Assessing the Socioeconomic Impact of the Internet Shutdown in the English-Speaking Regions of Cameroon from a Multistakeholder and Mulitsector Perspective

Internews

This report was funded by Internews

"Our country needs generalized Internet access …
to be better placed to enter the third millennium."

H. E. Paul BIYA, President of the Republic of Cameroon

By Ngang Eric Ndeh Mboumien, AfroLeadership (2018)
The findings, interpretations, and conclusions expressed herein are those of the author

About AfroLeadership

AfroLeadership is a Civil Society Organization (CSO) registered in Cameroon in 2010, that strongly promotes for human rights, digital rights, digital identity, data rights, data privacy, data protection, data ethics, civic technologies and citizen participation in Africa. It uses advocacy, research, knowledge sharing and capacity building to create awareness on human rights with various stakeholders (policy makers, public administrations, local governments, private businesses, civil society organizations, medias-journalists, community based organizations, etc.).

AfroLeadership works with partners like Internews and others to develop its competencies and expertise in promoting human rights offline and online. It is the technical secretariat of the Digital Rights Coalition, that empowers citizens, civil society organizations and medias on issues relating to create a vibrant community at grassroots level around Internet rights as supported by various international human rights instruments like the African Declaration of Rights and Freedoms of the Internet. As the host of MyData Cameroon Hub, AfroLeadership is a founding member of MyData global, a movement which mission is to empower individuals by improving their right to self-determination regarding their personal data, as a prerequisite for a fair, sustainable, and prosperous digital society, where the sharing of personal data is based on trust. AfroLeadership is also involved in building the Civic Charter Community in Africa, a framework to defend freedom of expression, freedom of information, freedom of assembly and freedom of association.

AfroLeadership, as a member of Transparency, Accountability, and Participation Network (TAP-Network), is actively involved in Cameroon's civil society Sustainable Development Goals (SDGs) Working Group and especially SDG 16 for peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels." In this light, it is committed to open data and has been selected as a steering committee member of the francophone open data network (CAFDO). AfroLeadership was selected in Mexico 2015 Open Government Partnership Mexico as one of the five winners of the Open Government Partnership (OGP) Fiscal Openness Working Group (FOWG) award, for its work on fiscal transparency and open data for service delivery to citizens, in local governments specifically. AfroLeadership is devoted to developing an Open data community as the host of Code for Cameroon, that aims at building capacity for data journalists and data wranglers for accountability and civic participation.

Table of contents

List of Tables

List of Figures

List of Acronyms

AICD
Africa Infrastructure Country Diagnostic

AIMF
Association Internationale Des Maires Francophones

ANTIC
Agence Nationale des Technologies de l'Information et de la Communication ("National Information and Communication Technology Agency")

ADSL
Asymmetric Digital Subscriber Line

ACE
Africa Coast to Europe

COLEPS
Cameroon Online E-Procurement System

CRTV
Cameroon Radio and Television

CAMTEL
Cameroon Telecommunications

CSO
Civil Society Organization

GDP
Gross Domestic Product

CENADI
National Center for Development of Computer Science

CIPESA
Collaboration on International ICT Policy in East and Southern Africa

EDI
Electronic Data Interchange

ENSPT
National Advanced School of Post and Telecommunications

ENSP
Ecole Nationale Supérieure Polytechnique ("National Advanced School of Engineering")

FOWG
Fiscal Openness Working Group

GESP
Growth and Employment Strategy Paper

INDAFTEL
Industrialization of African Telecommunications

ISP
Internet Service Provider

IXP
Internet Exchange Point

INTELCAM
International Telecommunications of Cameroon

MCTs
Multipurpose Community Telecentres

MDGs
Millennium Development Goals

MINCOM
Ministry of Communication

MINEFI
Ministry of Finance

MINFOP
Ministry of Vocational Training

MINJUSTICE
Ministry of Justice

MINRESI
Ministry of Scientific Research and Innovation

MINCOMMERCE
Ministry of Commerce

NGO
Non-Governmental Organization

MINPOSTEL
Ministère des Postes et Télécommunications du Cameroun
(“Ministry of Posts and Telecommunications of Cameroon”)

MVNO
Mobile Virtual Network Operator

NICI Plan
National Information and Communication Infrastructure Plan

NRI
Networked Readiness Index

OGP
Open Government Partnership

PMO
Prime Minister's Office

PRC
Presidency of the Republic of Cameroon

QoS
Quality of Services

SIGI-PES
Integrated Computer Management System for State Personnel and Salaries

SMS
Short Message System

SDGs
Sustainable Development Goals

STM
Synchronous Transport Module

TRA
Telecommunications Regulatory Agency

TRB
Telecommunications Regulatory Board

TICAD II
Tokyo International Conference for African Development II

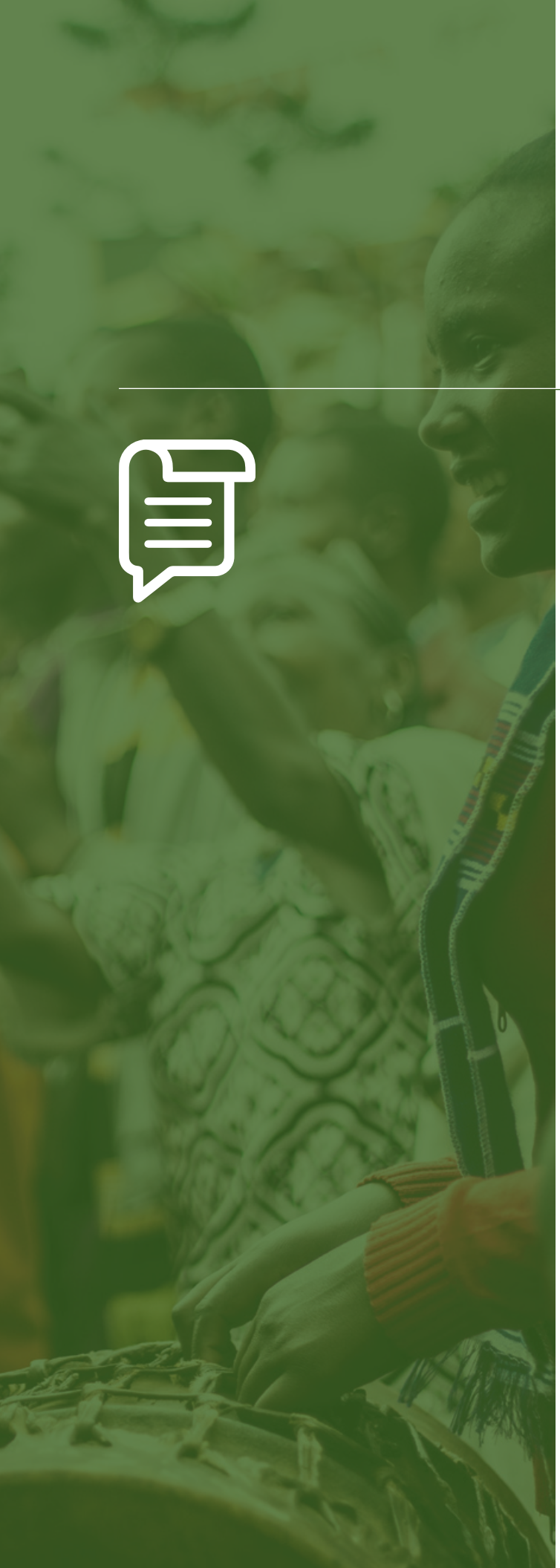
UNIDO
United Nations Industrial Development Organization

UNDP
United Nations Development Program

USD
United States Dollar

VSAT
Very Small Aperture Terminal

WACS
West Africa Cable System



I. Introduction

Cameroon is a country in Central Africa with an area of 475,442 km². As of 31 December 2017, Cameroon's total population was 24,229,247, with 12,114,634 (50.1%) being female and 12,114,613 (49.9%) being male (Countrymeters, 2018). The country has a population density of 52.2 people per square kilometer (135.3/mi2), with 45% of its population being under 15 years of age and 64% being aged below 25 years; the average age of the population is 22 years (NAICT, 2007). Statistics show that as a result of the mass exodus from rural areas, about half of Cameroon's population lives in towns, with Yaoundé and Douala being the most populous cities.

From the early 1970s to 1981, Cameroon's economy witnessed a steady growth with the real gross domestic product (GDP) averaging 4% annually. However, from the mid-1980s and following the slump in global oil prices, the country experienced serious economic crises; it was hit by economic meltdown followed by a recession and devaluation of the Communauté Financière d'Afrique ("Financial Community of Africa") (CFA franc) the country's currency backed by the French treasury to normalize the situation (NAICT, 2017). Generally, human development indices worsened significantly during these years, especially those that concerned the education and health sectors. The satisfactory economic performance of recent

years has proven to be inadequate to remedy the situation, despite a declining poverty rate. That is why, in 2002, the Human Development Index (HDI) was about 0.512, with Cameroon being ranked 135th among 173 countries. The World Bank's Doing Business Index, which ranks economies based on their ease of doing business, ranks Cameroon 164th (out of 181), with the existing governance issues being important deterrents to increased investments in the country. Corruption is ingrained in all levels of society, with 79% of Cameroonians admitting to paying bribes. The country ranks below the 25th percentile on all criteria of Kaufmann-Kraay Governance indicators, significantly lagging behind its peers; it ranks 141st (out of 180 countries) in Transparency International's 2008 Corruption Perception Index. Enforcing a contract takes 43 steps and 800 days. Improving governance is a priority of the government's revised development policy orientation.

According to the National Agency for Information and Communication Technologies (NAICT), the incorporation of ICT in information society can provide a powerful channel for boosting a country's development; it opens up new opportunities for bringing together individuals, communities, the private sector, and the nation at large to create, assess, utilize, and share information and knowledge to obtain sustainable social and economic growth.

There is a distinct difference between the developing countries with the growing influence of the Internet or digital economy and the developed countries capable of using the power of information flow to adapt to changing social and economic environments quickly and discover opportunities to overcome social and economic challenges, such as poverty and lack of adequate infrastructure as daily challenges faced by the developing countries. For countries in sub-Saharan Africa like Cameroon, ICT is a powerful tool to help increase productivity and competitiveness, stimulate growth, create employment opportunities, and improve its citizens' well-being.

The Networked Readiness Index (NRI), designed to assess the state of network readiness of some selected economies and initiated as part of the Global Information Technology Report, shows that although Cameroon is ranked one of the worst-performing countries based on the seven pillars of a digital economy indicates (Dutta et al., 2016), it is showing some marked improvements compared to its peers in this group of countries (131st place in 2014, 126th in 2015, and 124th in 2016). Despite this positive outlook, Cameroon still has to bridge significant gaps to become an Internet economy, which is a major step toward addressing some of these governance and socioeconomic challenges. Besides, Cameroon's 2011 country report, contained in World Bank's Africa Infrastructure Country Diagnostic (AICD), shows that improvements in ICT boosted Cameroon's growth performance between 2000 and 2005 by 1.26% per capita, illustrating an expected annual growth, although this was stalled by deficiencies in other sectors, such as power infrastructure, which held growth back by 0.28%. Thus, there is a direct relationship between improved infrastructure and growth in the economies of countries that embark on diverse reforms and actions to improve their infrastructure. Also, a

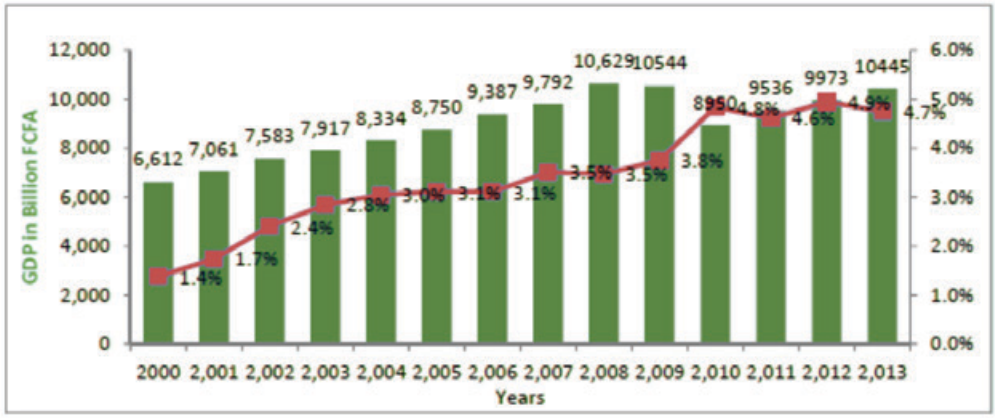
correlation has been established between the transparent and efficient economies of countries and their usage of ICT to conduct these economic activities (The Economist Intelligence Unit, 2010).

Many authors and institutions have highlighted the important role and impact of modern technologies in boosting growth trajectories of many African economies. This includes better access to improved infrastructure services, such as ICT, as an important engine for economic growth. Like its counterparts, Cameroon is no exception to the poor state of infrastructure, which is a key barrier to growth in African countries (Atsa et al., 2016, Mwangi and Nelipher, 2011, AEO, 2009). Given that most of the sub-Saharan African countries are dependent on agriculture and natural resources, which are key drivers of their economies, boosting and advancing innovations and scaling up the usage of ICT and modern technologies are known to boost service sectors, such as banking, finance, governance, education, health, and insurance. The authors and institutions working in the sector further indicate that integrating ICT into people's day-to-day activities on the continent enables people to successfully engage themselves in business through markets that depend on the Internet and social computing platforms. In brief, the digital economy can significantly contribute to the country's economy, as shown in Figure 1 below.

Accordingly, Cameroon's long-term development vision—known as Vision 2035—with the elaborated Growth and Employment Strategy Paper (GESP) highlight the important role of the Internet or digital economy in helping Cameroon become an emerging economy and a regional economic hub by 2035. As an essential prerequisite to meeting this vision, the Government of Cameroon has proposed the availability and dissemination of learning and knowledge, which make telecommunications and ICT possible. According to the national strategy, this is underpinned by three key dimensions:

Figure 1:

Contribution of the digital economy to Cameroon's national economy (2000–2013)



(Source: Atsa, 2016)

1.Adapting and updating the legal, statutory, and institutional framework.

2.Improving the quantity and quality of services (QoS) provided and making them affordable.

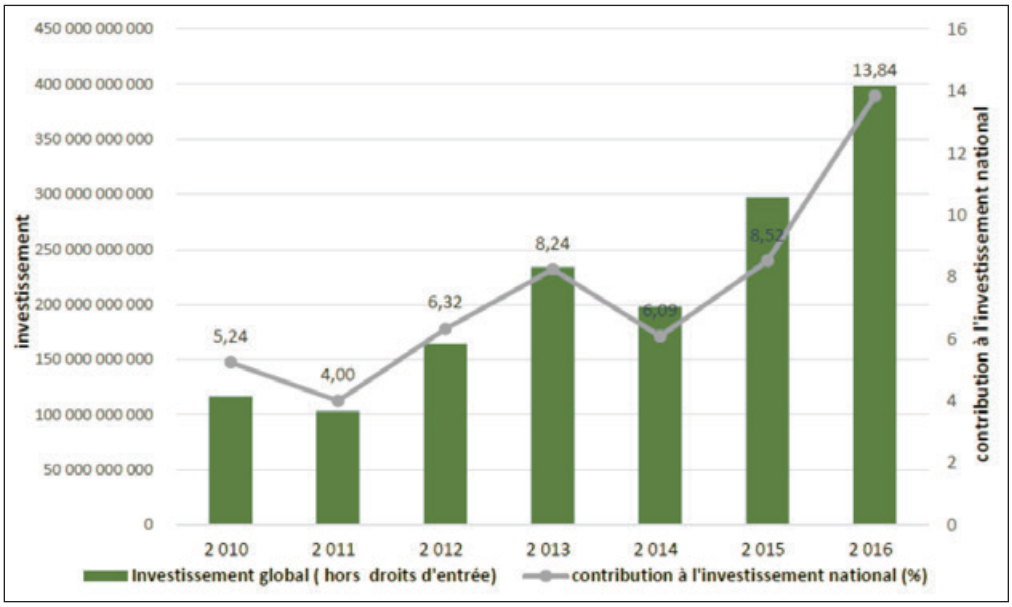
3.Increasing the use of ICT and the industrial fabric of ICT companies (Republic of Cameroon, 2009, p. 63).

Based on the above orientations, in his inauguration speech on 3 November 2004, Cameroon's head of state said to the nation that "our country needs a generalized access to the Internet" (The Sector Strategy for Telecommunications and ICT, 2005–2015; Nana and Tankeu, 2012).

Significant investments are currently being made to create an environment conducive to the realization of this perceived need, ranging from wide infrastructure development, development of the energy sector, and policy development to enhancing services in the sector, ensuring that citizens can access and generate knowledge to transform the country's economy. According to the Annual Observatory of Cameroon Telecommunications Regulatory Board (TRB), investments in 2016 stood at 398,63 billion CFA francs recoding a 34.04% increase from the 2015 figures, given the increase in the government's investment in the sector since 2010 as a measure to improve network coverage across the country to boost the QoS of electronic communications for users, as shown in Figure 2.

Figure 2:

Government's investments in the telecommunications and ICT sectors



(Source: TRB, 2016)

According to the National Agency for ICT (NAICT) 2016 National Policy for the development of ICT, the government has recently announced and launched several projects and initiatives to stimulate the use of ICT, as a major step toward the Internet economy. Some of these initiatives are as follows:

- The offer of 500,000 laptops to students with a view to modernizing the higher education sector; the first 80,000 pieces were delivered in December 2017 (Business in Cameroon, 2017; PRC, 2016).

- The digitalization of the public procurement system by implementing the Cameroon Online E-Procurement System (COLEPS) in partnership with South Korea to begin in 2018. COLEPS seeks to eradicate corruption in the public contracts sector, enhance transparency and trust, and grant all Cameroonians access to public contracts.

- The formulation of a sectoral strategy in the field of telecommunications and ICT by the Ministry of Posts and Telecommunications of Cameroon ("Ministère des Postes et Télécommunications du Cameroun") (MINPOSTEL) in 2005.

Alongside these activities, several initiatives for the development and deployment of ICT are underway within government departments in Cameroon. These include:

- The formulation of a government action plan for an information- and knowledge-based society by the Ministry of Scientific Research and Innovation ("Ministère de la Recherche Scientifique et de l'Innovation") (MINRESI).

- The implementation of an ICT development program by the Ministry of Higher Education.

- The creation of multimedia resource centers in secondary and high schools within the Ministry of Secondary Education.

- The implementation of the audiovisual sector liberalization option by the Ministry of Communication ("Ministère de la Communication") (MINCOM).

- The computerization of the national identity card by the Delegation of National Security.

- The computerization of the electoral process by the Ministry of Territorial Administration and Decentralization.

These national initiatives are supported by other external initiatives, such as:

- The initiative of the Economic Commission for Africa (ECA) on defining the National Information and Communication Infrastructure Plan (NICI Plan).

- The United Nations Development Program (UNDP) initiative on the ICT policy in Cameroon within the framework of the Second Tokyo International Conference for African Development (TICAD II).

When completed, all these projects are expected to introduce the country as a hub of telecommunications and e-business in the sub-region. They will lead to the development of other forms of ICT-based transactions, such as electronic payment and e-commerce. A new type of entrepreneurs has emerged, such as the airtime vendors, who make up a population of almost 100,000 people, which is about half the size of human capital for public service. New training niches have also emerged in universities with the creation of new specialized majors to provide Cameroon with highly qualified human resources in the field of ICT (Atsa et al., 2016).

Despite these initiatives to enhance the availability of and access to the Internet, the country has not been very successful in addressing the need for generalized Internet access with concrete action. Many African countries tend to restrict access to the Internet of a segment of their population, and Cameroon has been one of them, as shown in Table 1.

Table 1:

Growing number of Internet shutdowns across the African continent

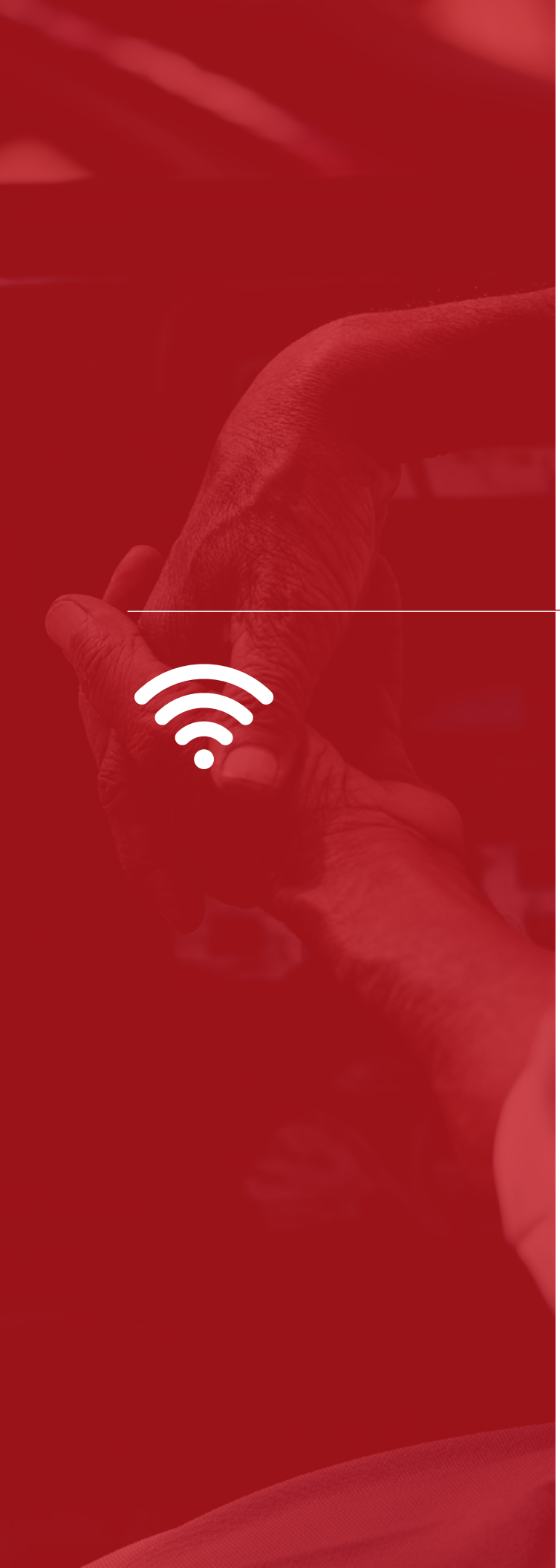
Source: CIPESA, 2016

Country	Nature of disruption	Dates	No.of days
Burundi [4]	Social media	April 29-May 13, 2015	14
Cameroon [5]	Regional shutdown	January 17-April 20, 2017	93
Chad [6]	Total shutdown Total shutdown	April 10-13, 2016 February 15-16, 2016?	3 2
DR Congo [7]	Total shutdown Social media Social media	January 2015 [8] December 18-28, 2017 August 7-11, 2017 [9]	20 11 4
Ethiopia [10]	Total shutdown Social media	Various October 5-17, 2016 June 1-8, 2017	24 12 7
Gabon [11]	Total shutdown [12] Social media Internet curfew from 6pm to 6 am [13]	August 31-September 5, 2016 September 5-18, 2016 September 5-18	5 14 12
Gambia [14]	Total shutdown	November 30-December 2, 2016	3
Mali	Social media Social media	August 17-20,2016 June 13-14,2017	3 2
Niger	Total shutdown	January 22-24, 2016	3
Republic of Congo [15]	Total shutdown Total shutdown	October 2015 March 20, 2016 [16]	3 2
Togo [17]	Total shutdown	September 5-11, 2017	5
Uganda [18]	Social media and mobile money Social media	February 18-21, 2016 May 11-12, 2016	4 1

Since February 2017, the Government of Cameroon has cut off access to the Internet of the English-speaking segment of the population. Many citizens considered this an outlet through which they could express their views, and therefore, this move was seen by international Internet players as an outright violation of the constitutional right to freedom of expression and access to information. Today, English-speaking Cameroonians are witnessing limited opportunities for inclusive and successful citizen participation in decision-making processes, and given the lengths of shutdowns, Cameroon can be recorded as one of the countries in sub-Saharan Africa with the longest period of Internet shutdown (CIPESA, 2016). The government action to restrict access to the Internet has had significant negative social, economic, and political impacts on the citizens, with many players and institutions, including Internet Sans Frontières, Access Now, World Wide Web Foundation, and the renowned international digital activist Edward Snowden calling for the reinstatement of the Internet as a basic right (e.g., through hashtags, such as #BringBackOurInternet and #KEEPITON) (ISF, 2018).

In the first part of this report a qualitative approach is used to examine the ICT and telecommunications landscape in Cameroon around the four pillars contained in Global Innovation Mediated Paradigm Shift (GIMPS) framework (Turban et al., 2007), including policy, technology and infrastructure, people (accessibility, usage, and penetration), and strategies. The antecedents of the digital technology in Cameroon focus on the Internet access structure in two periods (i.e., 1998–2008 and 2009–2018) during which significant milestones were recorded in Cameroon and drive the country to emerge as a fully digitalized nation by 2035. Key factors include the policies and laws that promote an environment conducive to a thriving ICT sector, the players and institutions and how they organize the Internet access, and the strategies to confront challenges as a result of repressive actions. Other key factors include research articles and publications from different authors and public, private, and international institutions, publications on official websites as well as newspapers, social media, and business posts with a bearing on the telecommunications sector in Cameroon. The concluding part of this assessment introduces the innovative “Mind Chats,” which is a collection of quotations and testimonies from different portals and those who responded to the questionnaire.

The second part of this assessment draws on 100 questionnaires with defined questions, which were administered in two English Speaking regions (North West and South West) of Cameroon, targeting diverse stakeholders, to evaluate the socioeconomic impacts of restricting access of some segments of Cameroon’s population to the Internet; this is particularly important because it paradoxically takes place against the backdrop of the digital economy being seen as a lever of sustained development. The Collaboration on International ICT Policy for East and Southern Africa (CIPESA) framework for estimating the economic impact of Internet disruptions (the Internet, social media, and app shutdowns) in sub-Saharan Africa is used to calculate in numerical terms the impacts on Cameroon’s economy of the Internet shutdown in two regions to complement the data collected from the respondents. The study concludes with recommendations to improve the Internet landscape in Cameroon in line with GIMPS framework’s policy, technology and infrastructure, people (accessibility, usage, and penetration), and strategies.



II.

Context and stakes in access to the Internet in Cameroon (1998–2017)

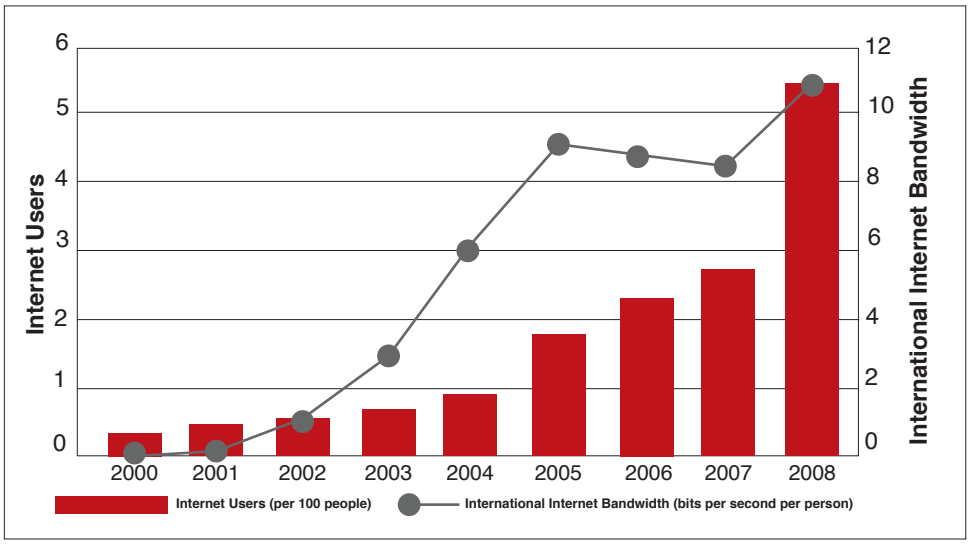
The telecommunications sector in Cameroon has witnessed significant progress in recent decades. From 1998 to 2008, a strategy was in place that allowed making use of the sector fundamentals; this strategy enabled cost recovery through commercial tariffs and a relatively short path to breaking even and reducing the high capital expenditures incurred by the government. The strategy led to the privatization of Cameroon Telecommunications (CAMTEL) in 1997, a process which was halted in 2002. Thus, CAMTEL has to date maintained the monopoly on the Internet gateway, and Internet service providers (ISPs) continue to rely on costly Very Small Aperture Terminal (VSAT) infrastructure while the full benefit of the submarine cable connection has not been yet attained.

During this period, the full benefit of the submarine cable connection has been mitigated by CAMTEL's monopoly on the gateway. Although prices are lower when there is access to the submarine cable, they are even lower when there is a competitive international gateway. As a result, ISPs continue to rely on costly VSAT infrastructure. The

launch of competitive wireless offerings by mobile operators forced the fixed broadband prices to decline from US$104 in 2009 to US$61 in 2010, boosting the number of the Internet users in the country, as shown in Figure 3.

Figure 3:

Evolution of the Internet users in Cameroon (2000–2008)



(Source: AICD database)

The period 2008–2017 witnessed the deployment of more technical and human resources for better coverage and higher network speed for clients. There has been some steady progress first with the 2G saga (Voice and Short Message System "SMS") and then the migration to 3G (September 2014), which ushered in the rise of high-speed mobile networks and innovative services with the very first value-added multimedia applications. More recently, the fourth generation (4G) was introduced in 2015, which gave new impetus to the mobile telephony landscape and paved the path for Cameroon's technological development and expansion of the digital economy (Bahri-Domon, 2017). Given all this dynamism, the 2016 Ericsson report on mobility showed that Cameroon's Internet penetration rate had been 25.6% by the end of December 2015 as opposed to the 2% stagnant rate recorded during the Asymmetric Digital Subscriber Line (ADSL) era, which increased to 7% with the introduction of mobile telephony. During this period and beyond, CAMTEL has engaged itself with diverse partners to enhance Internet access at an affordable rate. For example, on 22 February 2017, the data service provider Yoomee signed a commercial agreement with the national telecom operator CAMTEL, forming an official Mobile Virtual Network Operator (MVNO) in Cameroon; this partnership ensured the optimal utilization of the already deployed network and technical infrastructure of CAMTEL and Quality of Service (QoS), ensuring data is

offered at affordable prices to the entire Cameroonian market as per the agreement. This to be aided by an effective deployment of optical fibers network throughout the country (Figure 4).

Figure 4:

Optical fiber network of Cameroon

I In 2008, the idea of implementing an Internet Exchange Point (IXP) was first introduced, and by 2013, a multistakeholder board of directors made up of representatives of operators in the sector and consumers rights civil society organizations, including the Internet society, were tasked by MINPOSTEL with the design and implementation of necessary infrastructure. Although this idea is supported by the National Information and Communication Technology Agency (Agence Nationale des Technologies de l'Information et de la Communication) (ANTIC) in charge of ICT promotion in Cameroon and the World Bank, progress on the project has been slow.

The national operator CAMTEL is continuously seeking opportunities to offer broadband connection to its consumers. To this end, it is keen to take advantage of its connection to the SAT3 undersea fiber-optic cables to increase Internet connectivity and is actively working to deploy the optical fiber technology across the country, which is a critical infrastructure in the development of telecommunication services. Recently, West Africa Cable System (WACS), deployed by MTN Cameroon and Africa Coast to Europe (ACE)—a project implemented by the local subsidiary of the Orange Telecommunications group—was introduced as one project amongst many that aim to help Cameroon boost its urban and inter-urban optic fiber network, estimated at roughly 6,000 kilometers and forecast by the government to increase to 10,000 kilometers by 2020, thus making Cameroon a hub of telecommunication infrastructure in Central Africa (Business in Cameroon, 2017; Atsa et al., 2016; CC_PRC, 2016). This is in line with the government's repeated call on all stakeholders nationwide to embrace digital economy as the key to the development of the country in all spheres through the implementation of major projects (MINPOSTEL, 2017; Atsa et al., 2016). Accordingly, a total of 46 billion CFA francs of the state budget was allocated to MINPOSTEL, with 1.5 billion CFA francs of the budget reserved for the digitalization of its services for the 2018 financial year (Cameroon-Info.Net, 2018). Although this represents a meager allocation to the ICT sector, compared to the state budget of 4 thousand 513 billion 500 million CFA franc and other countries such as Senegal, Cote d'Ivoire, and Kenya, it is an indication of the government's interest in boosting the sector (Table 2).

Table 2:

Comparative analysis of investments in the ICT sector in Cameroon with that of three other African countries

Source: AICD

	Cameroon	Senegal	Cote d'ivoire	Kenya
%GDP	3.4%	6%	5.7%	4.2%
Investment (ICT) (Billion CFA)	700	1200	1000	2000
Investment (State) (Billion CFA)	195	250	300	1500
Direct Jobs	6000	5000	6000	20 000
Indirect Jobs	500,000	200,000	180,000	800,00

Since 2015, the Government of Cameroon has challenged the stakeholders nationwide to move toward the network economy, also known as the digital economy, to foster the development of the country. The efforts to offer broadband connections in Cameroon have been stalled by the fact that the national operator CAMTEL has remained the only fixed-line broadband operator, despite numerous attempts at privatization (Budde.com, 2013). Until 2012, this state institution was given exclusive rights to access the SAT-3 cable, and this exclusivity over the gateway had allowed the company to charge ISPs high prices with impunity. For example the monthly lease price for an STM1 ½ circuit departing from Cameroon can cost around US$1,600,000. In 2012, for example, the monthly lease price for an STM1 ½ circuit from Douala in Cameroon to Dakar in Senegal (3,200 km) was US$51/month/km (i.e., US$163,200/month).

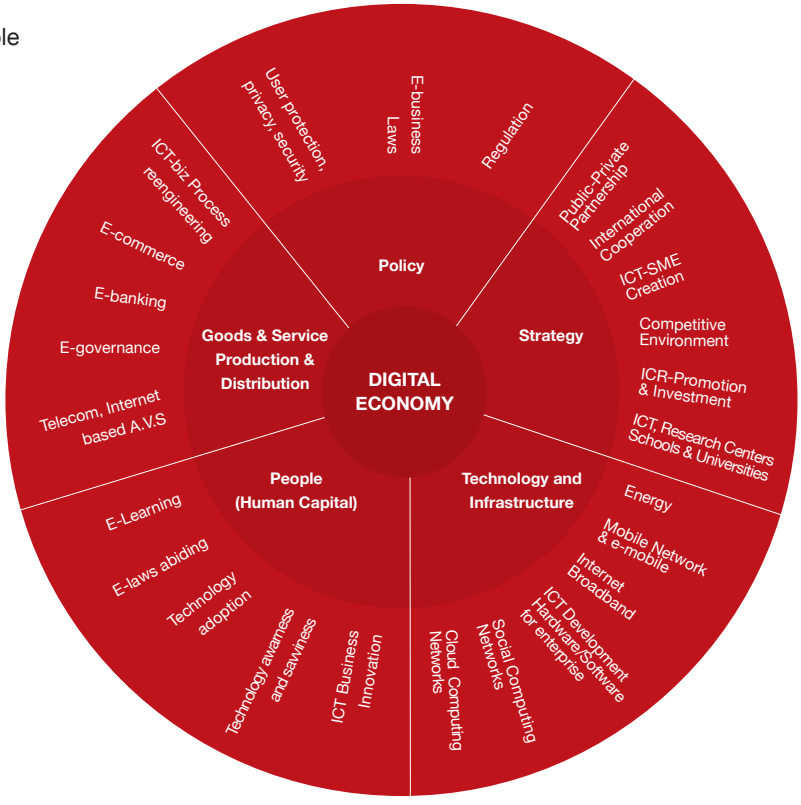
By comparison, in 2012, the monthly lease for an STM1 ½ circuit from London to Moscow, which has a comparable distance of around 2500 km, cost US$2.30/month/km (i.e., US$5,761/month). ISPs, in turn, have passed the bulk of these costs onto Cameroonian consumers.

Several authors have examined Cameroon's readiness to embrace and take advantage of this change. Remarkably, Atsa et al.'s (2016) study looks at what countries should do or be doing to evolve toward an Internet economy. In their study, they highlight seven things that need to be considered by countries like Cameroon, including research and innovation, entrepreneurship and startups, digital business transformation (e-commerce, ICT, workforce), digital infrastructures, and governance, as highlighted in Figure 5.

Figure 5:

Major components of digital economy developm

Source: Atsa et al. (2016)

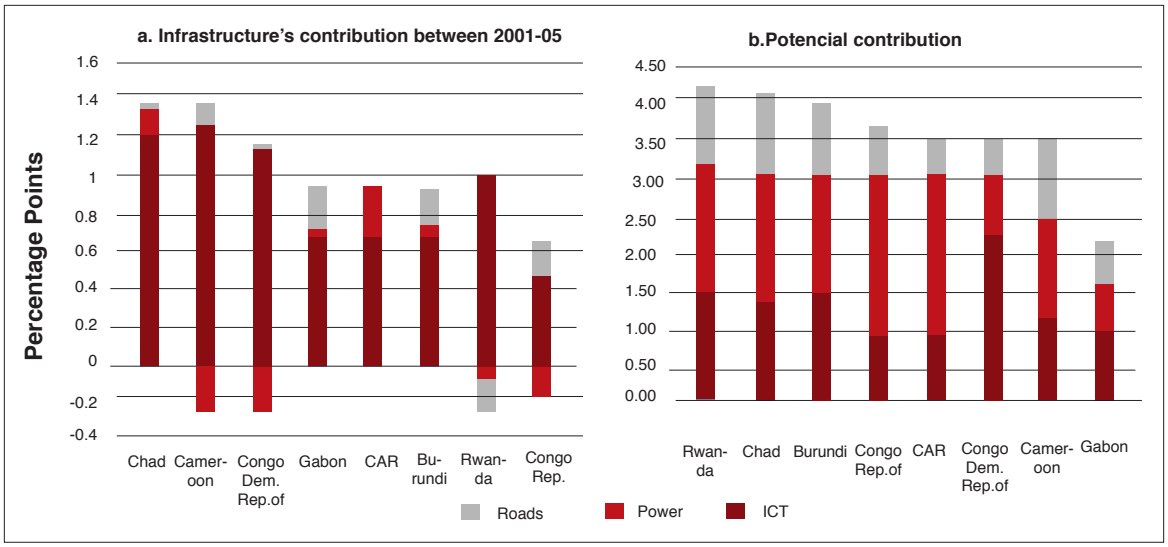


Atsa et al. (2016) concluded that after having re-examined the seven pillars of a digital economy, Cameroon, which is in constant quest for prosperity and economic growth and hinged on a digital transition of enterprises and institutions, urgently needs to draw on a multi-sectoral and multi-actor approach to develop a clear road map for this transition. The focus in this road map shall be on the appropriation of digital technology in business, development of a strong ICT sector, and the establishment of a favorable environment for digital companies. With such a map that responds to new trends and forces—including mobile, social media, cloud computing and massive data, open data (public and private), an increased use of smartphones and digital tablets, the exploitation of optical fiber and 4G networks, and birth and growth of digital companies and civic groups that challenge the regulatory and operational environments—Cameroon will be on course to become a global leader in innovation in the central Africa sub-region. Although the government has launched several projects to improve the post, telecommunications, and information and communication technologies infrastructure to enhance access, these efforts continue to fall short of expectations.

Several studies, including enterprise surveys, have revealed the importance of appropriate infrastructures' contribution to the annual per capita growth and how poor infrastructure, including ICT infrastructure, is a deterrent to business in Cameroon. A comparative analysis of several Central African countries shows that firms are notoriously facing about 42% of the productivity gap, as shown in figures 6a and 6b.

Figure 6:

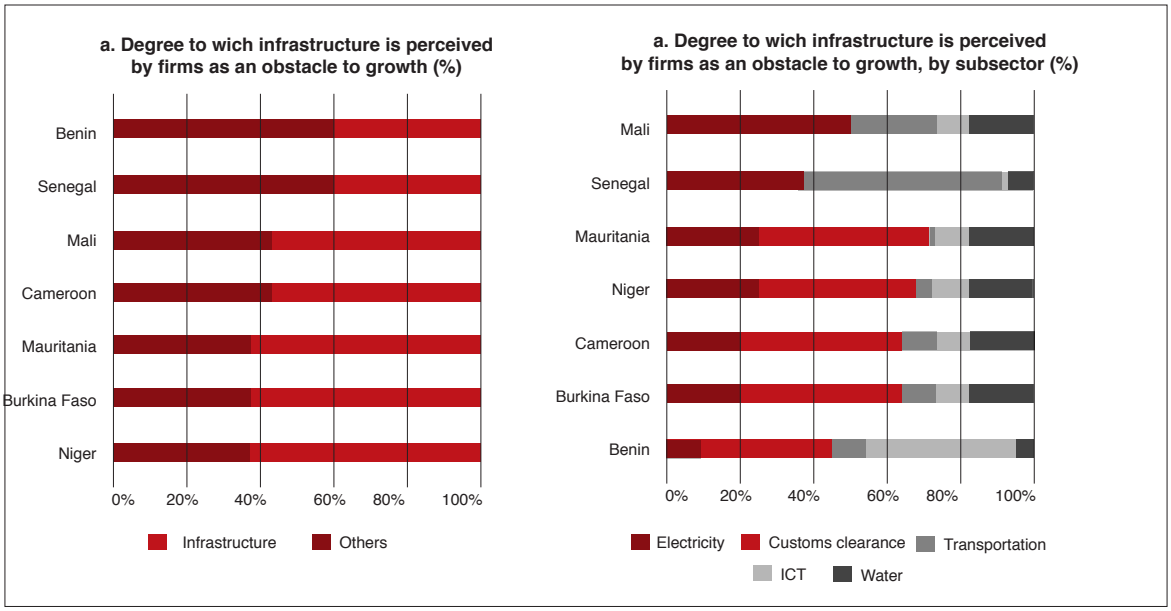
Infrastructure's contribution to annual per capita growth in Central African countries (2001–2005)



(Source: Caledron (2009)

Figure 7:

Infrastructure deficits' constraints on firms' productivity



(Source: Escribano et al. (2010)

III.

Analysis of ICT legal environment and access to the Internet in Cameroon

The evolving telecommunications and ICT policy environment has been influenced by the growing importance of these forces, which are central to every modern economy. These changes have ushered in a plethora of laws and regulations to create an enabling environment for this new economy with significant milestones pertinent to 1960–1988, 1988–1998, and 1999–present periods (Atsa et al., 2016; The Sector Strategy for Telecommunications and ICT, 2005–2015).

III.1

The period 1960–1988

From 1960 to 1970, MINPOSTEL was in charge of orientations, regulation, control, operation, follow-up, and monitoring of telegraphy, telex, Morse, and telephony. This period was also marked by the creation of the National Advanced School of Post and Telecommunications (ENSPT) in 1969 and the International Telecommunications of Cameroon (INTELCAM) in 1972, separating domestic and international telecommunication opera-

tions. Significant resources were deployed to enhance the operations alongside these institutional developments. The head of state passed into law legislation No. 87/021 on 17 December 1987, granting financial autonomy to MINPOSTEL to enhance efficiency and meet the ever-increasing financial needs. This effort, however, did not culminate in improved telecommunication services.

III.2

The period 1989–1998

This period was marked by the first efforts to digitize the sector with the acquisition of the Yaoundé and Douala Digital Exchange Stations followed by the South West Station. Due to the inertia of the telecommunications sector stagnation in the number of telephone lines of the national network, more legislation was adopted, and new institutional arrangements were made in 1998 to inject new dynamism into the sector, including:

•A new legal and regulatory telecommunications framework laying the groundwork for competition on internal markets in the sector (Law No. 098/14 of 14 July 1998);

•Decree No. 98/198 of 8 September 1998 to set up CAMTEL;

•Separation of postal activities from telecommunications and ICT;

•Setting up an independent and autonomous Telecommunication Regulatory Agency (ART);

•The birth of CAMTEL out of a merger between the Department of Telecommunications of MINPOSTEL and INTELCAM in 1998, giving it exclusive rights to the operation and provision of fixed telephone services.

However, all the legislative and institutional arrangements had limits, including unclear or incoherent implementation strategies for developing the sector, inadequate infrastructure, insufficient resources, and poor involvement of national and international private sector players (The Sector Strategy for Telecommunications and ICT, 2005–2015; NAICT, 2007).

III.3

The period 1998 to date

During this period, Cameroon's head of state gave priority to the telecommunications and ICT sector. Many other laws were enacted, geared toward preparing a friendly, legal, and regulatory environment for the modern and digital economy, including:

•Law on the prescription of minimum services in the communication sector in 2001 (NA_MSC, 2001);

•Decree No. 2001/830/PM of 19 September 2001, which laid down modalities for the operation of telecommunication networks;

•Decree No. 2001/831/PM of 19 September 2001, which laid down modalities for the provision of telecommunication services;

•Law No. 2001/10 of 23 July 2001, which instituted minimum service in the telecommunications sector;

•Law No. 2005/13 of 29 December 2005, which amended and supplemented some provisions of Law No. 98/14 of 14 July 1998 for governing telecommunications in Cameroon.

In 2004, the head of state declared that "our country needs generalized access to the Internet," reiterating a similar statement that he had made in 1997 while addressing Cameroon's youths. This speech ushered in a new set of laws to boost the sector, including:

•2010 Law, relating to electronic communication (NA_EC, 2010). This law sought to promote universal service in the country. This law required Cameroon's telecommunication operators to provide "communications services of good quality, at affordable rates, and in an uninterrupted manner";

•2010 Law, relating to electronic commerce (NA_eC,2010);

•2010 Law, relating to cybersecurity and cyber criminality in Cameroon (NA_CSCC, 2010);

•2011 Law on consumer protection (NA_CP, 2011). This Law was enacted to protect consumers by providing for individual or collective legal action, authorizing Cameroon's telecommunications regulator, TRB, to mediate and settle conflicts in the case of non-compliance by operators (AI4A, 2014).

Internationally, Cameroon plays a leading role and is a signatory to many binding international obligations that bear on the subject. Notably, the New Partnership for Africa's Development (NEPAD) is committed to the realization of the Millennium Development Goals (MDGs) (2010–2015) and the Sustainable Development Goals (SDGs) (2015–2030) and is keen on making use of the potentials and opportunities offered by ICT to address poverty and promote inclusive development. Many cutting-edge and innovative initiatives have been employed by the government, including:

• The drawing up of a government-backed program of action for the information- and knowledge-based society by MINRESI;

•The implementation of an ICT strategy by the Ministry of Higher Education;

•The use of ICT to manage staff and personnel by the Ministry of Public Service and Administrative Reforms by setting up an Integrated Computer Management System for State Personnel and Salaries (SIGI-PES);

•The creation of the ANTIC;

•The interministerial steering committee on the inclusion of ICT components in all projects.

These initiatives have all been in line with external initiatives, notably those by Economic Commission for Africa on the definition of NICI Plan and the UNDP initiative on ICT policy in Cameroon within the framework of TICAD II.

Since 1998, Cameroon has been making significant efforts to create an enabling environment with the sector backed by "Law No. 98/014 (1998 Telecommunication Act)," the establishment of Telecommunications Regulatory Agency (TRA), and the publication of the National Policy for the Development of ICT in 2007. From 1998 to 2017, although the management of Post and Telecommunications was the prerogative of MINPOSTEL, the opening and regulation of the telecommunications market and the granting of licenses were entrusted to TRA with the sector characterized by power struggles amongst the many governmental players claiming authorship or supervision of the national ICT policy, negatively impacting the growth and development of the sector (AI4A, 2014; InfoDev, 2007). To address these power struggles, especially between TRA and MINPOSTEL, a prime ministerial decree set the "conditions to establish or operate networks and provide electronic communication services under the license regime." The decree states that operating licenses are issued by the minister in charge of telecommunications and based on proposals from the regulatory agency, a role which was played solely by TRA up to 2010.

Additional legislation has been enacted in an attempt to bring order to the sector, including Law No. 2010/013 of December 2010 for governing electronic communications in Cameroon; this law sought to promote universal service in the country. Under this law, Cameroon's telecommunication operators are required to provide "communications services of good quality, at affordable rates, and in an uninterrupted manner." In 2012, framework Law No 2011/012 was enacted to protect consumers by providing for individual or collective legal action, authorizing Cameroon's telecommunications regulator, TRB, to mediate and settle conflicts in the case of non-compliance by operators (AI4A, 2014). However, some major loopholes have been identified in Law No. 98/14 of July 1988 (i.e., the main legal framework regulating telecommunications in Cameroon), which makes no reference to mobile telephone services and access to the Internet.

As pointed out in the NAICT 2007 report, the plethora of laws that have failed to take into consideration important issues, such as intellectual property rights, e-trade or Electronic Data Interchange (EDI), and infrastructure sharing policy, add to the confusion in the sector and impede their contributions to Cameroon's economy. However, with the advances in the policy and legal environment, the NAICT states that "… the context is thus favourable for strong action towards defining a bold ICT development and deployment policy and for formulating effective and coherent strategies to speed up Cameroon's access to the global information and knowledge based economy."

IV.

A stakeholder analysis of the players and institutions in the Internet access landscape in Cameroon

Atsa et al. (2016) argue that for a successful digital economy, which depends on new technologies (e.g., the Internet), disruptions must be avoided, and for this to happen, stakeholders must be engaged from all the economic strata of the country (public sector, private sector, and civil society). This allows drawing on stakeholders' viewpoints to identify and address various challenges in a participative manner.

Table 3:

Summary of the main public and private sector stakeholders in Cameroon's telecommunications and ICT industries

Source: Eric Ngang (2018); adapted from Atsa et al. (2016) and Sector Strategy for Telecommunications and ICT (2005–2015)

Stakeholder	Mission
Presidency of the Republic of Cameroon (PRC)	Formulating the national policy on the development of ICT.
NAICT	Being directly responsible for laying down guidelines and regulations for the ICT sector in Cameroon; is placed under the technical supervision of PRC.
Ministry of Finance ('Ministère des Finances") (MINEFI)	Representing the State in all semi-public corporations. Its other duties include resource mobilization and budget allocation.
MINPOSTEL	•Developing and implementing the government policy of telecommunications and ICT •ICT infrastructure •Coordination •Policies •The supervisory authority of CAMTEL and TRB
National Center for Development of Computer Science (CENADI)	•Advisory •Tools support •Technology adoption, development, and deployment
ART	•Legislation •Regulation •Monitoring telecommunication operators' and users' activities •Allocating assets
ANTIC	•Promoting and monitoring government actions •Regulating electronic security activities •Certification (application and specification of ICT tools)
MINEFI	Carrying out the following tasks in collaboration with ART and MINPOSTEL: •Preparing tender files with a view to issuing tender invitations •Issuing tender invitations •Signing concession agreement and specifications
Ministry of Justice (MINJUSTICE)	Referring complainants' matters to MINPOSTEL or courts
MINCOM	Supervising the activities of Cameroon Radio and Television (CRTV) and Cameroon Tribune and issuing communication licenses to private audiovisual service-based operators.
PRC NA Prime Minister's Office (PMO) Ministry of Vocational Training (MINFOP) MINRESI ART MINPOSTEL Ministry of Commerce (MINCOMMERCE) MINEFI International bodies, such as the United Nations Industrial Development Organization (UNIDO), Industrialization of African Telecommunications (INDAFTEL), etc. Researchers Investors Manufacturers	•Contributing to the development of industrialization policy •Promoting an industrial fabric •Promoting advanced technologies •Promoting jobs

CAMTEL MTN ORANGE ISP Banks Standardization structures Radio/television operators	•Unlimited services/access •Products and services •Developing infrastructures •Fixing and applying charges based on actual costs •QoS
Training schools (Ecole Nationale Supérieure Polytechnique ("National Advanced School of Engineering") (ENSP), ENSPT, IUT Universities, IAI, Institut Siantou, Institut Ndi Samba, ICT University, etc.)	•Conceiving, designing, and following up on programs' implementation •Updating school programs •Organizing examinations and competitive entry examinations •Organizing training courses and seminars •Sensitizing the general public •Organizing seminars
Non-Governmental Organization (NGO) Development partners (bilateral and multilateral partners)	•Training the general public •Holding specialized training •An attractive framework plays an important role in the promotion, integration, and deployment of ICT in national programs

V.

Analysis of the level of connectivity and percentage by different strata of the population

Despite Cameroon's significant advantages in the Central Africa sub-region—such as strategic position, a broad variety of cultural assets, relative stability, excellent human resources, infrastructure potential, and a major access route by sea to many landlocked countries—ICT penetration and usage are comparatively low (NAICT, 2006). According to a national survey (SCAN ICT), conducted by MINPOSTEL and supported by other partners, in 2006, 30% of the country had access to telephony services, with a fixed teledensity of 0.7% and mobile teledensity of 15%. The report further indicated that fewer than 7% of institutions and enterprises had a computer, and fewer than 27% of government services had Internet connectivity. The report added that, generally, fewer than 2% of Cameroonians used the Internet.

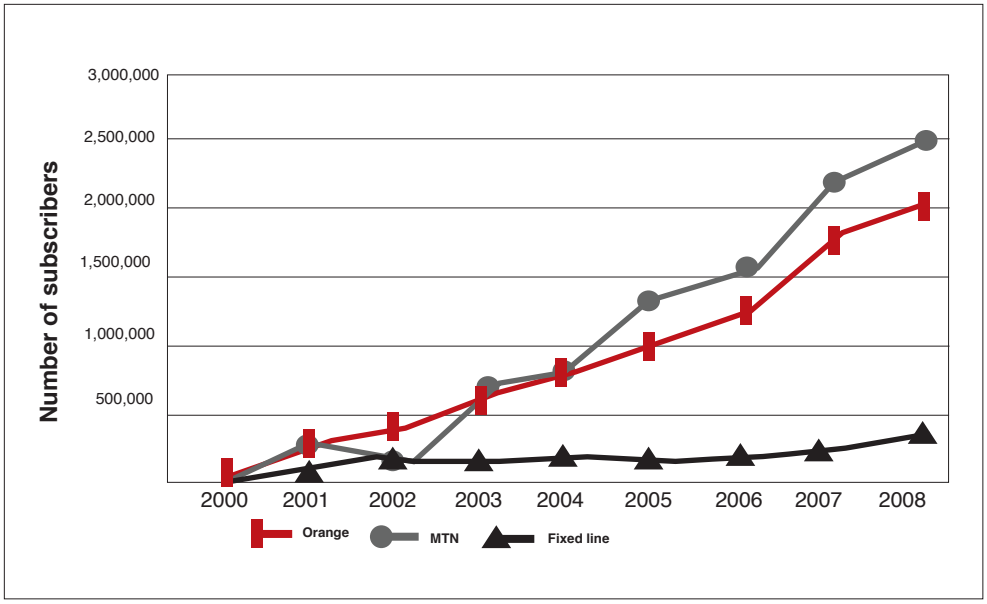
Yet, Cameroon has a huge potential to become a major

ICT hub in the Central African region. In fact, the educational system, particularly higher education, despite its many problems, is fairly developed and could serve as a formidable ICT starting point in Central Africa. On the other hand, the country is endowed with a fiber optic backbone along the Chad-Cameroon pipeline, which is still underutilized. Similarly, a landing point of the South African Telecommunication 3 (SAT 3) submarine cable is open in Douala with a capacity of 2.5 gigabits. Two private mobile phone companies and one state-owned fixed phone company (already engaged in a privatization process) equally invested about 300 billion CFA francs from 1999 to 2004.

The years 1998 to 2008 witnessed a rapid growth in Cameroon's mobile telephony, which placed the country one of the leading markets in Central Africa with around 4.5 million subscribers. During this period, the fixed-line penetration grew rapidly, with the expansion of limited-mobility portable phones offered by CAMTEL—the major operator that offered a fixed-line solution with mobility of up to 40 kilometers and launched both mobile and fixed handsets in 2006. Two years later, users of this technology increased from 28,000 to 150,000, surpassing the number of traditional fixed lines in the country (125,000). The number of landline subscriptions per 100 people grew from 0.6 in 2000 to 2.2 in 2009

Figure 8:

Infrastructure deficits' constraints on firms' productivity



(Source: AICD database)

Similar to the preceding years, strong growth in the volume of voice traffic from mobile network sources was recorded in 2016, which saw the entry of more competitors into the market. Mobile operators' introduction of mobile broadband encouraged the operators to restructure the commercial policies; this move resulted in a wide range of unlimited and bundled services, ensuring an economy of scale and allowing evolution in the traffic while assuring a reduction in prices for the end users. TRB states that these attractive value-added commercial services caused an explosion in the voice traffic; the multitude of competitive services offered by the old and new operators saw their consumption reach 15,88 billion minutes in 2016 (TRB 2016).

Table 4:

Cost of voice/Internet connections and interconnections in Cameroon (2002–2016)

Source: TRB (2016)

Tarifs d'interconnexion					Tarifs de détail /on net/ en heures pleines			
Tarif/an	**ORANGE**	**MTN**	**Viettel**	**CAMTEL**	**MTN**	**ORANGE**	**Viettel**	**CT Phone (CAMTEL)**
2002	145	144	-/-	56	270	250	-/-	-/-
2003	90	90	-/-	69	240	250	-/-	-/-
2004	80	83	-/-	80	240	250	-/-	-/-
2005	69	69,8	-/-	69	240	250	-/-	-/-
2006	58,5	58,5	-/-	55,5	200	200	-/-	70
2007	58,5	58,5	-/-	55,4	200	200	-/-	70
2008	47,8	45	-/-	50	160	150	-/-	70
2009	45,5	45	-/-	48	160	150	-/-	70
2010	41	41	-/-	48	90	89	-/-	70
2011	38	38	-/-	45	90	89	-/-	70
2012	35	35	-/-	40	60	89	-/-	70
2013	30	30	-/-	32	60	89	-/-	70
2014	29	29	35	30	60	60	35	70
2015	26	26	28	30	60	60	28	70
2016	26	26	28	30	61	61	28	70

Despite these advances, some actors and institutions have identified major constraints, such as high costs of services and equipment, spatial disparities, and insufficient offer, among others, which constitute the major impediments to the growth and usage of ICT, particularly, the Internet by individuals, families, enterprises, and government services. NAICT's recent report indicates the following:

•The Internet fees are exorbitant compared to Cameroonians' level of income required for the provision of the requisite services at an acceptable speed; this has an adverse effect on households' Internet demand.

•The pace of computer penetration at the institutional level is extremely low with 66.2% of institutions having no computer; similarly, the number of workers who can access a computer at their workplace is comparatively very low.

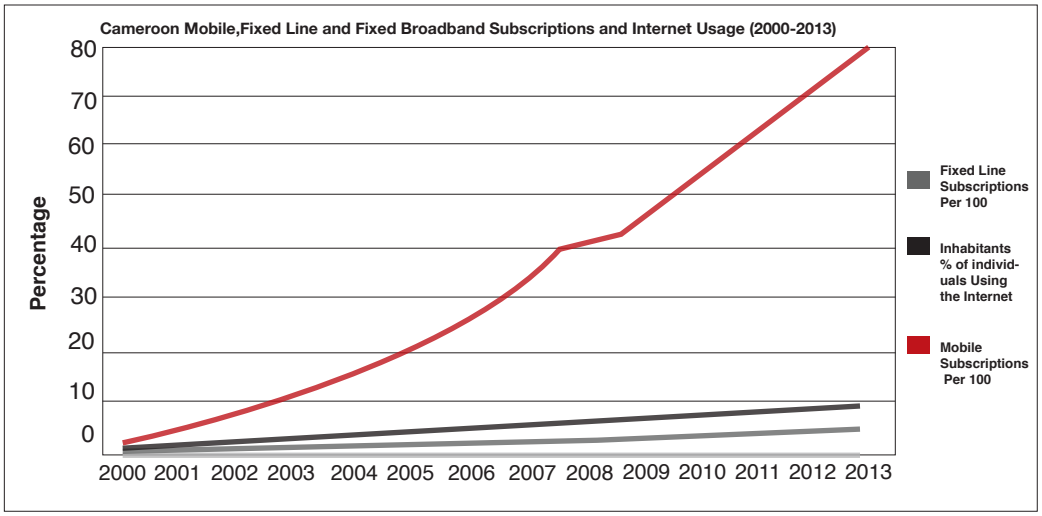
•Approximately 9.2% of the institutions are connected to the Internet, with nearly 10.8% of them having a website.

It is increasingly becoming apparent that the existing potentials can help Cameroon turn into a major ICT hub in the Central African region. Significant resources have, thus, been deployed for major investment projects, such as the reforming of the legal environment and the developing of major institutions and projects. Besides making use of the many endowments (e.g., the fiber optic backbone along the Cameroon-Chad pipeline), the South African Telecommunication 3 (SAT 3) submarine cable opened in Douala with a capacity of 2.5 Gigabits, sponsored by significant investments by a state-owned company and two mobile phone operators.

Cameroonians' access to the Internet significantly evolved, with a growing Internet penetration rate averaging 14% annually between 2007 and 2011 and 19% between 2012 and 2017, albeit below the 32% of the continent-wide penetration (Alliance for Affordable Internet A4AI, 2014; Doing Business in Cameroon, 2017; Global Internet Open Information, 2017). Despite the impressive progress with modern infrastructure development and growing number of licensed operators, different authors and institutions indicated that Cameroon had one of the lowest Internet usage rates in Africa and was one of the least connected countries in the world, with only 6% of its population being online in the period leading up to 2013 (ITU, 2013; Internet Live Stats, 2013; Nana and Tankeu, 2012) (see Figure 9).

Figure 9:

Internet usage and fixed line, mobile, and fixed broadband subscriptions (2000–2013)



(Source: ITU (2013)

Between 2014 and 2016, Cameroon's access to the Internet grew tremendously and ranked the country among the top 100 countries in the world with improved Internet access and among the top 30% of three countries in Africa that recorded significant improvements (see Table 5 below on Cameroon's progress).

Table 5:

Statistics on Internet users and penetration percentage rate vis-à-vis the population (2014–2016)

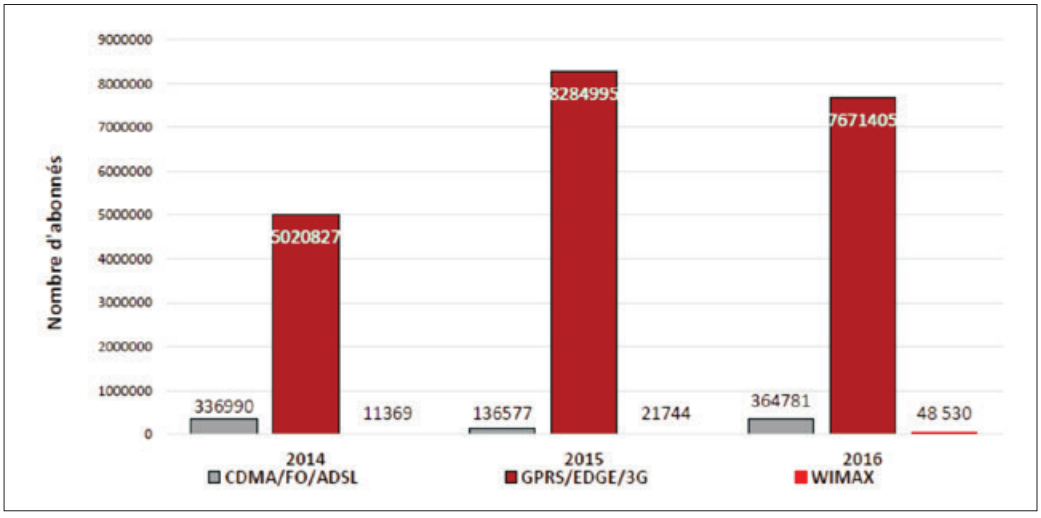
Source: Ngang (2018), adapted from Internet Live Stats (2014, 2015, and 2016)

Year	Position (out of 195 countries)	Internet users	Penetration (% of Pop)	Population
2014	93	2,505,032	11%	22,773,014
2015	82	3,701,585	15.9%	23,344,179
2016	78	4,311,178	18%	23,924,407

The estimates from Internet Live Stats indicate that 4.3 million Cameroonians, constituting approximately 20% of the population, had access to the Internet in 2016. In this period, a report on mobility, published by the management of the Cameroonian subsidiary of the Swedish telecommunications firm Ericsson in December 2016, indicated that the access rate in Cameroon reached 25.6% at the end of December 2015. These figures reveal that over the same period the Internet access in Cameroon was higher (only 20%) compared to the other countries in the sub-Saharan African region.

Figure 10:

Internet penetration rate (2014–2016)



(Source: TRB (2016)

This growth corresponds to the launch of the 3G and 4G services by MTN and Orange during this period and the rapid growth in the use of smartphones by mobile subscribers, with MTN registering an increase of 34.1% with 2.6 million devices registered by the end of June 2016. Generally, similar to other countries in sub-Saharan Africa, mobile telephony in Cameroon has grown much faster than the Internet usage. ITU cites Cameroon's mobile penetration rate as 61%, with 17% of the mobile users estimated to own mobile phones (M&C Saatchi Mobile, 2013). This correlates with the TRB 2016 Annual Observatory that indicates that 40% of the 18 million mobile phone operators were connected to the Internet via phone as more subscribers had smartphones. The report further states that subscription to the Internet from the operators of fixed networks witnessed a sharp rise of 167.08% in 2016.

Although the divide in urban-rural voice communication is narrowing, the urban-rural Internet communication divide is widening. This relatively high mobile penetration rate may present Cameroon with an opportunity to increase the Internet and broadband use rapidly. A survey conducted by Research ICT Africa in 2011 and 2012 showed that in Cameroon only 30% of the Internet users used their mobile phones to access the Internet, with the majority still using an Internet café to access the Web. Many Cameroonians do not use their mobile phones to access the Internet as a result of limited consumer choice in the mobile market, caused by an apparent lack of competition in Cameroon (Research ICT Africa, 2012).

The provision of licenses with terms and conditions that promote investment in 3G and 4G infrastructure and services by diverse operators is an affirmation of Cameroon's Government of its commitment to increasing broadband. Therefore, the government is anticipated to enhance the usage of mobile telephony to help enhance affordable Internet access in Cameroon, especially with the growing use of smartphones.

Despite this progress, the 2017 Business report claims that the Web continues to remain inaccessible to most Cameroonians. This assertion is also supported by the NAICT 2016 report that confirms wide disparities in access to ICT arising directly from geographical issues, level of income, and users' level of education.

Despite all these projects and a good percentage of mobile telephone subscription, Cameroon continues to experience a very low percentage of individuals using the Internet, although there has been a remarkable growth in voice communication or telephony. Table 7 shows that this percentage is around a third of that of Africa (World Bank).

Table 6:

Comparison of telecommunication indicators in Cameroon, Africa, and the world

	Cameroon	Africa	World
Fixed-telephone subscriptions	3.59%	1.30%	16.20%
Mobile telephone subscriptions	70.39%	65.90%	93.10%
Fixed (wired)broadband subscriptions	0.08%	0.30%	9.40%
Percentage of Individuals using Internet	6.40%	16.80%	37.9%

Cameroon has a population of 24,229,247, with 12,114,634 (50.1%) being female and 12,114,613 (49.9%) being male (Countrymeters, 2018). Whereas the average density is 35 inhabitants per square kilometer, there are important differences among the regions. In the south and east, the average density is five inhabitants per square kilometer, whereas, in the west and north, population density exceeds 200 inhabitants per square kilometer. There are many digital disparities between urban areas (mainly Douala and Yaoundé) and rural areas (NAICT). It is estimated that about 50% of Cameroon's population lives in urban areas, which accounts for the largest share of the country's economy and explains why the ICT backbones are concentrated in urban areas, in particular around Douala and Yaoundé. Since 1998 and in tandem with growing competition in mobile telephony sector, aimed at providing network coverage throughout the country, mobile operators who are profit-driven and highly interested in returns on their investments have found the urban and populous regions more attractive for business. As a result, the coverage of the rural areas has been the prerogative of the government who, in an attempt to address this gap, launched the Multipurpose Community Telecentres (MCTs) project in 2013. This project was designed to bridge the digital divide between rural and suburban areas, often neglected by private operators and urban areas; the project involved installing infrastructure, offering affordable telecommunication and ICT services (telephone, fax, photocopying, television, Internet) and postal financial services (money transfer and messaging). Today, 177 MCTs, 52 Digital Access Points, and two Digital Agricultural Centers are operational across the 10 regions, with 10 (out of 20,000 MCTs) planned for construction by 2015 (Cameroon Tribune, 2013; Ebongue, 2015). However, the MCTs are not equitably distributed. For example, the estimated population of the northwest and south regions in 2013 were 1,900,547 and 761,099, respectively; however, paradoxically, the south region with a smaller population had 29 MCTs compared to 10 in the northwest region with a larger population (Table 8). Thus, it can be deduced that the efforts noted above have not been very successful in addressing the digital gap.

Table 7:

Regional distribution of MCTs, Telecenters, and Digital Access Points across Cameroon

Source: Ngang (2018), adapted from NAICT (2016) and MINPOSTEL (2017)

Region	Population (2013 est.)	Telecenters	Digital Access Points
Adamawa	1,481,433	11	3
Center	3,919,828	28	5
East	824,204	15	6
Far North	3,803,138	20	8
Littoral	3,174,437	14	5
North	2,311,179	13	6
Northwest	1,900,547	10	7
South	761,099	29	6
Southwest	1,481,433	16	3
West	1,865,394	21	3
Total	**21,522,692**	**177**	**52**

Since their inception, these projects have generated considerable enthusiasm. However, their deployment was stalled a few years later. NAICT's Sector Strategy for Telecommunications and ICT report (2005–2015) mentioned that the challenge facing Cameroon's public administrations was that they lacked appropriate information-processing infrastructure and ICT services and that the existing organizational or rational approaches would not help in updating or modernizing systems and structures.

Several players and institutions have blamed poor connectivity and high digital divide between rural and urban areas on the exorbitant cost of Internet connection in Cameroon. A requirement to increase the deployment of Internet services in Cameroon is the reduction of connectivity and bandwidth costs and improvement in the QoS.

The deployment of the optical fiber and setting up of an IXP, interconnecting ISPs with a local Internet traffic exchange, can reduce the costs involved in transiting through multiple international hops to reach required destinations. This will ultimately lead to a boost in the domestic Internet enterprise as there is an increase in the demand for bandwidth and domestic Internet services (e-government, e-commerce, e-banking, Web services, content hosting).

VI.

An estimate of the socioeconomic impact of the Internet cuts in the English-speaking region of Cameroon

There is no gainsaying that ICT plays a critical role in the development of sectors, such as banking, finance, governance, education, health, and insurance, which are the backbone of the socioeconomic development of every nation.

This is in addition to its important role in enhancing good governance through effective citizen participation in decision-making processes and the promotion of a voice-response mechanism between duty bearers and right holders. Citing the case of social media—a Web-based technology that uses desktop computers and mobile phones to create highly interactive platforms through which individuals, communities, and organizations can share, co-create, discuss, and download text-based information and images online at an alarming speed—Dr. Tatah Peter Ntaimah, a Cameroonian medical anthropologist, states categorically that no modern community can prosper without the use of ICT, which has introduced landmark changes in the traditional media (print, radio, and television) with far fewer violations compared to its importance (Cameroon Tribune January 16, 2017, p. 7).

VI.1

Implications of ICT shutdown on the socioeconomic sectors in Cameroon

In the second part of this research, the author seeks to discuss the socioeconomic impacts of the Internet shutdown from the perspective of the end-users of these ICT services vis-à-vis other published sources. Several authors and institutions (Gueririo, 2014; Sector Strategy for Telecommunications and ICT, 2005–2015) have pointed out that the Internet and online app shutdown will have significant impacts on the following sectors:

1. Financial inclusion
2. Social inclusion
3. Health
4. Education
5. Agriculture
6. Tourism

VI.2

ICT, education, and research sector

The ICT sector is a key contributor to the development of human resources and knowledge production and generation through schools, colleges, universities, and research institutes nationwide. Although the government is making significant efforts through major projects, such as the construction of multimedia resource centers in selected public schools with the Internet connection and construction of telecommunication network linking all state universities and higher institutes of learning and research with a connection to the Internet, the head of state's offer of 500,000 laptops to university students is a step toward addressing the computer/student ratio in higher education. Although these initiatives and projects can help this sector play the catalyst role in developing and deploying ICT throughout the country, much more is still needed to be done. Unfortunately, the shutting down of the Internet in a region where the government was trying to address the issue of school boycott only harms the sector that has been referred to as one of the best in the country.

VI.3

ICT, health, and social welfare sector

The challenge of the lack of equipment and access to ICT infrastructure needs to be addressed for the better management of health and social welfare issues. In his message to the nation on 31 December 2017, Cameroon's head of state indicated that one of the government's priorities in the coming years was providing quality and universal healthcare to Cameroonians and progressively establishing a universal health coverage system. According to the National Inter-Sector Technical Committee, the operation of this system entails the establishment of a single national structure in charge of technical and financial management of health coverage with biometric registration at designated registration points (CRTV, 2018). Should this initiative succeed, massive development and deployment of wide-scale ICT applications, especially the Internet, will be needed to ensure that this remains

a very inclusive process. In addition to managing those who are concerned about the welfare and social security, the advances in the ICT sector will support the ongoing public debates on innovative approaches to address health issues, including telemedicine.

VI.4

ICT, production, and trade sector

The deployment of ICT, especially the Internet, is key to boosting the production and trade sectors to facilitate management duties (administration and finance), commercial duties (purchases and marketing), and production duties. Enterprises that make use of ICT, especially the Internet, are at the forefront of the promotion of the digital economy, with a cross-section of them being actively involved in e-transactions (e.g., online banking transactions), although the rate of penetration is relatively low compared to those that are actively using e-transaction applications on legal and tax issues. Even the public and private institutions that have set up interactive websites have failed to introduce systems that can update these sites or render them fully functional. For example, the National One-Stop-Shop for external trade transactions (known in French as "Guichet Unique des opérations du Commerce Extérieur," www.guichetunique.org) has not been operational for a long time (NAICT, 2007). Innovations central to the growth of the e-commerce sector (e.g., the Internet and mobile telephone banking and transactions) that have become commonplace in other contexts are only recently arriving in Cameroon and are still at a very embryonic stage of development.

Online information on the agriculture sector, which is considered one of the mainstays of the country exporting several basic commodities, is almost absent or scanty. Essential information such as the main players in the agriculture chain (producers, consumers), early warning systems related to emerging markets, weather-related risks, disasters, stocks, and prices are yet to be developed, thus leaving producers and those on the demand side for agriculture produce ill-informed. The lack of ICT in rural areas, as agriculture hot spots, further entrenches the disparity between local producers (suppliers) and players in urban foreign markets who are in constant demand for local produces.

VI.5

ICT, culture, and leisure sector

The Internet can be an ideal platform for showcasing digitalized artworks as a major business in the tourism and leisure industry. However, Cameroon continues to grapple with the issue of inadequate content production from its museums, libraries, archives, and relevant institutions of culture, which poses a major obstacle to the prosperity of the tourism, culture, and leisure industry in Cameroon. The negative messages propagated through social media have been fueling the slump in the tourism sector in two regions, with room booking rates falling from 61% to 45.66%; this is despite additional investments in the sector with 300 rooms added to the existing 2,122 ones. Tables 8–11 present a comparative analysis of trends in the hotel sector in the northwest region of the country.

Table 8:

Third-quarter statistics in the hotel sector

in the northwest region (2016)

Source: Cameroon Tribune

Month	Rooms available	Rooms occupied	Arrivals	No. of nights	Turnover in CFA franc
July	2122	1294	3589	5003	33,200,250
August	2122	1399	3700	5728	49,597,000
September	2122	1241	3197	4561	47,594,601

Table 9:

Third-quarter statistics in the hotel sector

in the northwest region (2017)

Source: Cameroon Tribune (8 December 2017, p. 9)

Month	Rooms available	Rooms occupied	Arrivals	No. of nights	Turnover in CFA franc
July	2422	1106	1887	2258	18,048,500
August	2422	1111	1690	2030	16,804,500
September	2422	1084	1555	2178	27,110,000

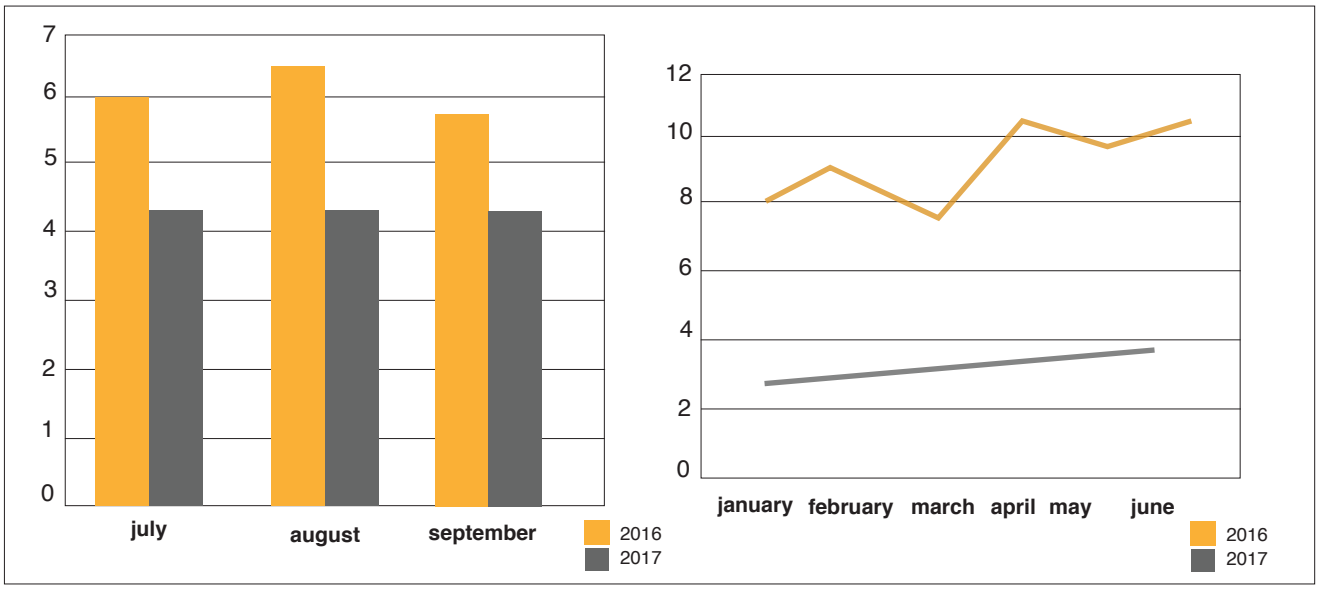


Table 10:

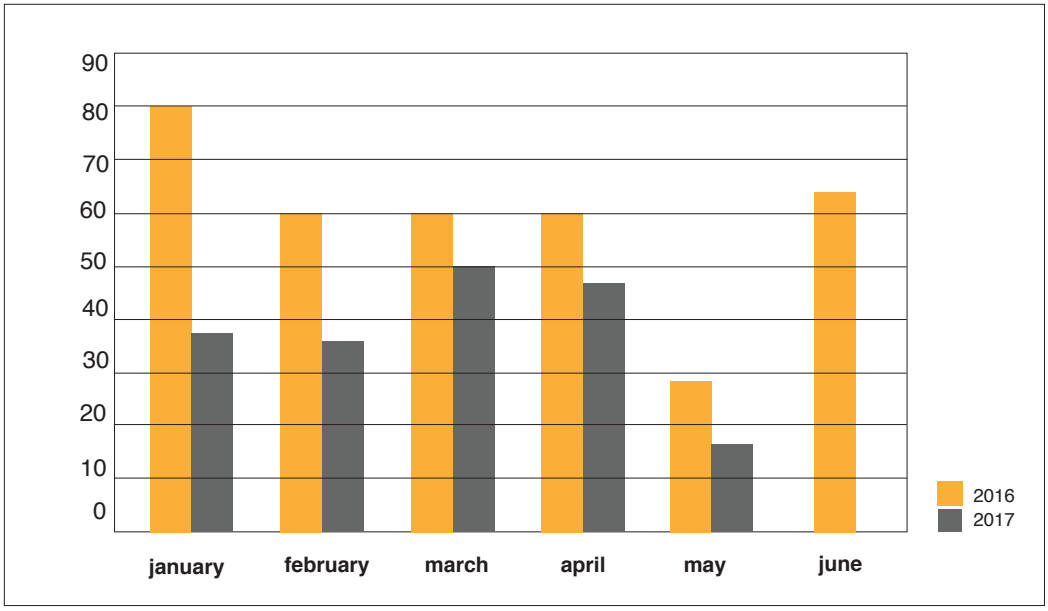
Revenue in the hotel sector in the first half of 2016 in the northwest region

Month	
January	87,200,505
February	71,011,609
March	72,711,474
April	70,138,776
May	42,295,369
June	78,513,995
TOTAL	**421,871,728**

Table 11:

Revenue in the hotel sector in the first half of 2017 in the northwest region

Month	
January	40,787,232
February	39,710,514
March	56,221,166
April	53,422,560
May	23,129,240
June	22,634,515
TOTAL	**235,905,227**



Source: Northwest Regional Delegation of Leisure and Tourism (published in Cameroon Tribune 8 December 2017)

The development and deployment of ICT, especially the Internet, will be crucial to boosting other sectors, including:

•Cyber-services and work, with a need for rapid development of e-work enterprises that take advantage of current organizational working methods based on networking; these constitute a major source of job creation for Cameroon, which is grappling with significant challenges, such as unemployment and underemployment.

•Defense and security sector, with a wealth of opportunities and at the time of growing vulnerabilities, such as cyber criminality, with heightened insecurity for citizens and enterprises; these have a direct impact on the sovereignty of the State.

Therefore, despite the existing challenges significantly straining the relationship between service providers and users, the recent phenomenon is that the government is trying to restrict citizens' access to the online space through mobile telephone and the Internet.

VII.

Estimating the cost of Internet disruption in Cameroon

Studies investigating the economic impact of the disruption of the Internet, especially for the sub-Saharan countries, are limited. Globally, two studies with high methodological clarity and rigor published by Brooking institution and Deloitte in 2016 are the most notable examples (Darelle, 2016; Brooking Institute, 2016). These studies have highlighted the challenges involved in precisely identifying the type of data that can be used to quantify the impact of very specific types of disruptions, as this would require a level of granularity of data that is beyond the scope of the publicly available information. These studies have also pointed out the limited number of publications that have examined the economic impact of the Internet disruptions concerning identifying the disruptions and collecting relevant data; this is mainly because most studies have focused on their impact on the GDP. For example, it is challenging to quantify the data relating to investors', consumers', and businesses' loss of confidence; it is even more difficult to understand the impact of such disruptions on the informal and thriving economic sector.

It is imperative to design a coherent framework for assessing the effect of disruptions in the region—one that takes into consideration the informal economy besides GDP-based approaches. One such approach has been made public by institutions such as CIPESA; this institution has developed a clear framework for estimating the economic impact of the Internet disruptions (Internet, social media, and App shutdowns) in sub-Saharan Africa.

VII.1

Estimating the impact of the Internet shutdown

To examine the total economic cost of national Internet shutdown, we combine direct and indirect costs as well as country risk premium/cost of capital, as follows:

Total Economic Effect = Internet GDP Loss Estimate (a) + National Estimated Loss Digitization Cost Savings and Efficiency Gains (b) + Country Risk Profile Effects (c)

Where

(a)

= Internet GDP Loss Estimate

= (National GDP* % share of Internet services GDP* duration of the disruption (% of the year based on the number of days the Internet was shut down).

(b)

= Total loss of efficiency gain that would accrue from the digitization of businesses and governments

+ Loss due to weakened confidence arising from Internet deprivation;

*Internet confidence deprivation ratio.

(c)

= Country Risk Profile Effects

= Risk-Free Rate + Beta [Expected Return on Market – Risk-Free Rate + Country Risk Premium]*

VII.2

Estimating the impact of social media and app shutdowns

Total Economic Effect of App Shutdown = App GDP Loss Estimate (direct cost effects)* + National Estimated Loss Digitization Cost Savings and Efficiency Gains + Country Risk Profile Effects (indirect cost effects)

*Share of the revenues from app-based services, such as social media (e.g., WhatsApp, Skype) to total Internet revenue.

Applying this framework to a selected number of countries gives the following economic impact of shutdown per day, as depicted in Table 10.

Table 12:

Estimated economic impact of a total Internet blackout and app disruption per day in USD using CIPESA Framework

Source: CIPESA 2016

Country	Net direct economic effect per day (a)	Net direct economic effect per day (b+c)	Total economic cost of internet disruption per day	Total cost due to app disruption per day
Burundi	82,384	84,032	166,416	41,604
Cameroon	994,703	676,398	1,671.102	417,775
DR Congo	958,867	978,044	1,936.911	484,228
Ethiopia	1,982.856	1,516.885	3,499.741	874,935
Gabon	584,119	297,901	882.019	220,505
Gambia	26,427	26,956	53,383	13,364
Niger	205,726	209,840	415,566	103,891
Republic of Congo	214,617	218,909	433,526	108,381
Togo	120,548	122,959	243,507	60,877
Uganda	1,049.092	713,383	1,762.475	440,619
Kenya	4,125.463	2,191.230	6,316.695	1,895.008

In Cameroon, the Internet, social media, and app shutdowns in two Anglophone regions ran from January to April 2017 and from October 2017 onwards. These two regions were among the most digitally connected in Cameroon, following littoral (Douala) and central (Yaoundé) regions. The two regions' local economy was characterized by banking and microfinance, oil and gas, intensive large-scale and smallholder agriculture supplying local and foreign markets worth 20% of the GDP. The shutdown of the Internet severely paralyzed the economy of these regions with a significant impact on the population and the national economy (ICG, 2016). Several institutions, including the media, have referred to Cameroon's Government action as an outright violation of the constitutional right to freedom of expression and access to information (Cameroon-Info.Net, 2018). Based on the proposed CIPESA Framework, the Internet blackout and app disruption lasted for 246 days. As of 3 February 2018, the total economic costs are as follows:

Table 13:

Estimated economic impact of 246 days of Internet shutdown using the CIPESA Framework

Source: Ngang (2018); rate: 1 USD = 590 CFA francs

Nature of disruption	Number of days (a)	Cost of disruption per day (b)	Contribution to national GDP	Total cost incurred as a result of disruption (aXbXc)
Total economic cost of Internet disruption	246	USD 16,771,102	20%	USD 825,138,218
Total cost of app disruption	246	USD 417,775	20%	USD 2,0554,530
TOTAL				**498,958,721,320 CFA francs**

However, it is worth mentioning that other international organizations have also estimated the national economic losses of shutdown in these two regions (see Table 12). The table does not present the bases underpinning these estimates.

Table 14:

Other institutions' estimated economic impact of the Internet shutdown

Source: Compiled by Eric Ngang (2018)

Institution/Body	Number of days of shutdown	Estimated loss
Internet Sans Frontières	235	USD 39 million
Access Now, using the methodology proposed by the Global Network Initiative and Deloitte	15	USD 723,000, or €675,000, or 443,000,000 CFA francs
International Crisis Group	235	€3 million or 2 billion CFA francs

Table 15:

Other institutions' estimated economic impact of the Internet shutdown

Source: Compiled by Eric Ngang (2018)

Institution/Body	Number of days of shutdown	Estimated loss	Estimated loss in CFA francs
Internet Sans Frontières	246	USD 41 million	24 billion
Access Now, using the methodology proposed by the Global Network Initiative and Deloitte	246	USD 11,857,200	7 billion
International Crisis Group	246	USD 3,559,322	2.1 billion

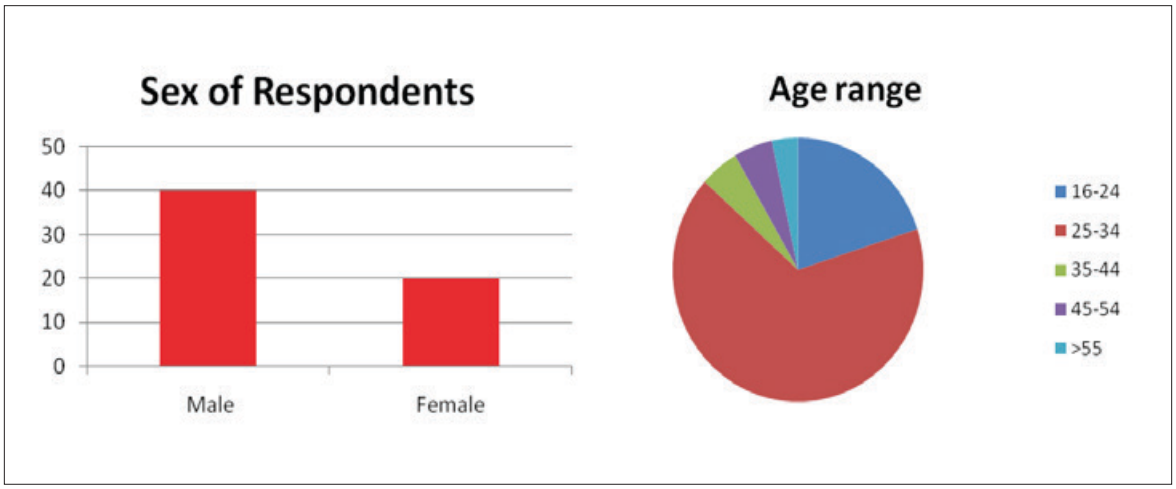
VIII.

What is the perspective of different stakeholders on the socioeconomic impacts of the Internet shutdown in the Anglophone region of Cameroon?

This section analyzes the key indicators through a questionnaire showing the impact on different gender groups in two regions, respondents' sector activities, and how these are tied to the econometric analysis above. The following analysis illustrates that the socioeconomic impacts of Internet disruption are significantly felt by all sectors of society in the two regions currently experiencing the shutdown.

Figure 11:

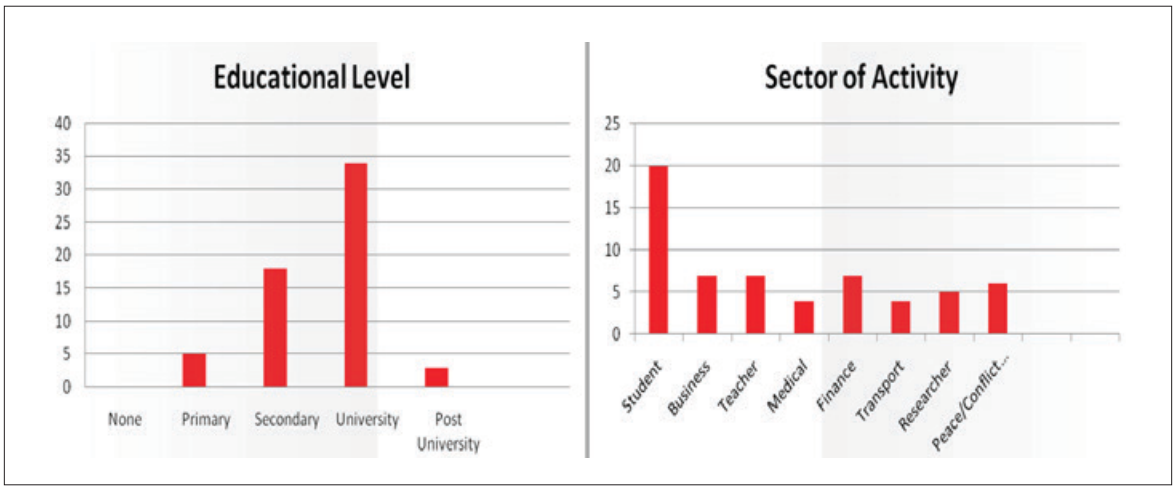
Respondents' gender distribution and age range



Of all the respondents, 67% are male, and the majority are aged between 25 and 34. It can be argued that there is male dominance when it comes to Internet usage.

Figure 12:

Respondents' educational level and sector of activity

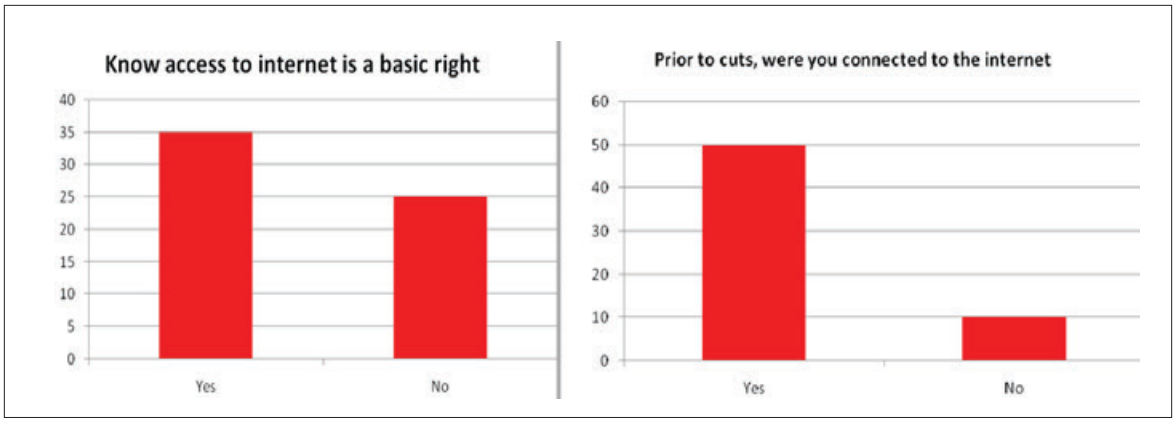


Respondents' major sector of activity is in education, and this correlates with the fact that the 25–34 age range comprises people who are mostly enrolled in different institutions of learning.

.

Figure 13:

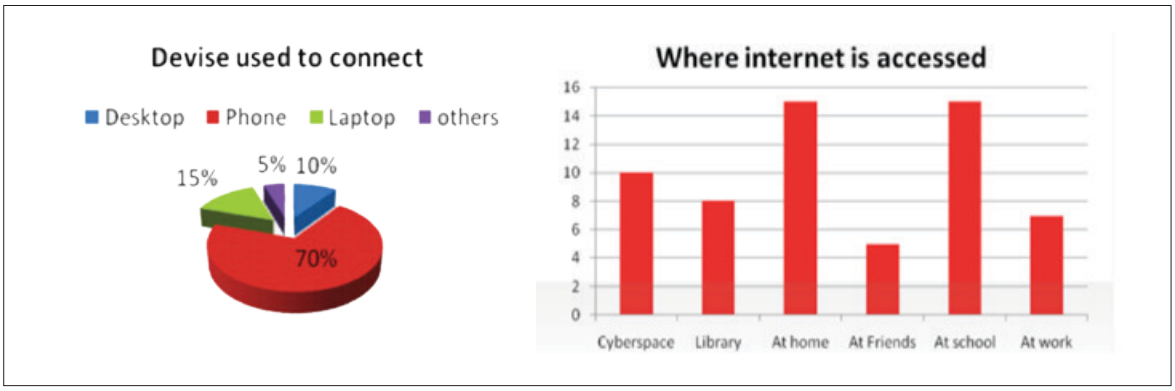
Internet usage and knowledge of the Internet as a basic right



Of all the respondents, 58% indicated that access to the Internet was a basic right, and of this number, 83% had been using the Internet prior to the government shutdown. Therefore, a significant number of respondents did not have access to the Internet as a basic right.

Figure 14:

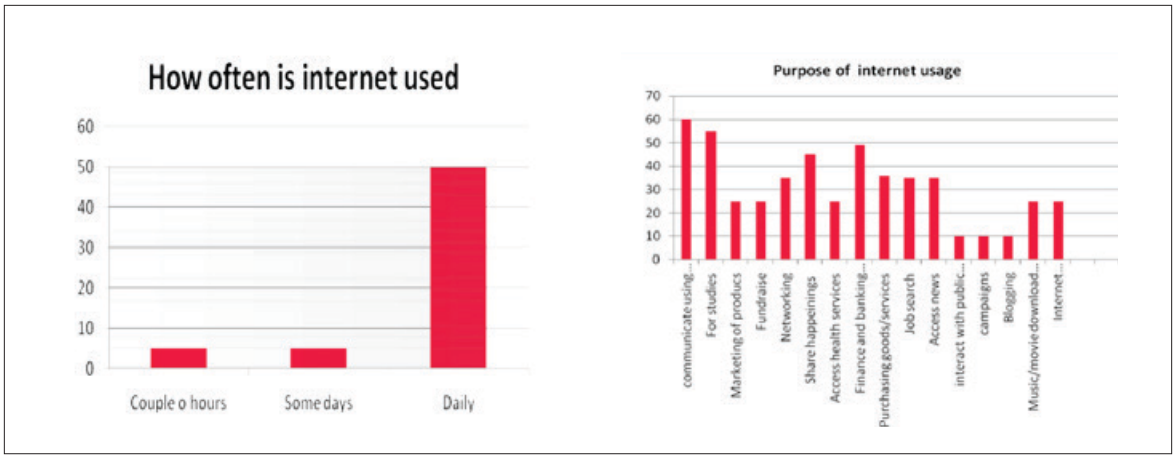
Device used to connect to the Internet and locations where the Internet was accessed



Of all the respondents, 70% indicated that they used their phones to access the Internet, which correlates with the statistics suggesting that the usage of smartphones has been the precursor to the rapid penetration and increase in the user base of mobile Internet. Besides, because of the portability of handheld devices, users accessed the Internet freely while at home or at school and in a variety of other locations.

Figure 15:

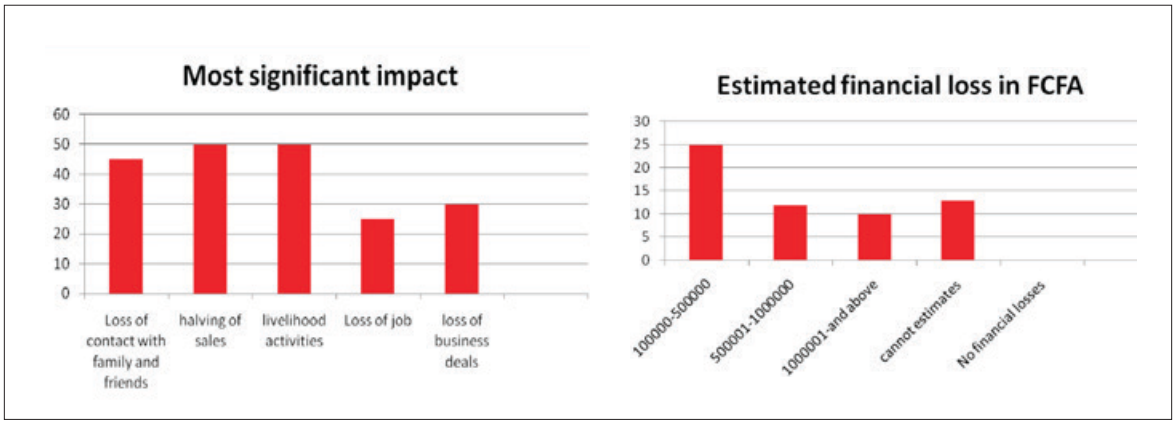
Frequency and purpose of Internet usage



Of all the respondents, 83% indicated that they used the Internet daily and for a wide range of purposes, such as studies, communicating with friends and family (telephone, email, Skype, Imo, WhatsApp, LinkedIn, Facebook), marketing products and services, fundraising, networking with friends and business partners, sharing of happenings around, accessing health services, performing financial transactions, purchasing goods and services, searching for jobs, accessing news through online publications and podcasts, interacting with public authorities, securing and storing files and documents, accessing music, maintaining personal blogs, and debating political issues. Thus, considering these extensive activities, the Internet, social media, and app shutdowns will mean depriving users of all these services and activities, which are dependent on the Internet, and this adds to the total cost of the Internet shutdown for the period of 246 days (as of 4 February 2017) without an envisaged end in sight.

Figure 16:

Estimated economic impacts in monetary terms of the Internet shutdown



Respondents indicated significant negative impacts on their daily activities, including devastating psychological effects caused by loss of contacts with family and loved ones, halving of sales, and losses of jobs and business deals. Although the majority of the respondents (21%) indicated that they could estimate in monetary terms what these losses amounted to, 79% indicated that they had lost at least 100,000 CFA francs. It could be plausible to say that everyone (individuals, businesses, and institutions) in the two English-speaking regions depends on the Internet for one reason or another. Therefore, at an average loss of 100,000 CFA francs per day, with a total population of approximately 3,381,980, it is estimated that a total of 338,198,000,000 CFA francs has been lost during 246 days of shutdown. Although there is a discrepancy between this estimated figure based on the respondents' perspective and the 498,958,721,320 CFA francs calculated using the CIPESA Framework, there is little doubt about significant financial losses as a result of the Internet shutdown.

IX.
Mind chats

During the desk review and administration of the questionnaires, the following testimonies were captured:

1.

"In Cameroon, we don't worry about [Internet] surveillance or privacy. We worry about how we can get access to the Internet." Al Banda of ActivSpaces Cameroon, a tech hub that runs centers aimed at providing resources to technology startups. They run two programs: an incubation program and an acceleration program.

2.

"I urge the entire nation to resolutely mobilize and support the numerous initiatives undertaken by our youths in this area. It is through such collective commitment that we will be able to rise to the challenge of the digital transition." Extract President Paul Biya, President of the Republic of Cameroon's speech during the 50th Edition of the Youth Day, hailing the Cameroonian youths as the "Android generation" and Cameroon's rising digital economy.

3.

"… but while the Anglophone regions remain offline, this vision of a united and prosperous future is in jeopardy. "This is unfortunately not a surprise as two neighboring countries—Chad and Gabon—both resorted to this radical solution to suppress opposition during elections." Julie Owono, head of the Africa desk at Internet Sans Frontières.

4.

"[The ban] has affected us very badly. We have emptied offices all over the city. All tech companies are down. Most banks are down, and ATM machines are not working, so people don't have access to cash. People have taken the last seven years to build the Silicon Mountain community with bare hands and no government support, but the government's move is about to crush all that. It is so frustrating." "Silicon Mountain is now in a coma state… Eight start-ups that were part of their community partnership have been affected, even though they paid rent for office space and made a one-year payment for the Internet connection to the government-owned CAMTEL, which also controls and cuts the Internet. We've taken the time to build this vibrant community …the government's taking away of the Internet … is devastating." Otto Akama, community manager of Activspaces, a tech hub and incubator that serves many of the city's young entrepreneurs in Buea (Cameroon's Interview conducted on CNN, January 2018).

5.

ActivSpaces has invited tech founders, leaving Buea to work out of its office space in Douala, the country's largest city and its commercial capital. But because of the costs involved in traveling the over 70-kilometer distance between Douala and Buea and the challenge in finding affordable accommodation, not all start-ups are able to move with their entire teams, said Akama in an article published by Abdi Latif Dahir in Quartz Africa, February 2017.

6.

"Unable to get news about the health of my mother, unable to send money for her medication, unable to send an important job link to my brother, unable to get a bank statement from my bank, unable to continue to send money for the construction of my house thus my workers have not been paid. The Internet cut in the northwest region has had a very negative impact on students' research, considering that the northwest region is home to several universities and institutions of higher learning in Cameroon." Dr. Ndi Richard T, Peace and Conflict Resolution Specialist, now based in the United States.

7.

"I have to drive for hours to access the Internet in the neighboring regions—fuel costs, car wear off, time loss," Anonymous respondent, Buea, Cameroon.

8.

"We receive daily reports from people who cannot receive money from abroad. There are transactions that are blocked, customer orders that cannot go through with money transfer agencies closed ... and if money does not get transferred, someone has to pay charges incurred," says Julie Owono, head of the Africa desk at Internet Sans Frontières.

9.

"We had already been suspecting it. So when I couldn't access WhatsApp, I knew La Republique [du Cameroun] had done it again. But they are not smarter than us." A Limbe-based activist who requested anonymity for security reasons indicated that he had installed a VPN to bypass the blocked apps.

10.

"It is ridiculous given that Cameroon has ratified international conventions and optional protocols that promote the Internet as a human right in much the same way as water, electricity, and education." Gwain Colbert Fulai, a civil society activist in the city of Bamenda.

11.

"The increasing sophistication of Internet shutdowns to target smaller groups of people and locations" besides the deployment of technologies "that don't truly provide new users with access to the full, open Internet." Deji Olukotun, the senior global advocacy manager with Access Now, 2017, in Quartz Africa.

12.

"The increasing sophistication of Internet shutdowns to target smaller groups of people and locations" besides the deployment of technologies "that don't truly provide new users with access to the full, open Internet." Deji Olukotun, the senior global advocacy manager with Access Now, 2017, in Quartz Africa.

13.

"To us, it is a sign that the government has no regards for our business, which directly contradicts its policies on youth development and professionalism; no right government does such a thing in the 21st century," says Kenneth Ngah, who established LCM Tours—a Web platform that connects tourists to travel agencies and tour guides in Cameroon.

14.

Felata says they have had to move around physically between Douala and Buea to deliver content. "Every other day, somebody has to go back [to Buea] and meet the rest of the team." This, he added, has incurred transportation costs of more than US$1,000. Felata says that if the shutdown keeps on going, they might have to move toward a less optimal business model or even "let go of the team in Buea." Mohamed Felata is the founder of VIVA, a pioneer company that provides entertainment services inside Cameroon's bus and train networks. Users can access VIVA content through smartphones, tablets, or the screens installed inside buses. This information was published in an article by Abdi Latif Dahir in Quartz Africa (February 2017).

15.

"The long-term consequences of this inactivity will be a collective loss of human capital, leading to a shortage of skills in Cameroon." A report in a French-language daily, "Le Quotidien de l'Economie."

X.

Conclusion and recommendations for the improvement of Internet access in Cameroon

Although no serious socioeconomic study has been published on the impact of the Internet shutdown in North West and South West English Speaking regions of Cameroon for several months after the crisis, this study, a desk review, focused on the examination of the antecedent issues surrounding Cameroon's telecommunications and ICT landscape. It also probed the socioeconomic impact of the Internet shutdown by using a well-established framework for calculating the economic impact in monetary terms and analyzing data collected from interactions with a cross-section of stakeholders in the two regions currently experiencing shutdown. It was observed that the shutdown affected a cross-section of all the sectors of the local economy and directly or indirectly had an impact on the entire population of these two regions and the nation as a whole.

During this research, several observations were made that form the basis for the following recommendations to Cameroonians for improving access to the Internet:

1.

A significant number of Cameroonians do not understand that access to the Internet is a basic right and thus shutting down the Internet is an outright violation of Cameroonians' constitutional right to freedom of expression and access to information. Generally, civil society in Cameroon has not been very successful in combating government decisions that are contrary to international best practice. The many consumer protection associations (25, according to TRB) have not made a statement concerning the ongoing Internet shutdown in Cameroon. Although civil society groups have taken several actions, more coordination of such actions is needed to achieve a unified voice that presses for the repeal of such unhelpful decisions. There is also a need for training and capacity-building events to advance community knowledge of the position and role of the Internet. Thus, capacity building and empowerment of civil society organizations on the issue of Internet access and affordability are crucial indicators of consumer protection in Cameroon.

2.

Internet cost of connectivity and bandwidth is one of the major impediments to the penetration and usage of this tool. The government and the numerous stakeholders involved in the sector need to re-examine the issue of affordability in Cameroon to reduce Internet cost and increase accessibility.

3.

Significant investments have been made to expand Cameroon's infrastructure and operator networks, and these need to be translated into improved QoS for consumers.

Statistics for the ICT sector (from both national institutions and international bodies) are contradictory, which explains why meaningful decisions pertaining to the sector cannot be taken with confidence. The National Institute of Statistics needs to play a leading role in the production and dissemination of more detailed, accurate, and regular data for the ICT sector.

XI.
References

Carolina Dominguez-Torres and Vivien Foster, 2011 Cameroon's Infrastructure: A Continental Perspective, The International Bank for Reconstruction and Development/ The World Bank Report, www.worldbank.org

CRTV 2018, Major announcements in the head of states message to the nation, http://www.crtv.cm/2018/01/major-announcements-in-the-head-of-states-message-to-the-nation/

World Statistics, "Republique du Cameroun – Statistics", http://www.statistiquesmondiales.com/cameroun.htm, Visited in October 2014.

World Bank, "Cameroon-Data", http://data.worldbank.org/country/cameroon, Visited in October 2014.

Cameroon-Info.Net 2018, Une plainte contre le Cameroun pour coupure de la connexion Internet dans le Nord-Ouest et le Sud-Ouest, http://www.cameroon-info.net/article/une-plainte-contre-le-cameroun-pour-coupure-de-la-connexion-Internet-dans-le-nord-ouest-et-314817.html

Ebongue J L 2015 Rethinking Network Connectivity in Rural Communities in Cameroon, University of Ngaoundéré, Ngaoundéré, Cameroon

Doing Business in Cameroon, No 51 may 2017 www.businessincameroon.com

CIPESA 2016, A framework for calculating the economic impact of Internet disruption in Sub Saharan Africa, www.cipesa.org

CRTV 2016, Ministry of Pubic Contracts: Public Contract System goes Digital in Cameroon, http://www.crtv.cm/2018/01/ministry-of-public-contracts-public-contract-system-goes-digital-in-cameroon/,accessed 26/01/2018

Dutta S., Baller, S., and Lanvin, B. (2016) The Global Information Technology Report 2015

ICTs for Inclusive Growth: http://www3.weforum.org/docs/GITR2016/WEF_GITR_Full_Report.pdf accessed 25/01/2018

INTERNET PENETRATION IN CAMEROON, https://www.statista.com/statistics/640127/cameroon-Internet-penetration/

Measuring the Information Society, 2013 by ITU http://www.itu.int/en/ITU-D/Statistics/Documents/publications/mis2013/MIS2013_without_Annex_4.pdf

Budde Comm, Cameroon – Telecoms, Mobile and Broadband – Market Insights, Statistics and Forecasts (2014), http://www.budde.com.au/Research/Cameroon-Telecoms-Mobile-and-Broadband-Market-Insights-Statistics-and-Forecasts.html

Inside Mobile Africa, a study by M&C Saatchi Mobile http://www.mcsaatchimobile.com/wp-content/uploads/2013/06/Inside-Mobile- Africa.pdf

Internet Going Mobile : Internet Access and Usage in Eleven African Countries http://www.researchictafrica.net/presentations/Presentations/2012%20Calandro%20Stork%20Gillwald%20-%20Internet%20Going%20Mobile-%20Internet%20access%20and%20usage%20in%20eleven%20African%20countries%20.pdf

Internet Live Stats 2017, http://www.Internetlivestats.com/Internet-users-by-country/

International Telecommunication Union, ICT Facts and Figures 2017

MINPOSTEL 2017, Major Projects https://www.minpostel.gov.cm/index.php/en/les-grands-chantiers/292-broadband-infrastructure-for-a-digital-cameroon-by-2020, accessed 2017

Olivier Nana, O and Tankeu, R 2012 Understanding what is happening in ICT in Cameroon; A supply- and demandside analysis of the ICT sector, in Evidence for ICT Policy Action Policy Paper 2, 2012

National Agency for Information Communication Technology (NAICT) (2007), National Policy for the Development of Information Communication Technology, [Online] Available from: http://www.ist-africa.org/home/files/Cameroon_NationalICTPolicy_2008.pdf, [Accessed 28th May 2014]

InfoDev (2007) Survey of ICt and Education in Africa : Cameroon Country Report 46407 ICT in Education in Cameroon [Online] Available from: https://openknowledge.worldbank.org/bitstream/handle/10986/10681/464070BRI0Box31on010ICTed0Survey111.txt?sequence=2. [Accessed 28th May 2014]

Law nº2010/013 English version http://www.art.cm:81/images/doc/lce%20version%20anglaise.pdf

Law nº2011/012 Framework on Consumer Protection http://www.digitcamlaws.net/GICAM/Law_framework_on_consumer_protection_in_Cameroon.pdf

Cameroon's Anglophone Crisis at Crossroads, https://www.crisisgroup.org/africa/central-africa/cameroon/250-cameroons-anglophone-crisis-crossroads, ICG Report 250 / Africa 2 August 2017

Atsa, in The Electronic Journal of Information Systems in Developing Countries, EJISDC (2016) 76, 7, 1-24

CC_PRC (2016), The Time for Investors: Digital Economy, Civil Cabinet, Presidency of the republic of Cameroon, http://www.conferenceinvestiraucameroun.com/confcameroun-content/uploads/2015/06/Letempsdes-investisseurs_Economie-Num%C3%A9rique.pdf

P.R.C (2016) Digital economy: A great gift of the Head of State to students, Republic of Cameroon, Presidency of the Republic. https://www.prc.cm/en/news/1870-digitaleconomy-a-great-gift-of-the-head-of-state-to-students

Republic of Cameroon, The Sector Strategy for Telecommunications and ICT (2005 - 2015) https://www.researchictafrica.net/countries/cameroon/Sector_Strategy_for_Telecommunications_and_ICT_2005-2015.pdf

Abdi Latif Dahir 2017, Guide to staying online if the Internet or social media gets blocked in your country

https://qz.com/902291/cameroons-silicon-mountain-is-suffering-losses-from-the-countrys-Internet-shutdown/


Internews