HORN OF AFRICA REGIONAL ECONOMIC MEMORANDUM BACKGROUND PAPER 6

Overview of Digital Development in the Horn of Africa

- Tim Kelly & Eric Dunand

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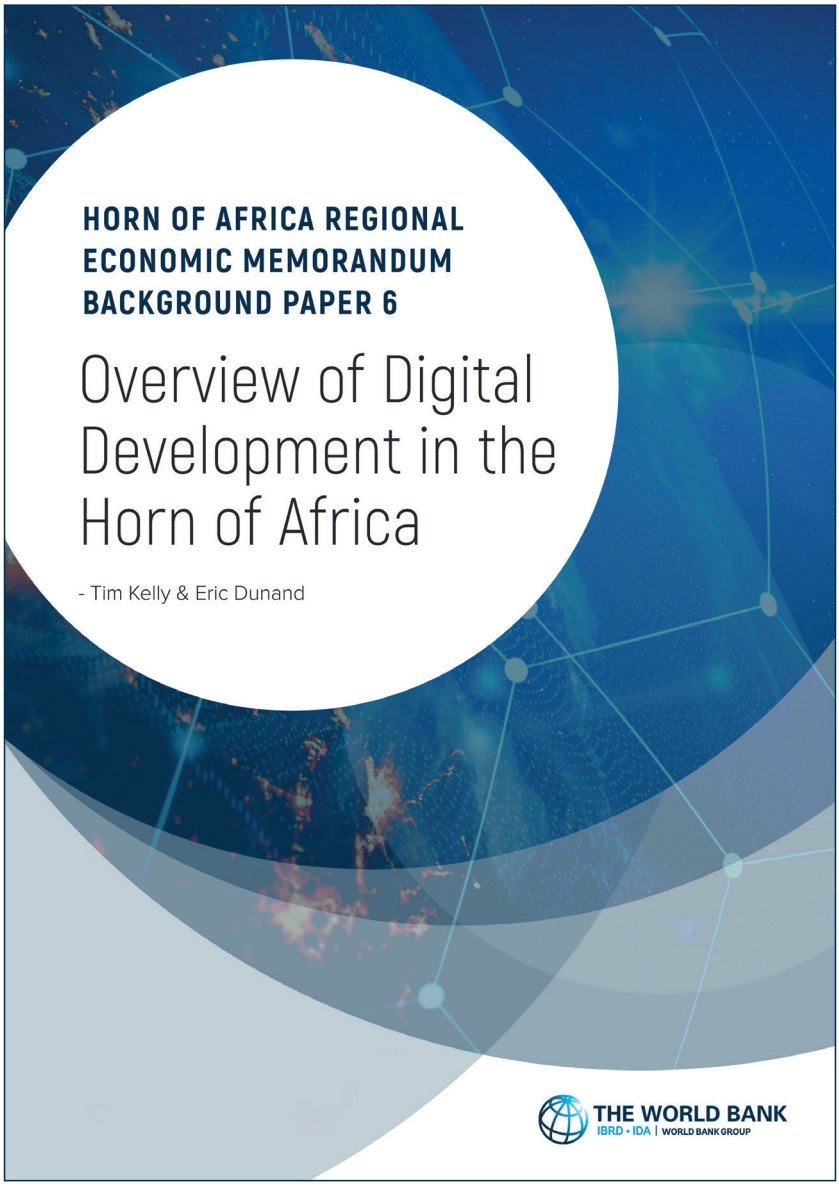


CONTENTS

SECTION 3

Digital Development

This section follows the World Bank Group's approach to Jobs and Economic Transformation (JET)[1] which identifies economic transformation as key to creating more and better jobs. It builds on the Digital Economy for Africa (DE4A) approach to developing a digital economy to create the jobs of the future,[2] which is aligned with the African Union's Digital Transformation Strategy, 2020-2030.[3] Helping countries build new digital infrastructure, and to develop regulations, skills and platforms that are compatible with neighboring countries should enable them to develop a larger and more efficient digital market that can facilitate economic transformation by enabling technological leapfrogging, and the creation of new jobs in old and new sectors. New forms of market connectivity can bring opportunities for new services and regional economic development in the HoA.

Figure 1: Policies and Investments to Create Productive Jobs Vary by Stage of Economic Transformation

	Commodities to simple manufacturing & services	Simple to advanced agriculture, manufacturing & services	Advanced agriculture manufacturing & services to innovative activities
4. Digital economy, technology and innovation	• ***Basic ICT connectivity***	• ***Advanced ICT services:*** Infrastructure, competitive markets (liberalized ICT services environment)	
	• ***Enabled ecommerce*** (digital id; eKYC etc.)	• ***Enabled digital markets:*** new business models, services and products, industry 4.0, market regulation 2,0 and expand GovTech	
	• ***Innovation:*** basic standards, technology adoption, agricultural productivity innovation policies		• ***Innovation:*** innovation ecosystem (R&D policy, industry-academia links)

Source: WB – IMF – JET September 18, 2019.

This section is prepared in the context of Covid-19 pandemic that threatens decades of hard-won development gains and is likely to have triggered the deepest global recession since the World War II. The economic crisis is generating massive unemployment, particularly affecting the poor and vulnerable, and highlights the importance of jobs and economic transformation. The HoA countries already faced the challenge of a population growth at a rate around 3% pre-Covid-19, and now need to address the health issue and the social and economic impacts.

Kenya was the first country to enter a Bank-facilitated procurement contract for urgent medical supplies and equipment to strengthen medical services and reduce the spread of the virus, as well as budget support to help close the fiscal financing gap while supporting reforms that help advance the government's

1 https://ida.worldbank.org/theme/jobs-and-economic-transformation.
2 https://www.worldbank.org/en/programs/all-africa-digital-transformation.
3 https://au.int/en/documents/20200518/digital-transformation-strategy-africa-2020-2030.

inclusive growth agenda. The HoA countries need to maintain a line of sight to their long-term development vision, which can be best achieved in cooperation and there has been no better time than now to accelerate the digital transformation in and between HoA countries to mitigate the impact of Covid-19.

3.1.1 Regulatory environment

An optimal ICT regulatory framework is critical to supporting the development of digital economies in the HoA. The deployment and use of the latest digital technologies, providing reliable infrastructure and affordable services to citizens, associated with infrastructure sharing, networks interconnection, quality of service indicators and effective use of scarce resources, in particular spectrum, allows to unlock the full potential of digital services. They can be a key driver for inclusion and can have a significant positive impact on consumers, businesses and governments. In adopting best practices policymakers / regulators can rely on a strong and agile regulatory framework necessary to adapt to and facilitate the digital transformation of all sectors of the economy.

The level of ICT regulatory development and readiness is heterogeneous in the HoA sub-region, ranging from the absence of a national regulatory authority in Eritrea to an advanced modern authority in Kenya, created in the 1990s, with policies driven by economic and social policy goals. In contrast the national authorities created in 2018 in Somalia and 2019 in Ethiopia are still in the early process of implementing policies. The government of Djibouti is establishing a multi-sectorial regulator, covering Telecom and Energy, that should be operational by the end of 2021. The following table provides a summary of the development of ICT legal and regulatory frameworks in each country.

Table 1: Status and level of development of legal and regulatory frameworks in the HOA

	Regulatory Authority (max 20)	Regulatory Mandate (max 22)	Regulatory Regime (max 30)	Competition Framework (max 28)	Overall Score (max 100)	Level of Regulatory Environment	Regulatory Group[4]
Djibouti	0	2.5	2	0	4.5	Regulated Monopolies	G1
Eritrea	8	11	4	2	25	Regulated Monopolies	G1
Ethiopia	7	12	8	2	29	Regulated Monopolies	G1
Kenya	18	21.5	21	27	87.5	Collaborative Regulation	G5
Somalia	14	19	10	24	67	Basic to enabling environment	G2/G3

Source: ITU ICT Regulatory Tracker 2018.

[4] The ICT Tracker is based on self-reported information gathered yearly by ITU. It facilitates benchmarking and the identification of trends in ICT legal and regulatory frameworks G1: Regulated public monopolies– command and control approach G2: Basic reform – partial liberalization and privatization across the layers G3: Enabling investment, innovation and access – dual focus on stimulating competition in service and content delivery, and consumer protection G4: Integrated regulation – led by economic and social policy goals. The assessment for Djibouti does not take account of the latest developments in creating a mult-sector regulator, supported by technical assistance from the World Bank.

There is an opportunity to upgrade national authorities based on best regulatory practices, potentially learning from Kenya which benefits from the most advanced regulatory framework and liberalized market in the region, with the objective to establish a harmonized regulatory framework amongst HoA countries. This would facilitate private sector cooperation and partnership, including for cross national telecom and ICT projects. The 2019 reopening of the border between Eritrea and Ethiopia, and improved diplomatic relations between Somalia and Kenya are improving the opportunities for cross-border investment. The main risk to a regulatory reform agenda is an opposition from the incumbent operators (state owned in Djibouti, Eritrea, Ethiopia and in a dominant position in Somalia) who typically adopt delaying tactics because competition can be seen as a threat to their monopoly position.

3.1.2 National Digital Infrastructure

As a direct consequence of the heterogeneous regulatory environment in the HoA sub-region, the development of national markets is poorly competitive, with issues on availability, affordability and quality of national fixed and mobile broadband services, with the exception of Kenya leading the way, and Somalia to some extent, and unequal access to international connectivity.

Table 2: Key Telecom Indicators for the HoA

	Fixed Broadband Penetration %	Mobile Penetration %	Number of Mobile Licensed Operators	Number of Fixed Licensed Operators	Mobile concentration index HHI* (GSMA)
Djibouti	16.3	37.6	1	1	10,000
Eritrea	0	10.6	1	4	10,000
Ethiopia	1.3	46.9	1	1	10,000
Kenya	3.8	107.9	4 +	8	5,135
Somalia	0.6	50.8	8	8	1,886
Africa Average	8.3	84.7	n/a	n/a	4,600

Notes: *The Herfindahl-Hirschman Index (HHI) is a measure of market concentration. A market with an HHI of less than 1,500 is considered to be a competitive marketplace, an HHI of 1,500 to 2,500 to be a moderately concentrated marketplace, and an HHI of 2,500 or greater to be a highly concentrated marketplace..

+ Kenya has also licensed three Mobile Virtual Network Operators (MVNOs) which can resell spectrum to offer more specialized financial services, for instance for the retail and financial services sectors.

Source: TeleGeography Globalcomms Database. GSMA.

Djibouti Telecom (DT) is wholly state owned, via a national sovereign wealth fund, and is the monopoly provider of mobile and fixed services in the country. DT's services include 2G, 3G and 4G (in the capital) technologies and fixed line voice, internet and data services (including corporate data, ADSL and Fibre), DT offers xDSL access primarily in Djibouti City, Ali Sabieh, Dikhil, Tadjourah and Balbala. Some nine submarine cables land in Djibouti forming a natural transit route for communications in the region between Europe and Asia. DT's objective is to consolidate its regional digital hub position via extending terrestrial connections with neighboring countries.

Eritrea Telecommunications Services

Corporation (EriTel) is majority-owned by the government and is the monopoly provider of mobile services limited to voice (3G still to be launched). Four ISPs were licensed in 2000: Eritrea Telecommunication Services Corporation (Eritel), Tfanus Enterprises, Computer Technology Service (CTS) and Ewan Technical Solutions (EWAN Net) – all with an initial international IP connectivity of 128kbps due to the absence in the country of undersea cable system. Eritrea is one of the only coastal countries in Africa that still lacks an undersea fiber connection to the internet. Discussion are ongoing to extend Liquid Telecom's 75,000km pan-African fibre-optic backbone network to the country.

State-run **Ethio Telecom** (formerly Ethiopia Telecom Corporation, ETC) was until recently the sole provider of mobile services in Ethiopia; however the Government has announced plans to award two new full service telecom licenses to open the market to competition. The first license was awarded, on May 22 2021, to the Global Partnership for Ethiopia consortium, which includes Vodafone, Vodacom, Safaricom, Sumitomo and CDC. A second planned license will be reauctioned. The government is working on a partial privatization of Ethio Telecom in parallel to opening the market. For the fixed market, Ethio Telecom faces some limited competition from the railway and electricity distribution companies, but this is limited to the trunk network, and both are state-owned.

In **Kenya,** there are currently three main operators: Safaricom, Airtel Kenya and Telkom Kenya, and several minor ones, Mobile Virtual Network Operators (MVNOs) and niche market players. A planned merger between Airtel and Telkom Kenya was called off in August 2020. The Communications Authority of Kenya (CA) is the sector regulator.

In comparison to the country's booming mobile data market, the Kenyan fixed broadband sector is still at a very early stage of development; following the shut down of the xDSL network of Telekom Kenya in 2015 several ISPs launched fiber to the home and DSL services, notably Zuku and Safaricom.

Despite being one of the poorest countries in the world, affected by recurrent security issues, the absence of regulatory barriers to entry in Somalia enabled mobile operators to freely operate, with regulation still catching up. **Somalia** was one of the last countries to be connected to the internet in 2000 and fixed broadband internet uptake is extremely low, partly because of the country's security situation (Al Shabaab has targeted users of mobile data and mobile money), as well as a lack of stable energy sources and the virtual absence of fixed line networks. The Hormuud Telesom Golis (HTG) group, which comprises three sister companies in different zones of the country, has come to dominate the market, mainly due to its dominance in mobile money services, where it refuses to interconnect with its main rivals, the Dahabshiil Group, including Somtel, and Amtel.

Table 3: Broadband Internet Quality of Service in HoA

Country	Fixed Broadband Download Speed Mbps	Fixed Broadband Latency ms	Mobile Broadband Download speed Mbps	Mobile Broadband Latency ms
Djibouti	n/a	n/a	9.65	41
Eritrea	n/a	n/a	n/a	n/a
Ethiopia	18.14	40	9.84	42
Kenya	21.33	39	14.98	34
Somalia	10.58	68	15.32	76

Source: Ookla Speedtest Global Index- June 2020; GSMAintelligence.com; accessed August 2020.

Box 1: Kenya National Optic Fiber Backbone (NOFBI) and linkages to HoA Neighbors

The NOFBI is a project aimed at ensuring connectivity in all the 47 counties of Kenya. The implementation of this project aims to ease communication across counties as well as improve government service delivery to the citizens such as application of national identity cards, passports and registration of birth and death certificates. The project is being implemented in 2 phases: NOFBI Phase 1 (4,300km) passes through 58 towns in 35 counties and NOFBI Phase 2 (2,100km), for which the Government of Kenya is requesting IDA financing under the Kenya Digital Economy Acceleration Program (P170941) will further be connecting all the 47 county headquarters. Operation of Maintenance of NOFBI is undertaken by Telekom Kenya on behalf of the Government, and there are plans to move towards a public private partnership (PPP) structure.

There are limited territorial fiber optic links between Kenya and Ethiopia and none with Somalia. High capacity submarine cables, such as Djibouti Africa Region Express (DARE) and Pakistan and East Africa Connecting Europe (PEACE), are within the vicinity of HoA and offer opportunities for comprehensive regional digital connectivity. The poor condition of the limited fiber optic cable network in Northeastern Kenya is a major hindrance to effective communication. The NOFBI is intended to connect to the undersea cable and deliver terrestrial broadband Internet to Ethiopia, Somalia, South Sudan, Uganda and Tanzania. As part of the HoA Gateway Development Project (P161305), leveraging on the creation and upgrade of transport corridors, the civil works related to laying territorial fiber optic cables will be integrated in the road works for protection and better management of utilities within the road reserve. There is a component to support the development and implementation of a MoU between Kenya, Ethiopia and Somalia on cross-border fiber optical cable traffic and negotiations on regional back-up capacity of submarine cables DARE and PEACE.

Source: Adapted from ICT Authority Kenya and World Bank HoA Gateway Development Project (P161305)

3.1.3 Regional Digital Infrastructure

The importance of the digital infrastructure, as an enabler for the development of a digital economy has been recognized by the 2016 World Development Report, with the 2021 update being prepared on this theme. However, the supply side for data infrastructure in the HoA region, with the exception of Kenya, is relatively poorly served. There are four main elements that compose a regional data infrastructure:

- Modern, efficient data centers, for the storage and recovery of critical data. Open access "Tier 4" data centers should be able to offer 99.995% uptime, and offer robust fault tolerance and full redundancy for every component.
- Internet Exchange Points (IXPs) that permit the peering of internet traffic between different operators, internet service providers (ISPs) and content service providers (CDNs);
- Data caches that store real-time copies of popular content (eg Facebook, Wikipedia, Google etc.). Having data stored locally reduces the need to constantly draw upon expensive

inter-continental links. It also reduces latency and improves user experience.

- Backbone networks based on high speed fiber links between data centers, IXPs and operators also form part of the broader regional data infrastructure.

Table 4: The market for data in the Horn of Africa

Country	Tier III Data Center or below	Tier IV Data Center	Internet Exchange Point	Competitive International Connectivity	Direct access to submarine cables
Djibouti	1	No	**Yes**	No	**Yes**
Eritrea	0	No	No	No	No
Ethiopia	2	No	No	No	No
Kenya	8	No	**Yes**	**Yes**	**Yes**
Somalia	2	No	**Yes**	**Yes**	**Yes**

Source: World Bank, adapted from TeleGeography and Packet Clearinghouse.

Cloud computing is now becoming the norm and the market has been dominated globally by companies like Amazon (AWS) and Microsoft (Azure), both of which have set up regional data centers in South Africa. The large social media companies, like Facebook and Google, or eCommerce companies like Alibaba, also tend to self-provide their data networks around regional hubs. They are also investing significantly in their own submarine cables. Alibaba has expressed interest in investing in Ethiopia through the Government ICT Park, located in Addis Ababa.

One implication of this trend towards decentralization of data is that a regional approach is more likely to be successful than a purely national one. The need for resilience also argues in favor of back-up data centers offshore. Counteracting that trend is the desire of some governments to impose data localization requirements (i.e. that national data, especially personal or confidential data, should be stored locally.

Within the region, Djibouti and Kenya's port city of Mombasa are perhaps best positioned to host regional data centers, IXPs and data caches, because of their privileged access to undersea fiber cables. In the case of Djibouti, however, the monopolistic nature of the market and high data prices might be deterrents. The region is in need of open access "Tier 4" data centers which could be developed near coastal landing stations.

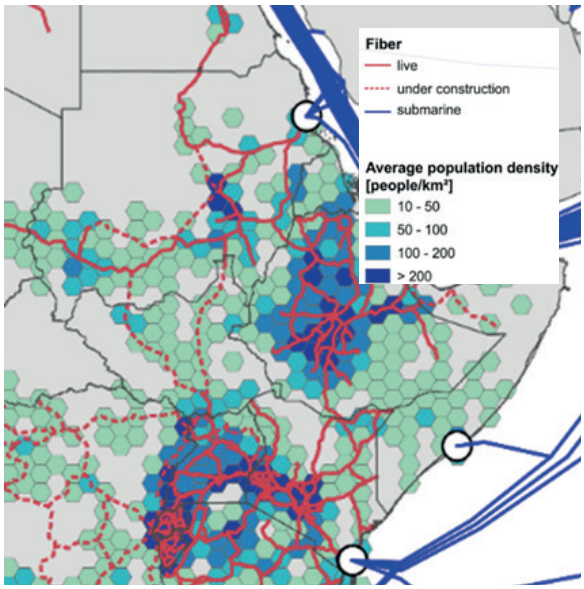
Currently, there are only three cities in the region served by submarine cables. While there are plans to connect several port cities in Somalia to the DARE and G2A cables, these are not yet operational.

- Djibouti is connected by nine submarine cables, and serves as the main gateway for international traffic to Ethiopia and northern Somalia via terrestrial cables to Addis Ababa and Hargeisa;
- Mogadishu (Somalia) is connected to one submarine cable, a branch from the EASSy (East Africa Submarine System cable), with a link to the DARE (Djibouti Africa Regional Express) due to open in 2021. However, while Mogadishu itself has a fiber metro ring, onward connectivity from Mogadishu to the rest of the country and into Kenya is limited to microwave connections;
- Mombasa (Kenya) is served by four submarine cables, and is connected to Kenya's relatively

dense domestic backbone. Mombasa also acts as a gateway for traffic to South Sudan and southern Somalia (albeit currently via microwave), and to Uganda, Malawi, Rwanda and elsewhere (via terrestrial fiber).

As shown in the Figure 2, there are large gaps between these three coastal landing stations, and many large cities are left unserved, notably Asmara (and the rest of Eritrea), Berbera (which would provide an alternative route to the sea for Ethiopia and Somaliland), Bossasso (which could serve Puntland) and Kismayo (which could serve Jubbaland and South West).

Figure 2: Digital Connectivity in the Horn of Africa



Source: World Bank, based on data from NSRC and TeleGeography Inc.

There are a number of projects that have been proposed by different players to meet this connectivity need (see https://www.submarinecablemap.com/):

- The DARE1 cable (Djibouti Africa Regional Express), that is proposed to serve the three existing stations plus Bossasso, with a possible DARE2 extension to other locations. Its principal proponent in the consortium is Djibouti Telecom.
- The PEACE cable (Pakistan East Africa Connecting Europe), this is proposed to serve the three existing stations, plus Bossasso and Kismayo, as well as other locations in Egypt, Europe (Marseilles) and Asia (Pakistan). Its primary promoters are the Chinese vendor, Huawei, and PCCW (formerly Hong Kong Telecom).
- The 2Africa Cable, whose consortium members include Facebook, Vodafone, MTN and China Mobile. This is a planned 37,000 km cable skirting the coast of Africa which is planned to enter service in 2023.

While these three projects have made some progress in raising funding, and have carried out feasibility studies, they nevertheless lack a source of financing that is neutral, in the sense of not belonging to a direct player or a beneficiary, such as IFC provided for the EASSy cable, one of the first cables to be laid off the coast of East Africa. They also lack a commitment to serve the region as a whole, including Berbera and Asmara. It is has also, to some extent, been sub-optimal to have the planning for the two cables underway concurrently, due, for example, to partners swapping between the two.

3.1.4 e-commerce and digital markets

Kenya is recognized as the Silicon Savannah and is the only country in the region that has been consistently highlighted as an innovation achiever, with technology leading entrepreneurs like M-PESA, Twiga Foods and Cellulant. Those entrepreneurial successes were possible due to a young population with a high risk-taking appetite, the proximity to regional markets and the existence of a support infrastructure to help the development including technology hubs, and substantial improvements in the digital infrastructure and facilities. The country is among the e-commerce and digital service leaders on the continent.

Table 5: Country scores on eCommerce and related legislation

Country	Cybercrime Law UNCTAD 2020	Data Protection Law UNCTAD 2020	Country value in the UNCTAD B2C E-commerce Index - UNCTAD	ountry rank in the UNCTAD B2C E-commerce Index – UNCTAD+	EGDI eGovernment development index value UN 2020	EGDI eGovernment development index rank UN 2018 ^	OSI Online Service Index UN 2020
Djibouti	Yes	No	27.7	125th	0.2728	179th	0.2235
Eritrea	No	No	n.a.	n.a	0.1292	192nd	0.0118
Ethiopia	Yes	No*	27.5	126th	0.2740	178th	0.3647
Kenya	Yes	Yes	49.0	88th	0.5326	116th	0.6765
Somalia	No	No	n.a.	n.a.	0.1293	191st	0.2941

Note*: In Ethiopia the constitution provides some principles for data protection. A new Proclamation on Data Protection is in draft form.
+ Ranking out of 152 economies in the UNCTAD B2C eCommerce Index, 2020.
^ Ranking out of 192 economies in the UN DESA eGovernment Survey 2020.

Kenya is still facing constraints including limited targeted support from government to entrepreneurship, rural and urban divide in the entrepreneurship ecosystem, limited access to capital and the low representation of women in the digital space. Addressing those constraints could further unlock economic growth. Proactive public investments and progressive policies and regulations have boosted access to broadband, resulting in better coverage, reduced prices and better quality of service. However due to low digital literacy in rural areas, limited relevant content and issues related to electricity and affordability barriers, a digital divide remains.

Inclusive and trusted systems are crucial tools for achieving sustainable development. Ensuring that everyone has access to identification is also the explicit objective of Sustainable Development Goal (SDG) Target 16.9—to "provide legal identity for all, including birth registration" by 2030. Furthermore, identification is also a key enabler or contributor to many other areas of development, such as financial and economic inclusion, social protection, healthcare and education for all, gender equality, child protection, agriculture, good governance, and safe and orderly migration.

Table 6: ID coverage gaps across the HoA

	Pop. share without national ID (age 15+)	Pop. share without birth registration (<age 5)	Pop. share without foundational ID* (age 0+)	People without foundational ID* (age 0+)
Djibouti	no data	8.3%	48%	464,000
Eritrea	no data	85.0%	59%	2,071,000
Ethiopia	41%	97.3%	66%	73,865,000
Kenya	9.1%	33.1%	19%	9,869,000
Somalia	no data	97.0%	76%	11,762,000
Source	2017 ID4D-Findex surveys	UNICEF/2019 ID4D Dataset	2019 ID4D Dataset	2019 ID4D Dataset

Note*: Foundational IDs are provided by governments as a means for citizens to prove who they are, for example through civil registries, identity cards, passports or birth certificates. They are built with the wider national population in mind, are generally universally available to citizens and can be used for multiple purposes.

3.1.5 Digital Financial Services

Financial inclusion helps to develop entrepreneurship which can take people out of poverty and potentially create new jobs, supporting the JET agenda. This can be achieved by promoting mobile money transactions, establishing full interoperability, establishing interconnection between mobile money networks (domestic and regional) with a glidepath toward zero added fees for cross-platform, cross-border transactions, and lowering the tax burden.In Kenya Digital Financial Services are successful due to a permissive regulatory environment that encourages experimentation. The country has been at the forefront of embracing Fintech with multiple partnerships between Banks and mobile network operators, allowing third party providers to connect through open APIs. Some obstacles remain, such as an unequal treatment between banks and non-bank actors. Furthermore, in the absence of full interoperability between systems, Safaricom enjoys a dominant position for its M-PESA service.

In terms of digital financial services, mobile subscribers in Kenya and Somalia are already large users. By contrast, Ethiopia has some of the lowest levels of mobile money usage on the continent, at less than 1 per cent of the population, and the service is virtually unavailable in Eritrea. In Djibouti, Telecom Djibouti just launched its Mobile Money services and it is too early to draw conclusions. Mobile money has the potential to offer a pathway out of poverty for hundreds of millions of people, and to spur broad economic growth.[5] Mobile money was primarily designed for and succeeded in developing countries where mobile money systems often reach far beyond traditional banking systems to provide payment services to rural and low-income people across vast distances.

Although M-PESA itself does not guarantee financial inclusion, it does provide a glimpse of a commercially sound, affordable, and effective way to offer financial services to all. Cash is the main barrier to financial inclusion. As long as poor people are able to exchange value only in cash—or worse, physical goods—they will remain too costly for formal financial institutions to address in significant numbers. Few banks are willing to build the costly infrastructure necessary for collecting low-value cash deposits and redeeming savings back into small sums of cash in low-income or rural areas. But once poor people have access to cost-effective electronic means of payments such as M-PESA, they could, in principle, become profitable to financial institutions.

Source: Mobile Payments Go Viral- WB

Harmonizing and modernizing legal and regulatory frameworks for digital transactions including facilitating seamless, low cost, cross platform and cross-border digital payments could promote digital financial access for all. The possibility to perform digital payment within and between countries will have tremendous benefits for the HoA citizens, governments, and businesses,

5 Bill & Melinda Gates Foundation – Financial Services for the Poor.

increasing the region's competitiveness, growth, job creation and enabling it to excel in the economy of the future as more deeply integrated and dynamic digital investment, innovation, and growth hub.

The region has seen low penetration of credit cards and bank accounts, associated with traditional banking. Digital payment is an evolutionary path now offered by many mobile money providers across the region, and an opportunity for Ethiopia and Eritrea to enable a new wave of financial inclusion. Mobile money is also seen as having a positive impact in helping close the gender gap in both access to finance and supporting access to economic opportunities.

While mobile money is popular, few online services provide direct online mobile money payment capability. People in East Africa countries are used to face-to-face transactions, so building trust in digital payments and online services should be a central focus, including ensuring enough safeguards are in place to protect consumers. This can include the establishment of mutual recognition of national digital IDs and a regional platform for identification verification by governments and digital services providers to enable cross-border data exchange; and the need to meet requirements for multiple aspects of user identification essential for cross-border digital transactions.

There is a need for harmonized laws and regulations that affect the availability and ability to use 'traditional' electronic payment platforms and implement harmonized national e-transactions laws, including recognition of electronic signatures and harmonized consumer protection rules, in accordance with the EAC Electronic Transactions Act . Network interoperability between mobile money networks (domestically and regionally): Mobile payment systems in HoA are mainly domestic and limited to a single operator's network. The systems typically have limited interoperability with other domestic operators, let alone other regional and international operators One exception is Kenya's Safaricom which has enabled international money transfers to Vodacom Tanzania, MTN Uganda and MTN Rwanda subscribers. Issues include unequal regulatory constraints between banking and non-banking sectors, strict requirements from Central Banks (noting that, in the case of Kenya, the CB support was instrumental to the success of Safaricom), lack of agent interoperability to enable competition and weak SIM card registration procedures, to give but a few examples.

3.1.6 Cybersecurity

Digitization, or promotion of digital services in a digital economy, requires mass production of data and massive data transactions. Critical infrastructure and new services are becoming heavily data-driven. Since data-driven services involve sensitive data, they are vulnerable to data breach attempts. Data storage and processing require extra attention to good safety and security practices. Privacy concerns can deter the public from making online financial transactions and purchases in the region. Therefore, cyber risk management is key to developing and maintaining consumer confidence in data-driven services.

Having a comprehensive approach to data protection and cybersecurity would increase usage of the digital services. The rapidly growing threat of cybercrime in Africa further increases the importance of appropriate cybersecurity measures in the HoA. While there are no tools in place to monitor the exact trends of cybercrimes and data breaches, the African Union Commission (AUC) is conducting a survey with the security company Symantec recognizing the global rise of cybercrime.[6] Being amongst the latest in internet

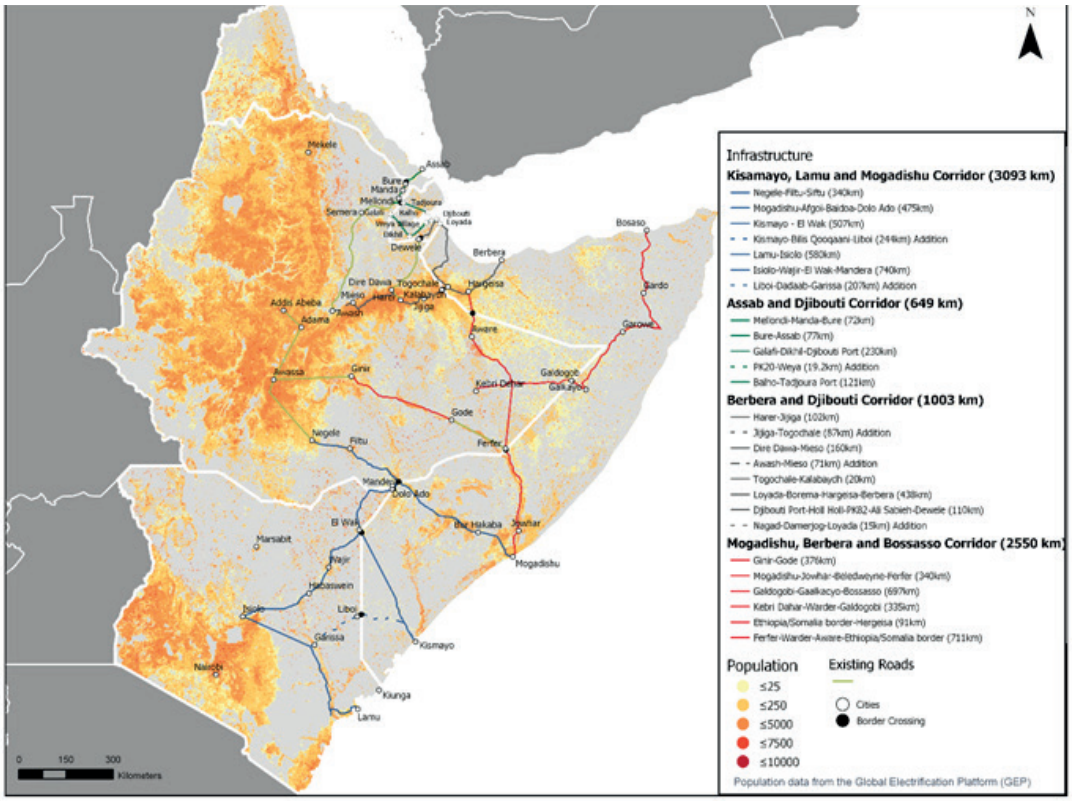
[6] https://www.thehaguesecuritydelta.com/media/com_hsd/report/135/document/Cyber-security-trends-report-Africa-en.pdf

development, HoA countries are highly vulnerable to the incidents, with Ethiopia and Somalia being the countries with highest risk of malware and virus infection due to low level of digital skills, and cybersecurity awareness, among the population.

The longer-term aim is the successful creation of a more regionally integrated **digital single market** in the sub-region, with relatively frictionless cross-border data flows, within a well-regulationed environment, This would require collaboration between countries to agree a common approach to data protection, data privacy and cybersecurity and it is in all countries' interests to support a coordinated regional framework. As more and more digital services evolve, the threat will also intensify. These threats have detrimental effects on regional e-commerce and e-health services, or critical infrastructures such as power grids, financial and customs systems, as well as digital ID schemes that rely on data and digital services. Harmonized data protection and privacy procedures would avoid a "race to the bottom," in terms of standards, in a bid to attract data-driven services investment at the expense of consumer protection.

Legislation to secure the security of data and privacy is almost non-existent except in Kenya, which developed the *National Cybersecurity Strategy (2014)* and enacted the *Computer and Cybercrimes Act (2018),* and in 2019 adopted a new data protection Act. The country also has a multi-stakeholder local collaboration between the government, the different CIRTs, and other key stakeholders, including financial institutions, telecommunication operators, critical information infrastructure providers, etc. None of the five countries have signed or ratified the African Union (AU) Convention on Cybersecurity and Personal Data Protection. There is thus scope to improve national policy in this area and develop a coordinated regional approach that is grounded in best practice and adopts common standards.

Figure 3: Horn of Africa - Proposed Infrastructure



Source:

Table 7: List of routes proposed

Route proposed	Length	Feasibility Study	Estimated budget
Djibouti to Ethiopia		Yes	$13m
Samara - Galafi - Dikhil – Djibouti		Yes	$13m
Dire Dawa - Dewelleh – Ali Sabeh – Djibouti			
Djibouti to Somalia			
Djibouti - Loyada – Borama		No	$5m
Kismayo – El wak		No	
Kismayo – Liboi		No	
NETIP: Isiolo – (1) Wajia - Madera – Dadaab (2) Mogadishu – Elwa	744 km	No	$34m
LAPSSET: Lamu - Isiolo – Moyale	1,000km	No	$60m
Bure-Assab		No	
Zal ambassa-Asmara-Masawwa		No	
Mogadishu – Firfir		No	
Mogadishu – Dollo		No	
Bossaso – Goldogob		No	
Berbera-Togo Wojjale		No	

Source:

While new links proposed are likely to be able to attract private sector investment, commercial interest may vary. It is thus proposed that routes (detailed in Table 1) be financed predominately through public private partnerships (PPPs) with neutral financing from development partners complementing private sector financing from operators serving the region. The donor community could add value by serving as an anchor tenant for financing, and by supporting feasibility studies as well as providing needed technical assistance related to PPPs and other enabling regulation required for investments and implementation to be viable.

Project Alignment with Key Objectives:

- Bringing more users online, across the Horn, will be the first step to creating a larger, integrated digital market in the region – able to attract greater investment, offer local firms the opportunity to scale on the back of a growing regional digital consumer-base and provide users wider a growing array of digital and data-driven services.
- Robust middle-mile infrastructure, composed of terrestrial backbone networks, are needed to distribute high-capacity bandwidth across each country, but also to channel international connectivity received through regional and global networks (i.e. first mile infrastructure), including the proposed regional sub-marine festoon cable.
- Related links are also essential to the roll-out of last-mile access networks that allow consumers to get connected. While access to high-speed broadband is growing, millions of people across the Horn currently remain unconnected.
- New terrestrial links will thus help expand backbone networks in underserved areas.
- Moreover, connecting backbone networks will help boost competition and resilience. Linking networks will help introduce

redundancy that limits the risk of outages (like the one experienced in Somalia in 2018, which resulted in substantial economic losses). Linking national backbone networks can also help introduce more competition in the wholesale market, with spill-over on price in the retail market, yielding lower cost connectivity services for end-users.

Currently, national digital infrastructure markets diverge widely in their level of development, competition, and wider market maturity, with disparities in access, pricing, and capacity. Substantial connectivity divides therefore persist both between and within countries, with widespread inequality in access. Market maturity (in terms of competition, enabling regulation etc.) is likely to determine both the level of complementary support required and the readiness of operators to invest.

- **Regulatory work will need to be undertaken in tandem,** both in terms of filling gaps at a national level but also related to regional harmonization. Licenses to build infrastructure are typically awarded on a national basis, which means that roll-out of cross-border links will require cross-border collaboration. This intervention should thus ideally be pared with regional cooperation and harmonization on licensing. In the past, regulatory gaps have also deterred investors e.g. related to investor protection, PPPs and right of way.
- **There is ample scope to crowd in the private sector.** Expansion of networks tends to be private sector led, though some government support may be necessary for coverage of areas where deployment would otherwise be unprofitable. At this stage, it is not clear which routes are commercially viable and which are not.
- **Pre-feasibility studies of most of the corridors detailed above are needed** to establish the length, cost, status of existing infrastructure, current and future demand, level of commercial interest etc.
- **Laying fiber along new transport / energy corridors should be a priority,** in line with "dig once" policies.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