Explore, <https://trends.google.com/trends/explore?geo=ET&hl=en>



3

Impact of digital connectivity

3.1 Socioeconomic benefits

Improvements in mobile network coverage and internet usage in other African markets have been shown to have positive impacts on labour markets, personal finance and health outcomes. We anticipate similar benefits for Ethiopia. For instance, digital connectivity can help achieve the Government's 2025 Homegrown Economic Reform Agenda targets.

In addition to providing information, entertainment and communication, digital connectivity has been shown to unlock various socioeconomic benefits. While socioeconomic outcomes are the result of complex and disparate factors, thereby making it difficult to identify the impact of digital connectivity in isolation, a growing body of research has found evidence of many benefits ranging from improved employment and productivity to better education and health.

Impact of improved connectivity on employment

A 2022 paper on 'The Employment Effects of Mobile Internet in Developing Countries' found that increasing 3G coverage by 10pp:⁷⁹

- Increases labour force participation (LFP) by 2.8pp (driven entirely by increased women LFP).
- Increases employment rate by 2.1pp (3.1pp for men, 1.3pp for women).
- Increases wage employment by 0.7pp (driven by increased wage employment in the service sector).
- Decreases the fraction of individuals in unpaid jobs by 0.86pp (however this is driven by males at 2.4pp, the female portion increases by 0.6pp).

Likewise, a 2020 study into 3G availability in Senegal between 2011–2018, found that 3G availability was associated with 4.5 per cent higher formal employment than in uncovered areas.⁸⁰

⁷⁹ The Employment Effects of Mobile Internet in Developing Countries (Yale University Press), available at <https://cpb-us-w2.wpmucdn.com/campuspress.yale.edu/dist/6/3741/files/2022/12/MobileInternet.pdf>

⁸⁰ World Bank, Broadband Internet and Household Welfare in Senegal, available at <https://openknowledge.worldbank.org/server/api/core/bitstreams/2236c76d-a325-509a-80e4-4939e864fc43/content>

A 2019 study looked at the more general impact of ‘fast internet’ using the arrival of submarine cables on the coast of Africa from Europe as a means of separating causation from correlation. Individuals and firms within 0.5km of the terrestrial internet backbone were more likely to be employed, and more likely to hold a skilled job, than those 0.5–10km from the backbone.⁸¹

Impact of improved connectivity on firm productivity and innovation

It is difficult to isolate the impact of connectivity on national growth rates, but easier to see the impact on improving firm productivity, which underpins economic growth. A 2024 paper, entitled ‘The Economic Impact of Internet Connectivity in Developing Countries’,⁸² provides a comprehensive review of literature on the supply-side and demand-side impacts of internet connectivity, including the impact on firms. The paper finds that a range of studies show better connectivity is associated with technological upgrading and higher labour productivity in firms, and that firms also benefit from using the internet to find new customers. It also reviews the impact of the internet on public sector effectiveness and the overall, macro-level impact of internet connectivity. The potential impacts of digitalisation on firms and the economy are also explored in the IFC report “Digital Opportunities in African Businesses”.⁸³

A 2022 study on ‘The Impact of Internet Access on Innovation and Entrepreneurship in Africa’ found that access to the internet increases the probability of a firm undertaking process innovation by 20pp and product innovation by 12pp.⁸⁴ Another study looked at firm performance in Ethiopia specifically, focusing on the period following the introduction of 3G in 2008 and found that firms’ labour productivity increased by 23.3 per cent in areas with mobile internet access (proxied by increased spending on mobile above the median) between 2008–2014.⁸⁵ These studies suggest that further increasing internet take-up in Ethiopia could improve firm productivity and innovation.

The impact of improved connectivity on agriculture firms should be especially significant, given that it is the sector that employs most of the working Ethiopian population. However, a number of studies have investigated this impact with mixed results. For example, a 2021 World Bank paper provides an extensive review of relevant literature, covering topics including on-farm productivity, market access, and environmental sustainability.⁸⁶ While a number of the reviewed studies show that improved agricultural technologies could increase yields, other studies did not find systematic evidence of yield increases, suggesting that the impact depends on the context. Likewise, some studies found farmers using mobile-based market information received higher prices for produce, but other studies found no significant effect of digital technologies on prices. It is also worth noting that take-up of digital agriculture tools is limited in Africa currently,⁸⁷ so understanding of the specific impact in an African context is limited.

81 American Economic Review, The Arrival of Fast Internet and Employment in Africa, available at <https://jhjort.github.io/MyWebsite/aer.20161385.pdf>

82 Hjort and Tian, The Economic Impact of Internet Connectivity in Developing Countries, available at https://jhjort.github.io/MyWebsite/Internet_Connectivity_Jan2024.pdf

83 Cruz, Marcio; editor. 2024. Digital Opportunities in African Businesses. Washington, DC: World Bank. <http://hdl.handle.net/10986/41447>

84 World Bank, The Impact of Internet Access on Innovation and Entrepreneurship in Africa, available at <https://openknowledge.worldbank.org/server/api/core/bitstreams/5cb7fdd3-ea2e-5392-b6d5-77baec4dbb9a/content>

85 World Bank, Mobile Access Expansion and Price Information Diffusion, available at <https://documents1.worldbank.org/curated/en/230161629725057008/pdf/Mobile-Access-Expansion-and-Price-Information-Diffusion-Firm-Performance-after-Ethiopia-s-Transition-to-3G-in-2008.pdf>

86 World Bank, What’s Cooking: Digital Transformation of the Agrifood System, available at <https://documents1.worldbank.org/curated/en/417641615957226621/pdf/Whats-Cooking-Digital-Transformation-of-the-Agrifood-System.pdf>

87 Science Direct, Digital tools and agricultural transformation in Africa, available at <https://www.sciencedirect.com/science/article/pii/S0306919223000374>

Impact of improved connectivity on the economy

In benchmark markets Nigeria⁸⁸ and Tanzania,⁸⁹ the World Bank undertook studies⁹⁰ to isolate the connectivity benefits to the economy on an individual and household level. A household was considered 'covered' if it received at least a medium-strength 3G signal.

The studies focused on household consumption and poverty status as their welfare outcomes. They found the following:

- Mobile data coverage boosts household consumption in both Tanzania and Nigeria by >7 per cent.
- Nigeria saw a 6.9pp decrease in the number of households below the \$1.90/day poverty line in areas that had 3G coverage after at least three years of coverage, compared to uncovered areas.
- In Tanzania, areas with mobile data coverage saw a 6pp reduction in the basic needs poverty rate.⁹¹
- The Tanzanian study also found greater consumption and poverty benefits were observed for female-headed households.

A similar study was conducted for Senegal, which found that between 2011–2018:⁹²

- Total consumption among households with 3G availability was 14 per cent higher than among non-covered households; this was greater (26 per cent) for non-food consumption.
- Households with 3G availability also exhibited 10 per cent lower extreme poverty rate than households without coverage.

Though no such study has been performed to date in Ethiopia, the findings in Nigeria, Tanzania and Senegal suggest that access to mobile connectivity, particularly higher quality data connectivity, could be expected to bring similar benefits to Ethiopia's uncovered, or recently covered population.

There is some evidence that the impact of better connectivity is visible in national and regional growth rates. For example, a 2021 study looking at both developing and developed markets worldwide found that a 10pp increase in 2G and 3G mobile penetration is associated with a 2.1–3.6 per cent increase in GDP (proxied by night-time light data captured by satellite imagery).⁹³ Another study that exploits the arrival of subsea cables, in this case via how they affect the connection of remote towns in Africa, found a significant (2pp) impact on the economic growth rate of connected towns in comparison to similar but unconnected towns.⁹⁴

6%+

decrease in poverty rate after at least three years of 3G coverage

88 World Bank, The Welfare Effects of Mobile Broadband Internet, available at <https://documents1.worldbank.org/curated/en/626011588705072099/pdf/The-Welfare-Effects-of-Mobile-Broadband-Internet-Evidence-from-Nigeria.pdf>

89 World Bank, Mobile Broadband Internet, Poverty and Labor Outcomes in Tanzania, available at <https://documents1.worldbank.org/curated/en/457061629220877366/pdf/Mobile-Broadband-Internet-Poverty-and-Labor-Outcomes-in-Tanzania.pdf>

90 In each market, three waves of nationally-representative surveys were performed over five–six years. These were compared to geographical mobile broadband coverage, calculated on the basis of a radio propagation model using infrastructure data from the largest mobile network operators, alongside terrain profile and vegetation data. To isolate the benefits from connectivity, control households were selected for having similar pre-coverage trends. To avoid the potential bias from operators targeting coverage in prosperous areas, regional trends were considered alongside household effects. Causality checks were also performed.

91 This is the cost of buying 2,200 calories per adult per day, plus the average non-food consumption of the population whose total consumption per adult is in the bottom 25%.

92 World Bank, Broadband Internet and Household Welfare in Senegal, available at <https://openknowledge.worldbank.org/server/api/core/bitstreams/2236c76d-a325-509a-80e4-4939e864fc43/content>

93 SSRN, Mobile Phones and Local Economic Development: A Global Evidence, available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3811765

94 Goldbeck and Lindlacher, Digital Infrastructure and Local Economic Growth: Early Internet in Sub-Saharan Africa, available at https://congress-files.s3.amazonaws.com/2022-07/paper_lindlacher.pdf

Increasing internet use also increases international trade: a 2004 study of 27 developed and 66 developing countries found that a 1pp increase in the number of internet users was correlated with a 4.3pp increase in exports.⁹⁵

Impact of improved connectivity on welfare

Improved connectivity has also been shown to benefit an individual's welfare (for example, education or health). For instance, an experiment conducted in Niger found that adult students taught to use simple mobile phones achieved test scores that were 0.19–0.26 standard deviations higher than those in standard adult education classes.⁹⁶ With respect to health, a 2022 paper found that in Africa, a 10pp increase in mobile network coverage:⁹⁷

- increased the probability of child survival by 0.45pp (driven primarily by access to 2G mobile network coverage);
- increased vaccination rates for measles and pneumonia vaccines by 2.6–2.9pp and 2.4–5.1pp, respectively;
- increased uptake of vitamin A supplements by 4.5–6.5pp; and
- was associated with an increase of 1.7–2.2pp in utilisation of prenatal care in a health centre.

Potential Ethiopian impact

As it stands, despite an 8 per cent compound annual growth rate over 2018–2022, Ethiopia's GDP per capita is still towards the lower end of benchmarks (see Figure 15), and would need to double to reach the Homegrown Economic Reform Agenda target of \$2,219 per capita (a lower-middle income level) by 2025.

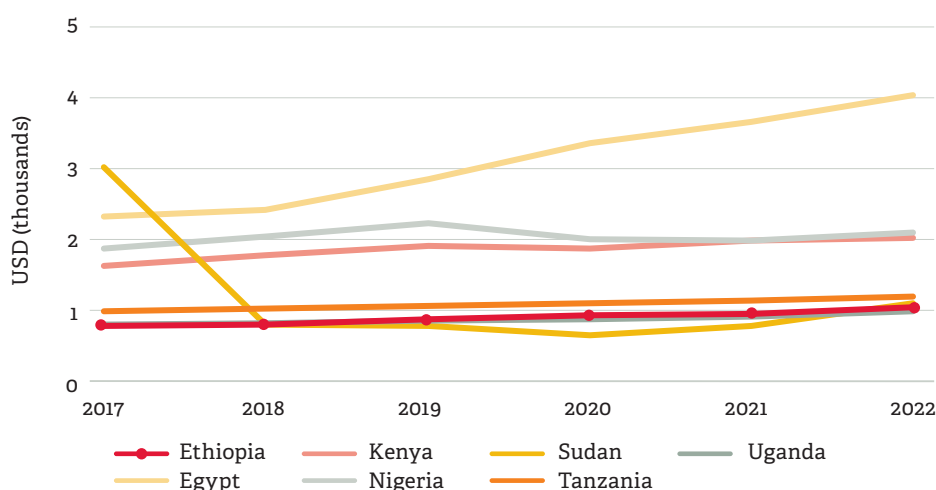


Figure 15: GDP per capita [Source: World Bank]

The above information shows Ethiopia's potential for further growth at a national level. As set out in Section 1.1, there is also potential for improvement at an individual level, both financially and in terms of welfare. As such, it makes sense to focus on how connectivity benefits specific parts of the economy and society. The following sections first address mobile money in Section 3.2 before discussing wider digital services targeting specific sectors in Section 3.3.

⁹⁵ World Bank, Has the Internet Increased Trade? Evidence from Industrial and Developing Countries, available at https://documents1.worldbank.org/curated/en/666781468778206389/108508322_20041117151016/additional/wps3215internet.pdf

⁹⁶ American Economic Association, Can Mobile Phones Improve Learning? Evidence from a Field Experiment in Niger, available at <https://www.aeaweb.org/articles?id=10.1257/app.4.4.94>

⁹⁷ World Bank, Saving Lives through Technology, available at <https://documents1.worldbank.org/curated/en/394931647888314925/pdf/Saving-Lives-through-Technology-Mobile-Phones-and-Infant-Mortality.pdf>

3.2 Mobile financial services

One way in which mobile connectivity can improve financial inclusion and fiscal stability, is by enabling MFS. MFS include not only mobile-enabled payments ('mobile money') between individuals (such as payments for goods and services, remittances), from employers (salaries) or from the government (for example, agriculture subsidies or welfare payments) but also additional mobile banking services such as savings and transfers via a digital wallet rather than a bank account. Ethiopia's mobile money market is nascent and has a clear opportunity to grow, both in terms of the number of users and the value of transactions. Safaricom's M-PESA (launched in Ethiopia in August 2023) has been instrumental in improving financial inclusion in Kenya, and could do the same for Ethiopia in tandem with Ethio Telecom's Telebirr.

As only 46 per cent of the population age 16 and over in Ethiopia had an account with a financial institution, and only 11.2 per cent used a credit card in 2022, MFS can be expected to play a key role in improving financial inclusion and stability.⁹⁸

Although banks have offered mobile banking services since 2015, it was only in 2020, as part of the telecoms market liberalisation, that network operators were allowed to provide these services.

Ethio Telecom launched Telebirr in 2021, with use cases including cash withdrawals and deposits, payment for goods and services, and money transfers. Ethio Telecom had amassed nearly 40 million Telebirr customers by May 2023 who have generated more than \$25 billion in transaction value.⁹⁹

Safaricom Ethiopia launched M-PESA in Ethiopia in August 2023, offering use cases including deposits, withdrawals, transfers and payments. In the one month following launch, Safaricom Ethiopia registered 1.2 million customers, who completed 2 million transactions at a value of more than \$250 million.¹⁰⁰ Since then, customer numbers have grown to approximately 5.8 million registered users to date.

To encourage take-up, both operators offer users rewards such as bonus on-net minutes or data. The expected inclusion of M-PESA as a way to make payments across all utilities, including fuel at petrol stations, should also encourage take-up.

Because mobile money is so new in Ethiopia, the country is behind our benchmark countries on all metrics.¹⁰¹ For instance, according to the International Monetary Fund (IMF) there were 30 mobile money accounts registered per 100 adults in 2022, but only 139 mobile money agents per 1,000km², and the value of mobile money transactions amounted to less than 1 per cent of GDP. Increasing the density of registered mobile money agents in line with benchmarked markets would likely help to increase mobile money account uptake and spending. We note that in other markets there was significant growth in these metrics in a short space of time, so Ethiopia could quickly catch up to benchmarks, especially if supported by initiatives such as increased integration with government service providers.

Safaricom Ethiopia intends to roll out a full M-PESA toolbox to ignite a digital payments ecosystem, with a range of consumer and merchant payment services and plans to look into additional financial services such as overdrafts, group savings, micro savings, micro credit, loan marketplace and wealth management. Safaricom's M-PESA has been instrumental in improving financial inclusion in Kenya (see Box 2) and could do the same for Ethiopia, in tandem with Ethio Telecom's Telebirr.

46%

of adult Ethiopians have an account with a financial institution

40 million

Telebirr customers as of May 2023

1.2 million

M-PESA customers by the end of its first month, growing to 5.8 million customers to date

30

mobile money accounts per 100 adults in 2022

98 World Bank, Global Findex, available at <https://www.worldbank.org/en/publication/globalfindex/Data>

99 Ethio Telecom, telebirr, <https://www.ethiotelecom.et/telebirr/>

100 Safaricom PLC, HY24 Investor presentation, available at <https://www.safaricom.co.ke/images/Downloads/H1-FY24-Investor-Presentation.pdf>

101 IMF, Financial Access Survey, available at <https://data.imf.org/?sk=e5dcab7e-a5ca-4892-a6ea-598b5463a34c>

MFS support the formalisation of markets as the use of digital currency can help to reduce the support for the parallel market for hard currency for local and international transfers (such as remittances) can be sent directly to the user through mobile money rather than an exchange on the black market. Eventually, this dampens the trade happening in the informal markets. Mobile money also creates a digital trail that makes taxation easier.

GSMA forecasts up to 2030 indicate that a high adoption of mobile money in Ethiopia could lead to a real GDP increase of \$5.3 billion, an increase of nearly 5 per cent, and a poverty reduction for 0.7 million people.¹⁰²

5%

increase in GDP by 2030 if adoption of mobile money is high

Box 2: Benefits of M-PESA and other mobile money services in Kenya

Safaricom introduced M-PESA in Kenya in 2007. It was the first mobile money service in the country, and, although other operators launched competing services, M-PESA dominated the market – by 2016, 96 per cent of Kenyan households had at least one member using M-PESA. The following socioeconomic benefits have been attributed to M-PESA and mobile money more widely:¹⁰³

- Financial inclusion (defined as access to formal financial services) of the Kenyan population increased from 26.7 per cent in 2006 to 82.9 per cent in 2019.
- Consumption among M-PESA users is unaffected by negative income shocks, whereas non-users experience a 7 per cent drop in consumption.
- Between 2008 and 2016, M-PESA lifted 2 per cent of households out of extreme poverty (\$1.25 per day), with stronger impacts for female-headed households.
- Being an M-PESA user increases the likelihood of having at least some savings by 20 per cent.
- M-PESA users are 16–22 per cent more likely to report that they save regularly.
- In 2013, in rural Kenya, M-PESA users saved, on average, \$2.74–3.72 more per household member, corresponding to 15–21 per cent of the self-reported average monthly earnings per household member.
- Between 2008 and 2016, mobile money services helped an estimated 185,000 women move from farming to business occupations.
- Between 2008 and 2016, long-term consumption grew by 8.5 per cent among those living in areas with high densities of mobile money agents.

Mobile money in Kenya has evolved over time to include savings accounts, credit services, and cross-border payments. For instance, the M-Shwari service allows consumers to open a bank account, transfer and withdraw with M-PESA, and request a loan with a credit scoring algorithm. This increased credit access helped consumers deal with health shocks in particular, as well as increasing spending on education. The credit system also helps small- and medium-sized businesses to access working capital loans.

¹⁰² GSMA, Mobile Money in Ethiopia, available at https://www.gsma.com/solutions-and-impact/connectivity-for-good/mobile-for-development/wp-content/uploads/2023/06/GSMA_Mobile-money-in-Ethiopia-Advancing-financial-inclusion-and-driving-growth-report.pdf

¹⁰³ <https://news.mit.edu/2016/mobile-money-kenyans-out-poverty-1208>, GSMA, Mobile Money in Ethiopia: Advancing financial inclusion and driving growth, available at https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2023/06/GSMA_Mobile-money-in-Ethiopia-Advancing-financial-inclusion-and-driving-growth-report.pdf and Researchgate, A Digital Financial Services Revolution in Kenya: The M-Pesa Case Study, available at https://www.researchgate.net/publication/349683376_The_M-Pesa_Case_Study_The_M-Pesa_Case_Study_A_Digital_Financial_Services_Revolution_in_Kenya_The_M-Pesa_Case_Study/link/62871dc46e41e5002d3343ba/download?tp=eyJjb250ZXhoIjpmZpcnNoUGFnZSI6InB1YmV2FoaW9uIiwicGFuZSI6InB1YmV2FoaW9uIn19

3.3 Digital services

Beyond MFS, there are other targeted digital services that can unlock specific socioeconomic benefits. In turn, we will discuss the status of digital identity (ID), digital health, digital education and digital agriculture in Ethiopia, and highlight the role that connectivity providers have in supporting the success of these services beyond just supplying the necessary connectivity.

Digital ID

To establish proof of identity to access government support, and unlock the associated socioeconomic benefits, Ethiopia needs a unique, centralised identification system.

Kebele ID is the current most widely-adopted ID document in Ethiopia, understood to be held by most adults. However, records are not centralised and the cards are not standardised in terms of the information on them, their appearance, the qualification requirements and the cost, and are therefore vulnerable to forgery.¹⁰⁴

Digital ID is recognised as one of the three key enabling systems within the Digital Ethiopia 2025 strategy, and it offers a solution to the lack of centralisation and standardisation of Kebele ID.¹⁰⁵

In April 2022, Safaricom Ethiopia and National ID Ethiopia signed a Memorandum of Understanding enabling the set-up of joint pilots for registration and integration of electronic know your customer (e-KYC) – a digital process for customer identity verification. Executive Director of NID Yodahe Zemichael said “with the National ID Programme we aim to cover up to 70 million people by the end of 2025 and accelerate the growth of the digital economy”.¹⁰⁶

In March 2023, Ethiopia passed the Digital Identity Proclamation Bill, joining African nations, including Kenya and Uganda, in transitioning to digital ID. This is known as Fayda ID, which will replace Kebele ID and become compulsory for banking services.¹⁰⁷ The Fayda ID programme has been issued \$350 million in World Bank funding (\$50 million of grant and \$300 million of International Development Association credit) to supplement public investment.¹⁰⁸ Other potential future use cases of digital ID include accessing welfare, including services such as education and healthcare.

Digital health

Improving healthcare provision and access is an important part of advancing Ethiopia's development. As part of the Ministry of Health's (MoH) first Health Sector Transformation Plan (HSTP, 2015–2020), the Information Revolution (IR) agenda identified two priorities: enhancing the culture of information use for decision making, and implementing and scaling up health information systems and tools. These are supported by a national IR roadmap (2016–20) and continue to be priorities in the second HSTP (2020–25). A number of digital health solutions have already been implemented.¹⁰⁹

- The Health Management Information System (HMIS) supports routine collection, analysis and presentation of health data.

¹⁰⁴ World Bank Group, ID4D Country Diagnostic: Ethiopia, available at <https://documents1.worldbank.org/curated/en/822621524689442102/ID4D-Country-Diagnostic-Ethiopia.pdf>

¹⁰⁵ MinT, Digital Ethiopia 2025 – Summary, available at https://www.lawethiopia.com/images/Policy_documents/Digital-Ethiopia-2025-Strategy-english.pdf

¹⁰⁶ Safaricom, News, available at <https://safaricom.et/index.php/news-insights/4-safaricom-telecommunications-ethiopia-plc-partners-with-national-id-ethiopia-to-enhance-digital-kyc>

¹⁰⁷ TechCabal, Digital IDs are coming to Ethiopia, available at <https://techcabal.com/2023/09/08/ethiopia-set-to-launch-digital-ids/>

¹⁰⁸ World Bank, News, available at <https://www.worldbank.org/en/news/press-release/2023/12/13/world-bank-supports-afe-ethiopias-digital-id-project-to-increase-access-to-services-and-economic-opportunities>

¹⁰⁹ Ministry of Health Ethiopia, Information Revolution Five Year Progress Report, available at https://publications.jsi.com/JSIInternet/Inc/Common/_download_pub.cfm?id=24601&lid=3

- The Electronic Community Health Information System (eCHIS) is a mobile platform that collects demographical data and health services delivery information, currently used by 1,250 health posts.
- Electronic medical records are deployed in over 450 antiretroviral therapy sites, maintaining patient records of people living with HIV.

A World Bank report estimates that current MoH spending, at \$11.6 million, is less than 4 per cent of the required spending on enhancing digital health (\$349.7 million).¹¹⁰

Telecoms companies are supporting the efforts to realise digital health. Safaricom Ethiopia provides a register of contact data and special numbers for healthcare providers, and has committed to providing free app-based neo-natal and post-natal advice, which should help decrease infant mortality rates.

The MoH has also been collaborating with Ethio Telecom to provide internet connection to health facilities via HealthNet, a virtual private network service. So far over 3500 health institutions have been connected to HealthNet.¹¹¹

Digital education

Digital services can play an important role in improving the quality of and access to education. The Covid-19 pandemic in particular highlighted both the importance of remote education and how it can work effectively. Historically, the Ministry of Education (MoE) has relied on a satellite-based system to deliver video content to schools, which is slow, expensive, and not interactive.¹¹² Initiatives including WoredaNet, GEQIP and Digital Smart Schools, have started to equip schools with computers connected to the internet.¹¹³ However, as of 2021, fewer than 10 per cent of secondary schools and only 50 out of around 1,500 higher education and research institutions were connected.¹¹⁴

In this context, Safaricom Ethiopia is dedicated to help improve digital literacy and increase the prevalence of digital skills in Ethiopia. According to Safaricom Ethiopia's Chief Executive Officer (CEO) Wim Vanhelleputte, "We have the youth at the centre of our drive towards the realisation of digital Ethiopia and we have programmes geared towards that end. Our Discover Graduate Management and Software Development Training Programmes create a pool of talent of digital innovators. The Discover Graduate Management Programme recruits fresh graduates from universities across the country and nurtures them into becoming digital innovators who will grow with the business."¹¹⁵ As one of its first initiatives, Safaricom Ethiopia, with the support of Japan International Cooperation Agency and Gebeya Talent, launched in September 2023 a six-month software development training programme targeted at computer science and science, technology, engineering and mathematical university graduates. This was in line with Safaricom Ethiopia's 'Transforming Ethiopian Lives for a Digital Future' goal, aimed at supporting young talent within the framework of the governmental programme 'Digital Ethiopia 2025'.¹¹⁶

¹¹⁰ The World Bank, Ethiopia Digital Technologies in Education, Health and Social Protection, available at <https://documents.worldbank.org/en/publication/documents-reports/documentdetail/099062123091010544/p179917087f4350d3090de0d513466f2958>

¹¹¹ Ministry of Health Ethiopia, Information Revolution Five Year Progress Report, available at https://publications.jsi.com/JSIInternet/Inc/Common/_download_pub.cfm?id=24601&lid=3

¹¹² The World Bank, Project Appraisal Document, available at <https://documents1.worldbank.org/curated/en/421681619316030132/pdf/Ethiopia-Ethiopia-Digital-Foundations-Project.pdf>

¹¹³ International Labour Organization, Digitalization in teaching and education in Ethiopia, available at https://www.ilo.org/wcmsp5/groups/public/---ed_dialogue/---sector/documents/publication/wcms_783664.pdf

¹¹⁴ The World Bank, Project Appraisal Document, available at <https://documents1.worldbank.org/curated/en/421681619316030132/pdf/Ethiopia-Ethiopia-Digital-Foundations-Project.pdf>

¹¹⁵ Safaricom, Press Release, available at <https://www.safaricom.co.ke/media-center-landing/press-releases/safaricom-telecommunications-ethiopia-plc-gears-up-for-commercial-launch>

¹¹⁶ Safaricom, News, available at <https://safaricom.et/index.php/news-insights/99-safaricom-ethiopia-japan-international-cooperation-agency-and-gebeya-talent-jointly-launch-software-development-training-program>

Digital agriculture

In 2022, agriculture employed more than 65 per cent of Ethiopia's population, contributed 22.9 per cent to GDP growth, and comprised 40 per cent of total GDP and 80 per cent of foreign earnings.¹¹⁷ Despite its significance to Ethiopia's economy, agriculture remains largely manual. Low-sophistication technologies are occasionally used to enhance farm productivity (for example, crop rotation, weather forecasting), and for market information services. A World Bank survey of 1,476 firms in Ethiopia found that none reported use of precision agriculture via internet of things (IoT).¹¹⁸

Digital agriculture has been shown to provide benefits to farmers in benchmark markets and elsewhere in sub-Saharan Africa.

- A study on the use of personalised advice for rice farmers over a mobile application in Nigeria found that it improved yield and profit by 7 per cent and 10 per cent respectively, without an increase in average fertiliser use.¹¹⁹
- A study on the use of mobile phones in Tanzania found that 67 per cent of farmers surveyed reported increased profits from use.¹²⁰
- A study on the use of mobile phones in Niger found that searching for price information reduced costs by 50 per cent compared to the alternative cost of personal travel.¹²¹
- Evidence based on a meta-analysis of six studies shows that the transmission of agricultural information through mobile technologies has increased yields by 4 per cent in sub-Saharan Africa and India.¹²²

The Digital Ethiopia 2025 strategy includes a target to unlock value from agriculture by building a Digital Agriculture platform and by supporting entrepreneurship in the agricultural technology sector.¹²³ Other initiatives include, mapping soil resources and ground water, a National Market Information System, the 8028–farmer hotline, and the ATA Rural Financial Services. Precision agriculture and vertical farming are also expected to make an impact in the coming years, as emphasised in the Homegrown Economic Reform Agenda.

In this context, Safaricom Ethiopia's contributions include launching the Connected Farmer+ platform, connecting 3.3 million of the hardest-to-reach farmers with comprehensive digital services, and driving a higher return on investment through agricultural connectivity and digital services.

65%+

of the population work in agriculture

117 CGIAR, Digital Agriculture Profile: Ethiopia, available at <https://cgspace.cgiar.org/handle/10568/119309>

118 World Bank, Understanding Firm-level Adoption of Technology in Ethiopia, available at <https://documents1.worldbank.org/curated/en/099224503082323138/pdf/P1741950f375a501b087c401179ec76fd29.pdf>

119 American Journal of Agricultural Economics, One Size Fits All? Experimental Evidence on the Digital Delivery of Personalized Extension Advice in Nigeria, available at <https://doi.org/10.1111/ajae.12151>

120 PLOS, Mobile phone use is associated with higher smallholder agricultural productivity in Tanzania, East Africa, available at <https://doi.org/10.1371/journal.pone.0237337>

121 American Economic Association, Mobile Phones and Economic Development in Africa, available at <https://doi.org/10.1257/jep.24.3.207>

122 CGIAR, Digital Agriculture Profile: Ethiopia, available at <https://cgspace.cgiar.org/handle/10568/119309>

123 MinT, Digital Ethiopia 2025 – Summary, available at https://mint.gov.et/wp-content/uploads/2022/01/Summary_of_Digital_Strategy_Final_English1.pdf



4

Conclusions and future work

The liberalisation of the Ethiopian telecoms market commencing in 2019, and the subsequent introduction of competition through Safaricom Ethiopia's entry in 2021, have driven improvements in the affordability of telecoms services and coverage of more advanced technologies, thereby facilitating the growing demand for connectivity. Further infrastructure deployment and increased adoption of digital technology will increase access to, and take-up of, high-quality digital connectivity. This connectivity, in turn, is expected to unlock significant socioeconomic benefits for Ethiopia and its citizens, particularly when combined with the various digital services that the government is promoting and operators are supporting.

Mobile subscribers account for the vast majority of the Ethiopian telecoms market and, as such, the introduction of competition for mobile services has far-reaching impacts, driving operators to optimise their services to attract and retain customers. This is seen in the dramatic drop in the price of mobile data following market liberalisation – prices decreased by approximately 70 per cent across the board from 2017 to H1 2023 – and in the growth in mobile network infrastructure deployment, including significant Safaricom Ethiopia tower deployment and the doubling of 4G population coverage. As mobile traffic continues to grow, both through the addition of new users and through increased usage per individual, it is crucial that infrastructure deployment continues rapidly across the whole sector, to ensure that quality of service is not compromised. Furthermore, increasing rural coverage will be necessary to close the urban/rural digital divide. Tower sharing and TowerCos are two possible means of improving mobile infrastructure deployment.

While the internet is currently mostly used for information, entertainment and communication in Ethiopia, it can be used to unlock personal, labour, finance, health and education benefits. As the affordability and availability of connectivity and digital adoption increases, the proportion of internet users will grow, increasing the magnitude of the potential benefits which can be realised from digital developments supported by a more advanced and competitive telecoms market. Digital connectivity can help to further grow Ethiopia's economy to achieve the government's Homegrown Economic Reform Agenda targets. Safaricom Ethiopia's entry has kickstarted the creation of jobs in the digital sector including not only Safaricom Ethiopia's 872 employees but also more than 4,500 indirect jobs created through managed service and partners as well as new jobs in apps/fintech development, digital economy services, etc.¹²⁴ We would expect to see many more digital sector employees in the coming years from now, which would demonstrate the success of liberalisation in catalysing digital growth and economy.

It is crucial that the ECA continues to build strong regulatory foundations to support a healthy competitive market. Additionally, it is important to maximise the involvement of all stakeholders in digital development, with operators, government and private enterprises working together to introduce digital services for commerce and society. As part of this collaboration, telecoms policy should be regularly reviewed and updated to guide the ECA and support operators in further infrastructure deployment and connectivity provisioning. This will enable Ethiopia to realise the full benefits of digital connectivity and help carry Ethiopia into the future.

¹²⁴ Direct and indirect job creation is central to the socioeconomic impact of Safaricom and the liberalisation of the sector, but there is insufficient data available for accurate estimates for new jobs in apps/fintech development, digital economy services, etc. While gross job creation is important (the creation of new positions), equally important are changes to the nature and productivity of existing jobs.

Annex A: Supplementary tables

A1: Demographic and market information for Ethiopia and benchmarked countries

Metric	Ethiopia	Egypt	Kenya	Nigeria	Sudan	Tanzania	Uganda
Population (million)	107	111	54	219	47	65	47
Rural population	77%	57%	71%	46%	64%	65%	74%
Population aged <35 ¹²⁵	77%	65%	74%	76%	75%	77%	82%
Area (thousand km ²)	1129	995	569	911	1868	886	201
Population density (per km ²)	109	111	95	240	25	74	236
Employment in agriculture (% of total employment)	64%	19%	33%	35%	41%	64%	63%
Population in the largest city (% of urban population)	19%	46%	33%	13%	37%	31%	30%
Population in multi-dimensional poverty (% of population) ¹²⁶	68.7%	5.2%	37.5%	33.0%	52.3%	57.1%	57.2%

Table A.1: Demographic information for Ethiopia and benchmarked countries [Source: World Bank, UN, Ethiopian Statistical Service, 2023]

125 These are 2022 values not 2023.

126 Multidimensional poverty is based on a deprivation profile considering ten indicators across health, education and living standards. These are 2019 values for Ethiopia, and from 2014 or later for benchmarks.

Age Group	2013 Population			
	Urban		Rural	
	Male	Female	Male	Female
0–4	845,841	806,160	5,467,654	5,276,774
5–9	781,747	789,163	5,573,189	5,274,122
10–14	758,836	900,677	4,894,584	4,372,805
15–19	773,044	983,632	3,494,579	3,194,057
20–24	716,956	964,591	2,355,378	2,470,395
25–29	801,566	912,245	2,214,947	2,586,935
30–34	562,393	526,057	1,675,477	1,798,896
35–39	504,455	505,691	1,755,973	1,979,360
40–44	329,274	287,290	1,314,238	1,321,557
45–49	241,298	261,898	1,097,722	1,107,007
50–54	174,163	206,140	877,085	863,164
55–59	148,794	156,829	669,149	629,976
60–64	120,679	139,745	631,060	541,814
65+	250,887	276,883	1,304,526	974,793
Total	7,009,933	7,717,001	33,325,560	32,391,654

Table A.2: Ethiopia population by age, gender and rurality for 2013 [Source: International Labour Organization,¹²⁷ 2024]

¹²⁷ International Labor Organization, Labor force surveys, available at <https://www.ilo.org/surveyLib/index.php/catalog/LFS/?page=1&ps=15&repo=LFS>

Age Group	2021 Population			
	Urban		Rural	
	Male	Female	Male	Female
0–4	1,400,286	1,338,466	5,705,549	5,322,248
5–9	1,123,171	1,130,067	6,183,936	5,869,950
10–14	1,054,118	1,098,677	5,863,447	5,449,627
15–19	972,849	1,259,284	4,446,553	3,858,418
20–24	817,453	1,297,858	2,647,995	2,850,274
25–29	1,090,874	1,421,760	2,431,070	2,916,220
30–34	934,057	845,769	2,034,658	2,332,222
35–39	819,203	786,119	2,116,685	2,571,633
40–44	535,817	434,860	1,737,240	1,565,670
45–49	373,885	325,251	1,381,554	1,242,165
50–54	277,706	260,380	1,070,013	1,040,370
55–59	184,614	173,707	782,314	705,940
60–64	161,165	180,662	779,935	717,443
65–69	114,730	120,296	563,772	467,540
70–74	86,973	83,648	471,451	348,295
75+	128,067	138,315	898,510	695,363
Total	10,074,968	10,895,120	39,114,681	37,953,377

Table A.3: Ethiopia population by age, gender and rurality for 2021 [Source: International Labour Organization,¹²⁸ 2024]

128 International Labor Organization, Labor force surveys, available at <https://www.ilo.org/surveyLib/index.php/catalog/LFS/?page=1&ps=15&repo=LFS>

School level	2011	2016					2021
	Total	Male	Female	Urban	Rural	Total	Total
Primary school	63.9%	~71%	~73%	~86%	~70%	71.8%	88.7%
Secondary school	21.5%	~17%	~19%	~40%	~12%	30.7%	33.1%

Table A.4: Ethiopian school enrolment [Source: World Bank,¹²⁹ UNICEF¹³⁰]

Rurality	Total	Male	Female
Urban	73%	78%	68%
Rural	43%	50%	35%
Total	49%	56%	43%

Table A.5: Ethiopia literacy rate of population aged three and above, by gender and rurality for 2021 [Source: International Labour Organization, 2024]

Industry	Total			Urban			Rural		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
Agriculture	39%	49%	28%	7%	10%	4%	48%	60%	35%
Industry	4%	5%	2%	8%	13%	4%	2%	2%	2%
Services	11%	12%	9%	30%	36%	25%	5%	5%	5%
Other (households as employers or extraterritorial organisations)	7%	3%	10%	6%	3%	8%	7%	3%	11%
Total	60%	69%	50%	51%	62%	41%	62%	71%	53%

Table A.6: Ethiopia employment rate of population aged ten and above, by gender and rurality for 2021 [Source: International Labour Organization, 2024]

129 World Bank Group, Ethiopia Poverty Assessment, available at <https://documents1.worldbank.org/curated/en/992661585805283077/pdf/Ethiopia-Poverty-Assessment-Harnessing-Continued-Growth-for-Accelerated-Poverty-Reduction.pdf>

130 UNICEF, Learning and development, available at <https://www.unicef.org/ethiopia/learning-and-development>

Metric	Ethiopia	Egypt	Kenya	Nigeria	Sudan	Tanzania	Uganda
GDP per capita (current \$)	1028	4295	2099	2184	1102	1192	964
Fixed telephone subscriptions (per 100 people)	0.70	10.45	0.12	0.04	0.33	0.13	0.25
Mobile cellular subscriptions (per 100 people)	56.02	93.21	121.67	101.69	73.97	91.90	69.99
Proportion of prepaid connections Q3 2023	99%	84%	98%	94%	95%	94%	95%
Operators with >10% of subscriptions	2	4	6	4	4	6	6
Year second operator licensed	2021	1998	2000	1992	2004	1995	1998

Table A.7: Market information for Ethiopia and benchmarked countries [Source: World Bank, UN, Ethiopian Statistical Service, 2023]

A.2 Data centre announcements and launches

Date	Company	Event	Details
May 2021 ¹³¹	Ethio Telecom	Data centre inaugurated	800-rack Tier III data centre, replacing an existing data centre
December 2021	Safaricom Ethiopia	First data centre in Addis Ababa	1,000m2, 26-rack Tier III data centre
March 2022	Safaricom Ethiopia	Second data centre in Addis Ababa	1,000m2, 26-rack Tier III data centre
September 2022 ¹³²	Safaricom Ethiopia	Announced plans to upgrade first data centre	2,000m2, 52-rack Tier III data centre
September 2022 ¹³³	RedFox	Data centre went live	5,733m2
September 2022 ¹³⁴	RedFox	Announced plans for three modular data centres	N/A
June 2023 ¹³⁵	Wingu.Africa	Data centre inaugurated	15,000m2, 10MW, 800-rack Tier III data centre
October 2023 ¹³⁶	Safaricom Ethiopia	First data centre upgraded, third data centre delivered	10,000m2, 126-rack Tier III data centre in the ICT park
November 2023 ¹³⁷	Raxio Ethiopia	Data centre launched	2,000m2, 3MW, carrier-neutral, Tier III data centre located in the ICT park in Addis Ababa that can house up to 800 racks with 99.9% uptime
Planned ¹³⁸	ScutiX	N/A	N/A
Planned ¹³⁹	Sun Data World	N/A	N/A

Table A.8: Data centre announcements and launches after liberalisation [Source: Various, footnoted]

¹³¹ DCD, news, available at <https://www.datacenterdynamics.com/en/news/ethio-telecom-opens-new-huawei-built-modular-data-center-in-addis-ababa-ethiopia/>

¹³² DCD, news, available at <https://www.datacenterdynamics.com/en/news/safaricom-to-build-data-center-in-addis-ababa-ethiopia/>

¹³³ ENA, news, available at https://www.ena.et/web/eng/w/en_38441

¹³⁴ ENA, news, available at https://www.ena.et/web/eng/w/en_38441

¹³⁵ DCD, news, available at <https://www.datacenterdynamics.com/en/news/winguafrica-inaugurates-ethiopia-data-center/>

¹³⁶ Safaricom Ethiopia.

¹³⁷ Raxio, locations, available at <https://www.raxiogroup.com/locations/ethiopia/>

¹³⁸ DCD, news, available at <https://www.datacenterdynamics.com/en/news/raxio-launches-data-center-in-addis-ababa-ethiopia/>

¹³⁹ DCD, news, available at <https://www.datacenterdynamics.com/en/news/raxio-launches-data-center-in-addis-ababa-ethiopia/>

A.3 Adoption of technology by firms in Ethiopia

Technology	Mean	Business			Agriculture firms	Manufacturing firms	Service firms
		Small	Medium	Large			
Have a computer	47%	35%	83%	92%	25%	51%	5%
Number of computers	3.4	0.9	5.5	89.4	1.1	3.1	3.5
Have a smartphone	27%	24%	36%	42%	23%	33%	27%
Number of smartphones	0.8	0.5	1.3	5.5	0.5	1.1	0.8
Have internet	34%	23%	65%	80%	13%	40%	34%
Cloud computing	4.3%	1.9%	10.1%	32.7%	1.4%	9.3%	4.0%
Big data analytics/AI	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Robots	0.0%	0.0%	0.0%	0.3%	N/A	0.0%	N/A
Additive manufacturing /3D printing	0.0%	0.0%	0.0%	0.2%	N/A	0.0%	N/A
Other advanced manufacturing	1.2%	0.0%	0.0%	11.5%	N/A	1.2%	N/A
Precision agriculture (IoT)	0.0%	0.0%	0.0%	0.0%	0.0%	N/A	N/A

Figure A.9: Adoption of technology by firms in Ethiopia [Source: World Bank, 2022]¹⁴⁰

¹⁴⁰ World Bank, Understanding Firm-level Adoption of Technology in Ethiopia, available at <https://documents1.worldbank.org/curated/en/099224503082323138/pdf/P1741950f375a501b087c401179ec76fd29.pdf>

For further information:

► **British International Investment**

Paddy Carter
pcarter@bii.co.uk
Amelie Fabian
afabian@bii.co.uk
bii.co.uk/insight

