The impact of digitalization on poverty alleviation in Africa

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19 October 2021

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"*What is digital banking?* [2]

Abstract: Digitalization in Sub-Saharan Africa enhanced the accessibility of communications by the majority of the poor who had been excluded among others from social media, independent information channels, mobile banking and e-commerce. The creation of new economic opportunities, e.g. the pay-as-you-go business, and increased flow of information also boosted people's self-esteem, sense of belonging and citizenship. The smartphone became the main source of internet access which also bridged the divide between urban and rural communities. Thus, mobile telecommunications contributed positively to economic growth even in less developed regions, and there is still ample space for further improvement. Yet, Africans were also confronted with new forms of the digital divide between the poor and the rich, between advanced and less advanced African countries, as well as between Africa and the rest of the world. Moreover, the digitalization of the public sphere became a double-edged sword. Autocratic governments like Sudan and Togo shut down the internet during elections to facilitate the rigging of the polls. The lack of transparency and objectivity fuelled fake news which rapidly spread in social media, notably in times of the Corona crisis. Last, but not least, not everybody surfing on the internet had the same access to quality information. For example, disinformation was supported clandestinely by foreign powers to destabilize political regimes, or spy software was provided to governments to control the opposition. Both false news in social media and spy software impeded poverty relief in Africa significantly.

Keywords: Digitalization, Sub-Sahara Africa, digital inclusion, poverty alleviation, pro-poor growth, transparency, social media, fake news

JEL-Code: D31, D63, D83, E26, F35, F54, F63, G21, N37, O17, O33, O55, Q48, Z13

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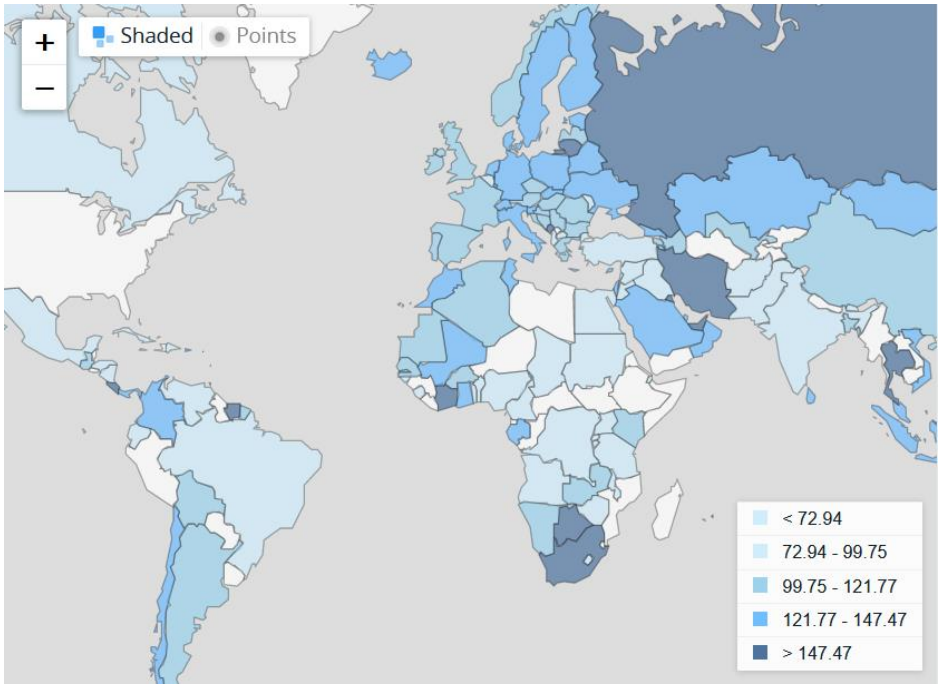
[2] Cartoon by Ras Manyanga, published in: Muhangi, Moses N. (2017): The new vision - Commercial banks should slow down the pace of digitalisation so as not to lock people who are not digital sawy. *Facebook*, 8 November 2017

(1) Introduction: Development of digitalization in SSA

New information and communication technologies (ICT) have changed lives significantly all over the world by providing new ways of communication, paying, selling, studying etc. This holds also for Sub-Saharan Africa (SSA). The rapid spread of mobile phones in large parts of Africa since the 2000s also opened access to the internet. It herewith contributed to bridging the divide between urban and rural Africa just as between the rich and the poor (Sedkaoui-2014; De Bruijn, 2019).

Mobile subscriber penetration in SSA increased to 44 % or 456 million in 2018, an increase of 20 million over the previous year. Moreover, about 239 million, i.e. 23 % of the population, also used the mobile internet regularly. Accordingly, SSA remained worldwide the fastest growing region (GSMA-2019).

Map 1: Mobile cellular subscriptions (per 100 people) - Sub-Saharan Africa (2020)



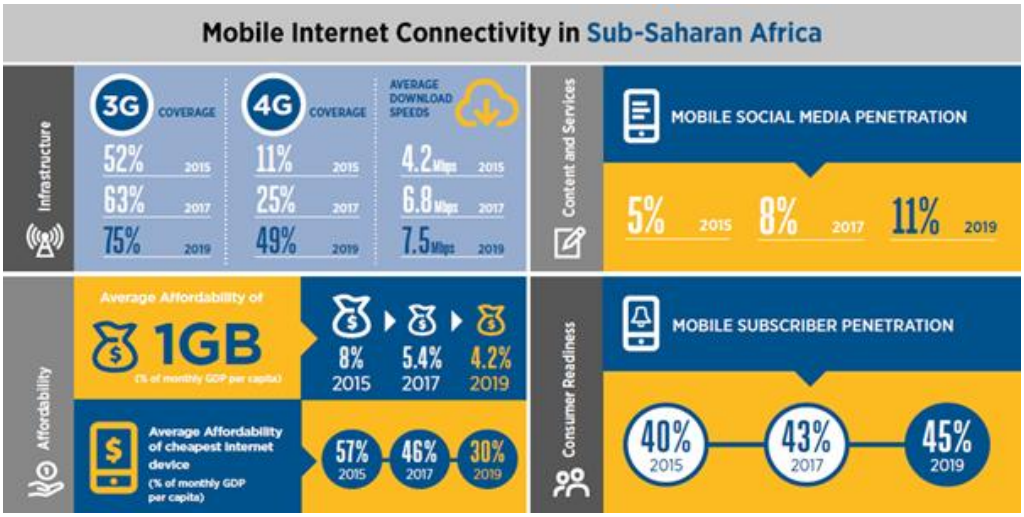
Source: International Telecommunication Union (ITU) (World Bank)

Even in small and remote LDCs, like West African Togo, the mobile phone user penetration rate soared by 700% in five years from 2013 to 2018, with about 80% of the population using a mobile phone in 2018 (Kohnert, 2021, BTI-Togo, 2022). Internet access improved with 17% of the Togolese population with regular access to the internet in December 2017, compared to 2.4 % of the population in 2008. In January 2020, 1.71 million Togolese were connected to the internet, an increase of 7.8 % compared with 2019. The overall internet penetration rate was now 21 %, including 43.1 % via mobile, 56.1% by computer, 0.7% by tablet. 650,000 subscribers were active on social networks (+ 14 % between April 2019 and January 2020). 580,000 users regularly accessed *Facebook* (95.9 % by mobile), 72,000 to *Instagram*, 170,000 to *LinkedIn* (republicoftogo.com, 19.02.2020). Three major *Instagram* macro-influencers in Togo had an average of 81 860 followers. The total reach of all Togolese *Instagram* macro-influencers combined was 245 581 followers (Hypetrace.com, 2020). *TikTok* is said to be

used increasingly by Togo's teenagers too. Influencers like the comedian influencer *#Roland_Tikena* allegedly counted more than 12 Mio. views.

Therefore, all over Africa, digitalization was heralded as a glorious 'digital revolution', or *Third Industrial Revolution*, providing for unimagined economic opportunities, enhanced flow of information and inspiring people's definition of self-awareness, belonging and citizenship (De Bruijn, 2019). It changed the way people and nations interacted, to create a 'new civilization' In this sense, ICT was considered essential to reach Africa's Millennium Development Goals (MDGs) (Sedkaoui, 2014).

Graph 1: Mobile internet connectivity in SSA (2020)



Source: Wyrzykowski, Robert (2020)

Yet, there is an additional demographical challenge that has to be confronted. West African urban centres for example will double their population by 2050. Even if sustainable economic growth could be established, governments would have to ensure that it is inclusive and the population does not fall into a poverty trap. Yet, whether even the most disadvantaged, can reap the benefits of the 'digital revolution' will depend on their access to digital infrastructure and the human skills to operate them. Moreover, sustainable development depends on an efficient implementation ecosystem, notably in the cities with their considerable socio-environmental and socio-economic challenges (Chenal, 2021).

In Sub-Saharan Africa, 3G coverage expanded to 75 % compared to 63 % in 2017, while 4G doubled to nearly 50 % compared to 2017. In 2019, mobile broadband (3G and 4G) connections outnumbered for the first time 2G connections in SSA (Wyrzykowski, 2020). The coverage gap halved from 50 % in 2014 to 25 % in 2019. Nevertheless, the SSA coverage gap remained the highest globally. The region included 67 % of the world's population that were not covered by mobile broadband. Economic and technical problems complicated the reduction of this gap. First, because the disposition of new sites in sparsely populated and remote rural areas could cost up to twice as much and could be three times more expensive to run (Wyrzykowski, 2020).

Despite the bottlenecks in mobile broadband and internet use its significance also for politics increased rapidly. Thus, social media networks like *Twitter* and *Instagram* were increasingly used both by the government and the opposition. This blessing, however, proved to be

ambivalent, notably in the case of authoritarian regimes like Togo. Accordingly, Lomé repeatedly blocked access during presidential elections, apparently to rig the polls, including temporary blocks on mobile phones and internet service, to prevent social networking. Besides, Lomé used highly sophisticated software, like the infamous Israeli logiciel '*Pegasus'* to target Catholic clerics and Civil Society militants to spy on mobile phones and internet traffic of the opposition. Officially, the software had been sold to the government in Lomé to fight terrorism and serious crime. Last, but not least, human rights organizations urged the Togolese government, which is based on a small elite from a minority ethnic group, the Kabyé, for seven decades, to refrain from inciting ethnic hatred in the media and social networks.

Thus, digital spaces have become increasingly important for organizing political uprisings and opposition movements all over Africa. Several regimes shut down the internet or blocked social media apps. Although web disruptions increased globally, African countries were dominating shutdowns in 2019. For example, they restricted social media platforms like *WhatsApp* and *Telegram* and disabled SMS text messaging. In 2019, Ethiopia, Sudan, DR Congo, and Chad were among the countries that entered the year totally or partially offline. Later on, they were joined by similar autocratic regimes in Algeria, Benin, Eritrea, Mauritania, Liberia, and Somalia (Dahir, 2019; Garbe, 2020).

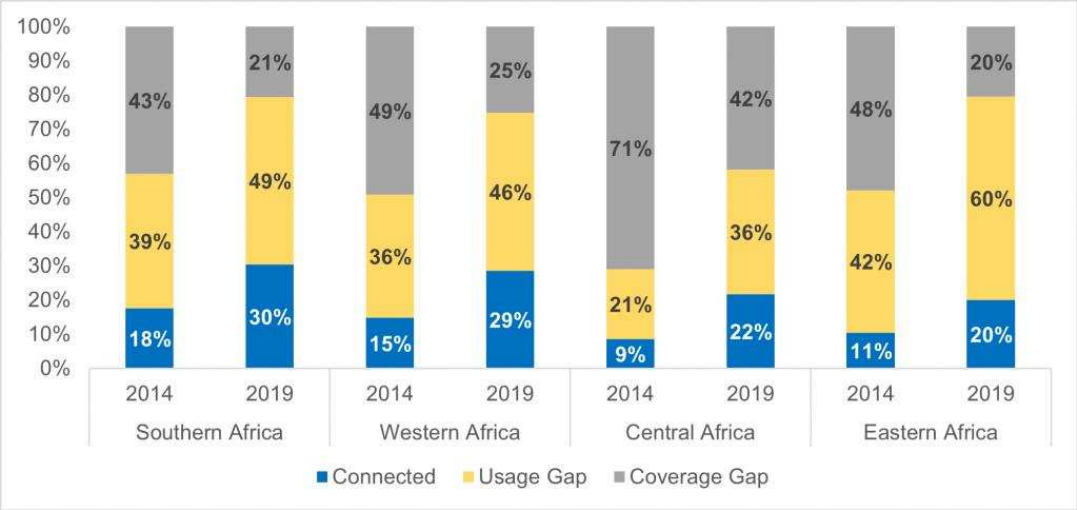
In addition, governments turned to digital surveillance technology as a shrewder way to crush opposition, thereby sidestepping economic costs and global criticism that these online shutdowns might encounter. The despotic regime in Lomé, quoted above, apparently was no exception. The University of Toronto's Citizen Lab, which investigates information controls, like digital espionage against civil society, revealed in a recent report titled "*Running in Circles: Uncovering the Clients of Cyberespionage Firm Circles*", how the government in at least seven other African countries, i.e. Botswana, Equatorial Guinea, Kenya, Morocco, Nigeria, Zambia and Zimbabwe, were using surveillance technology developed by Israeli telecom company *Circles* to spy on the personal communications of opposition politicians, human rights activists and journalists. These seven African countries were among 25 around the world using *Circles*, which was closely affiliated with the notorious NSO Group whose invasive Pegasus spyware was used to target human rights activists, key figures of the opposition and journalists worldwide (Dadoo, 2021).

(2) The impact of digitalization on poverty-alleviation in SSA

Despite remarkable improvements in mobile broadband coverage, the usage of mobile internet gap increased from 36% in 2014 to 49 % in 2019, as mobile usage does not grow as fast in the newly covered areas as network deployment. This challenge was especially pronounced at the SSA sub-regional level. Central Africa, for example, which lacked behind in its infrastructure development in general, had the highest coverage gap with 42 % in 2019, whereas the user gab was most pronounced in Eastern Africa (60 %), followed by Southern Africa (49%). Kenya, the Ivory Coast, Sierra Leone and Zambia counted among those who improved mobile internet penetration most between 2014 and 2019. The best enablers, e.g. concerning affordability, were Mauritius, Nigeria, Botswana, South Africa and Ghana (Wyrzykowski, 2020). Unsurprisingly, these countries were also among the 15 best SSA performers in GDP per capita, i.e. Mauritius (2), Botswana (4), South Africa (6), Ghana (11) and Nigeria (14) according to the ranking provided by the World Bank for 2020.

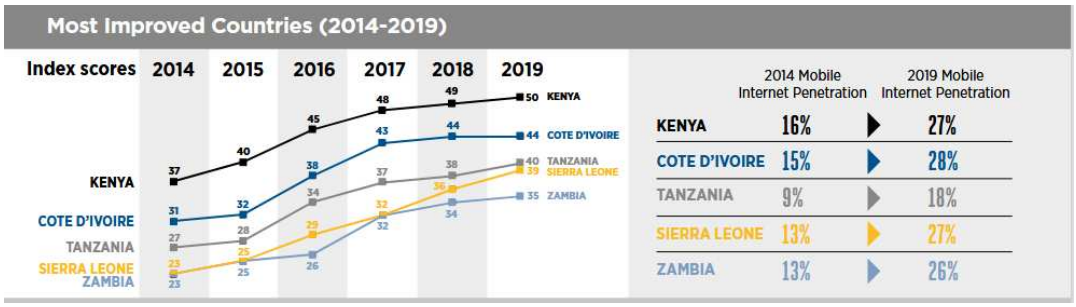
The gap in mobile internet use disproportionately affected the rural population, women and the poor. The large gender- and the rural-urban gap in mobile internet use in SSA, standing at 37 % and 60 % respectively, was much higher than the average of low- and middle-income countries (LMICs). Both, the gender and rural-urban gaps do not yet show any signs of narrowing (Wyrzykowski, 2020). Key barriers for enhanced adoption of mobile internet were the lack of awareness (25 % of adults) and the lack of literacy and digital skills, followed by affordability and perceived relevance.

Graph 2: Coverage and usage gaps of mobile internet in SSA



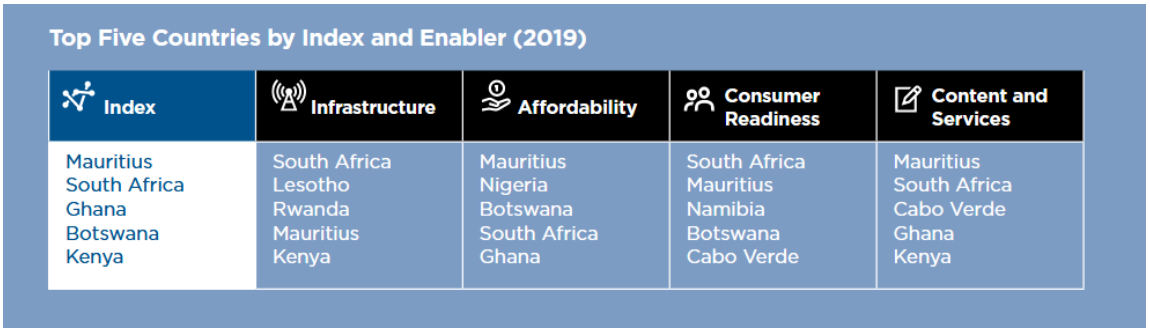
Source: Wyrzykowski, Robert (2020)

Graph 3: Most improved SSA countries (2014-2019)



Source: Wyrzykowski, Robert (2020)
GSMA Mobile Internet Connectivity 2020 - Sub-Saharan Africa Factsheet

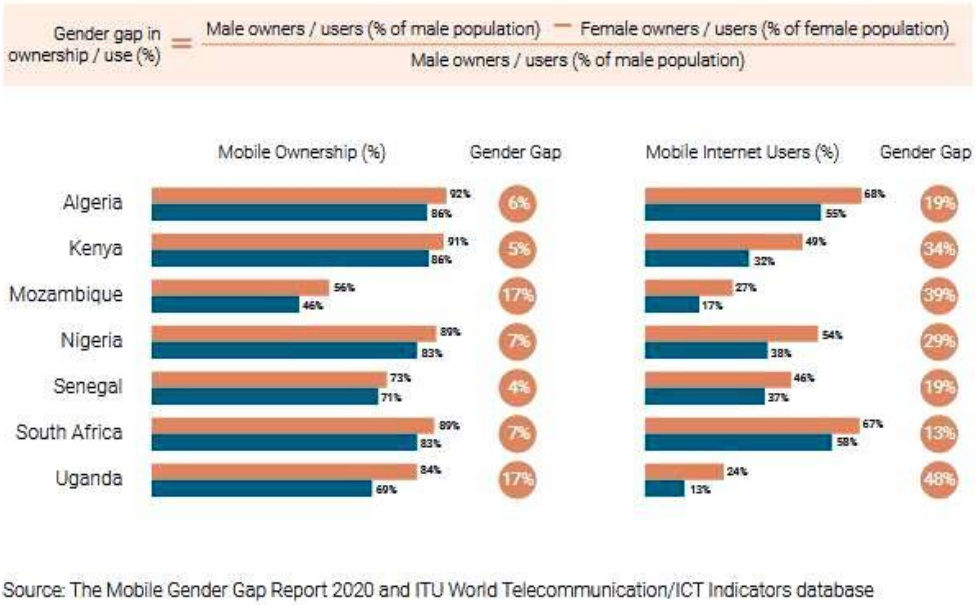
Graph 4: Top five SSA countries of mobile internet use by index and enabler (2019)



Source: Wyrzykowski, Robert (2020) GSMA Mobile Internet Connectivity 2020 - SSA Factsheet

The digital divide concerning gender was considerable all over SSA. Its different dimensions reinforced each other, which indicates the problems of bridging this divide. Recent empirical studies in Kenya, Nigeria and South Africa revealed that it existed across all levels of analysis (Mulrean, 2020). In general, high mobile phone ownership but low Internet use were typical among Kenyan and Nigerian women as well as among female black mobile owners in South Africa. However, Kenya has the highest mobile penetration rate among women. Nevertheless, cell phones remained unaffordable to the many Kenyans living in extreme poverty. Even in Nigeria with its very low-price internet access, half of the Nigerian women living in extreme poverty were still unable to pay, because they had to prioritize necessary expenses for food, shelter and children's education. The gender divide existed mainly because many women were unaware that they could access the Internet on their mobiles. Women in rural areas in all countries were disadvantaged additionally because of the uneven regional mobile network coverage (Mulrean, 2020).

Graph 5: Digital gender gap, SSA, selected countries, 2019



Source: FAO, 2021

The COVID-19 pandemic widened the digital divide for rural women in SSA even more (Jones, 2021). Shortly after the Corona related lockdowns began, the daily app downloads in the financial technology (fintech) category jumped by about 30 % worldwide, above their pre-lockdown baseline, with Africa also observing a substantial increase in this regard (Jones, 2021).

Digitalization impacted also significantly on the creation and maintenance of human relations and social institutions. Notably in urban centres and densely populated areas, it influenced the way of people who used and continued to appropriate it, who invented it and thereby reinvent themselves, thus creating a novel, modern 'urban society' based on digital technology (Akindès & Kouamé Yao, 2019).

Digital practices, now and again appeared in new and unexpected guises. Apart from examples like mobile banking and internet use even by the poor and its multiple uses mentioned above, they conquered new realms like the informal sector. For example, they contributed to the modernisation of urban transport systems through the digitalisation of

transactions. Also, digitalization enabled the use of social networks to reinvent funerary social structures in times of the Corona pandemic, etc. It even contributed to facilitating access to electricity and clean cooking in Sub-Saharan Africa by *pay-as-you-go* business models in the off-grid solar sector (Mazzoni, 2018).

Certainly, digitalization improved accessibility of communications, which before had been impeded by poor infrastructure, thereby allowing the poor majority to participate, e.g. in mobile banking and small and medium enterprises (SMEs) in e-commerce. However, on the other hand, SSA countries could also face premature de-industrialization and other negative externalities under adverse economic conditions due to the effects of digitalization (Myovella et al 2020).

Thus, the 'digital revolution' introduced innovative ways of experiencing the city and living in the city. However, despite the widespread adoption of mobile phones, the use of digital technology created already fault lines and inequalities between categories of users. Different lifestyles of users, according to income category, for example, represented not only new social practices encoded in the changing nature of urban citizenship. The new digital culture infiltrated various dimensions of social life. This concerned not only mobile banking and internet use, but also transport practices, small-scale trade, and modes of access to food, especially in times of the Corona pandemic (Akindès & Kouamé Yao, 2019).

A new strategy of 'digital inclusion' provided communication packages specially designed for the perceived opportunities of socio-economic niche markets, including offers for low-income groups corresponding to their unstable incomes and their specific needs. For example, 'social connection passes' or low-cost communication packages were offered, covering the hours of low network use in the morning or late in the evening. At the same time, this contributed to heavier use of the network, an increased number of users online and a better degree of capacity utilization, with the majority connecting during the time slots determined by their service packages. Examples of these packages included so-called 'friends and family' numbers, and 'social connection passes' or low-cost communication packages covering the hours of low network use, generally early in the morning or late in the evening. Thereby they provided access to digital social networks, messaging via *WhatsApp*, *Skype*, etc. at a low cost making it affordable for the poor. Moreover, the policies of 'digital inclusion' could generate value from local knowledge and competence not only in the so-called 'poor' countries of Africa South of the Sahara but also concerning the African poor themselves. All this significantly contributed to the evolution of social interactions in terms of the duration of mobile communication, which was crucial under African conditions, dominated by the culture of orality (Akindès & Kouamé Yao, 2019).

Besides, ethical perspectives like questions of power relations, post-colonialism and (gender) equality should be considered as well (Schelenz & Schopp, 2018). Behind each form of appropriation there hide inequalities and differences in practices according to social class. They could be an indicator for socio-economic differentiation by 'modernization' and thus opened up new fields of study for the sociology of class-based practices (Akindès & Kouamé Yao, 2019). Last, but not least, this could also be used to map out valuable proposals to promote inclusive economic growth, notably in African cities. Besides, digitalization could deter corruption, at least concerning the perception of corruption, and increase trust in tax officials. Yet, the dampening effect of digitalization on corruption was thwarted in countries where the government used to shut down the Internet (Ouedraogo & Sy, 2020).

Yet, the Janus face of digitalization should not be disregarded as well. In fact, improved digital access showed to be a double-edged sword. In 2019, at least six governments in Africa, including Sudan, DR Congo and Togo, shut down the internet for political reasons, often with the complicity of western providers. Also, the Tanzanian government tried to tax bloggers out of existence by imposing exorbitant fees, and the government in Kampala (Uganda) exerted a daily tax on the use of social media as *Facebook*, *Twitter* and *WhatsApp* (Pilling, 2019).

Even governments showed to be vulnerable. Many African countries became almost wholly reliant on Chinese companies, including *Huawei* and *Transsion*, a Shenzhen-based mobile phone provider that sold more phones in Africa than any other company. The latter even begun manufacturing in Ethiopia. But certain Chinese companies, including ZTE and Hikvision, provided at the same time the surveillance technology for autocratic African governments to monitor and spy on their population (Pilling, 2019). *CloudWalk Technology*, a Guangzhou start-up, even signed a deal with the government in Harare (Zimbabwe) to provide a mass facial recognition programme that will send data on millions of Zimbabwean citizens, captured by CCTV cameras, to the Chinese company, which still tried to improve technology to distinguish between African's black faces (Pilling, 2019).

However, the digitalization of social media was also responsible for the rapid spread of fake news and disinformation, notably under the restrictions to prevent the spread of the COVID-19 pandemic. Government distrust, lockdown, and increased social media access accelerated for example the spread of misinformation and disinformation in DR Congo (Cirhigiri, 2020).

(3) Country case studies

The following country case studies focus on Western Africa which had in 2019 a relatively high rate of connected users (29 %), compared with Eastern Africa (20 %) and Central Africa (22 %). Only Southern Africa, dominated by South Africa, which counted already among the 'Newly Industrialized-' or Middle-Income Countries (MICs) and therefore were not typically for SSA's LDCs, performed slightly better (s. Graph 2, above).

The best West African performers, as indicated by the GSMA *mobile connectivity index 2019*, were Ghana (52%), Nigeria (49%), and Ivory Coast (44%), followed by Senegal (41%), Benin and Sierra Leone (both about 39%). Niger (18%) and Guinea-Bissau (24%) were at the lower end (GSMA Mobile Connectivity Index, 2019, countries).

The *affordability* of mobile connectivity [3] was best in Nigeria (55%), Ghana and Mali (both 48%), Guinea (Conakry) (47%), Burkina Faso (44%), Cote d'Ivoire (42%) (see Appendix for more details).

[3] Measured as "the availability of mobile services and devices at price points that reflect the level of income across a national population" (including indicators like 'mobile tariffs', 'handset price', 'inequality' and 'taxation'), see Mobile Connectivity Index Methodology – GSMA, 2021.

1) Côte d'Ivoire

Graph 6: Mobile connectivity index, Côte d'Ivoire, 2019

Source: GSMA Mobile Connectivity Index, Côte d'Ivoire, Oct. 2021

Digitalization in Côte d'Ivoire (Ivory Coast), as elsewhere in SSA, was based on the development of the mobile telephony sector. The latter evolved in two distinctive waves which corresponded largely with economic growth and the recession because of socio-political turmoil and the Ivorian civil war respectively, i.e. 1997-2012 and 2012-2019 (Capri, 2020). Although the Ivory Coast was a latecomer, compared with other SSA countries, it, later on, ranked high in the mobile connectivity index (rang 3 of 14 West African countries, see Appendix). Meanwhile, the mobile phone was fully integrated into Ivorian society mainly due to two factors: First, the government in the capital Yamoussoukro (*de jure*; *de facto* Abidjan) liberalized the mobile sector by creating an enabling legislative, juridical and regulatory institutional framework for private investors. Secondly, it promoted relatively early the second generation cellular telephony standard (Global System for Mobile Communications, GSM) that allowed for standardization of communication spaces. Thus, for example, one or more people connected to the same network could decide anytime to communicate or not. A central feature to facilitate this process was the mass distribution of cheap telephone recharge cards. Three major operators dominated the market: *Orange*, *MTN* and *Moov*, followed by five others: *Cora*, *Comium*, *GreenN*, *WARID CI* and *Café Mobile*. They operated mainly in the urban centres where it was most profitable, to the detriment of rural areas (Capri, 2020).

The development of the spatial digital network started in Abidjan and its suburbs continued in the coastal zone with much tourism and proceeded afterwards to the second economic centre of the country around Bouaké. Later on, the other regions were conquered one by one by implanting basic mobile-phone structures in major places, serving as a base to cover the surrounding localities (Capri, 2020).

The introduction of prepaid services allowed customers to act economically and to control their consumption without committing themselves to fixed monthly subscriptions. Moreover, needy potential users, who could not afford their own handsets, were offered loans. This led several small-scale entrepreneurs even in the countryside to invent a new kind of business, i.e. to rent phones from other villagers and to bill their customers for each call. Thus, an informal economy emerged with 'cellular cabins' at all major city crossroads. The uncontrolled multiplication of these 'cabins' in densely populated areas had an unwelcomed side-effect, i.e. the saturation of networks, notably between 7 pm and 9 pm, when most jobholders had returned home and started their private chats and/or mobile business (Capri, 2020). Also, in the development phase, the Ivorian civil wars (2002-2004 and 2010-2011) impaired the quality and growth of the cellular network, notably in the southern regions, because many users had fled the northern and western combat zones to reach the densely populated South where the technical infrastructure became overstrained (Capri, 2020).

By mid of the 2010s, the major cities and their surroundings had been covered. This, and the rapidly decreasing cost of the mobile phone service, allowed for a phenomenal increase in its use also for other purposes. Consequently, digitalization changed the consumption habits of users significantly. Its costs, therefore, constituted in many user households a prominent part of household expenditure, immediately after housing and food. They spend up to 15% of their disposable income on digital services (Capri, 2020).

The direct and indirect employment effects of the digital economy in the Ivory Coast were considerable as well. Jobs in the digital sector increased from 7,000 in 2007 to more than 17,000 jobs in 2016. Thus, more money was spend on ICT services (0.2 %) than on health (0.1 %) and education (0.1 %). The value added by the digital economy stood at F CFA 1,045 billion, or 5.2 % of real GDP in 2016, which generated taxes and duties of more than F CFA 252 billion, or overall 14 % of taxes collected in the country (Capri, 2020).

Finally, digitalization also transformed the delivery of services related to health, agriculture and education fundamentally. Online platforms allowed doctors and healthcare professionals to communicate directly with patients, even in the countryside, through voice calls and text messages. However, the changes brought about by the ICT sector were no panacea. The digital divide, mentioned above, implied also the risk of exclusion and the perverse effects of the misuse or malicious use of digitalization (Capri, 2020).

2) Ghana

Graph 7: Mobile connectivity index, Ghana, 2019

Source: GSMA Mobile Connectivity Index, Ghana, Oct. 2021

Digitalization became a national goal in Ghana because the government expected from it the urgently needed upswing (Jodin, 2020). Vice President Mahamudu Bawumia underscored that Ghana could only make the much-needed strides in development when digital technology became the driver for all sectors of the economy, especially in the administration of land (Bawumia, 2021). Ghana's digitalization grew rapidly thanks to early liberalization and deregulation since the late 1990s. It had a countrywide mobile coverage and a high mobile penetration rate of 131 SIM cards per 100 inhabitants, compared to an average of 80 in the rest of Africa (WB, 2019). As in other SSA countries, most urban centres advanced rapidly but the rural and remote areas were left behind. Moreover, even in the cities access to the Internet was limited and invaluable. The low-income strata in particular were excluded. During the COVID-19 pandemic, the lockdown often was a threat to their existence (Kohnert, 2021a).

No wonder then, that in Ghana emerged a vibrant IT sector with companies such as *mPedigree*, *Rancard*, *Softtribe*, *Hubtel*, *mPharma*, *Logiciel*, *Nosmay*. They were fiercely competing in software and applications platforms for everything from finance and payments to agriculture and medical services (WB, 2019). Government digitalization programs included sectors like the ports and harbours, national health insurance services, utility bill payments, financial services and digital addressing systems (Ayakwah, et al, 2021). Cornerstone projects included a comprehensive digital address system, essential for digital commerce. Ghana's National Identification project was Africa's largest digitization project. It involved implementing an identity management system to promote equal access to physical and digital services, social inclusion and economic development. Over 5,000 bundles of registration and

identification kits were distributed all over the country aiming to register more than 100,000 people per day in more than 2,000 registration centres. The kits were to include up to 14 applets, like a payment platform, driver's license, national health insurance and passport. They were explicitly meant also as a socio-economic inclusion project (Atea, 2021).

3) Togo

Graph 8: Mobile connectivity index, Togo, 2019

Source: GSMA Mobile Connectivity Index, Togo, Oct. 2021

Togo's mobile phone user penetration rate soared by 700 % in the five years from 2013 to 2018, with about 80 % of the population using a mobile phone in 2018. In January 2020, 1.71 million Togolese were connected to the internet according to a study published by '*Hootsuite and We Are Social*' on the use of the web and social networks in Togo. An increase of 7.8 % compared with 2019. Internet access was improving with 17 % of the population with regular access to the internet in December 2017, compared to 2.4 % of the population in 2008. The overall internet penetration rate in 2019 was 21 %, including 43.1 % via mobile, 56.1 % by computer, 0.7 % by tablet. 650,000 subscribers were active on social networks (+ 14 % between April 2019 and January 2020). 580,000 users regularly access *Facebook* (95.9 % by mobile), 72,000 to *Instagram*, 170,000 to *Linkedin* (republicoftogo.com, 19.02.2020). There were three *Instagram* macro-influencers in Togo with an average following of 81 860 followers. The total reach of all Togolese *Instagram* macro-influencers combined is 245 581 followers (Hypetrace.com, 2020). *TikTok* is said to be used increasingly by Togo's teenagers too. Influencers like the comedian influencer *#Roland_Tikena* allegedly count more than 12 Mio. views. *Twitter* and other social media networks are increasingly used both by the government and the opposition.

In February 2020, three new actors joined the "*Cizo*" project that had already successfully met the challenge of electrifying 40,000 households in neighbouring Benin in 2019. These are off-grid suppliers *Fenix International*, *Solergie* and *Moon*. A subsidiary of the French energy giant *Engie*, the Ugandan-based company *Fenix International* competed with *Solergie*, which operated in Togo under a partnership with French oil giant *Total*. The Belgian company offered a solution called *SolergieBox*. It is a mini-grid made up of solar panels, an inverter and a battery for storing electricity. This off-grid solar system can supply eight households in rural areas. Households connected to the mini-grid can pay their bills via "mobile money", a mobile phone payment system. The mobile phone was also a key piece of equipment in the service offered by *Moon*. This French company, which was also involved in the "*Cizo*" project, offered solar home kits. Its own was made up of solar panels, a storage system, and USB ports for recharging mobile phones. Unlike other suppliers of solar kits, its solution was accompanied by a smartphone (*Moonphone*) on which was installed an application that allowed the payment of the solar kit in small amounts (in pay-as-you-go) (Kohnert, 2021. BTI-Togo).

4. Conclusion

Digitalization of private and public services took an expressive speed in the past two decades in many countries of Sub-Sahara Africa. It became the fastest-growing region worldwide in this respect. Mobile subscriber penetration amounted to about 45 % in 2019, another 23 % of the population additionally used the mobile internet regularly. Nevertheless, a digital divide became increasingly problematic. It concerned not only the traditional urban-rural contrast with all its well-known ramifications, but – at least as important – the increasing gap between the rich and the poor. The people without access to mobile communication and the Internet were put at a disadvantage because they were unable, or to obtain only under difficult conditions, digital information, shop online, participate democratically, or learn and offer skills. Thus, the digital divide entangled sweeping ethical perspectives too. The burning questions of the age-old debate on the impact of colonialism on the "The Wretched of the Earth" (Franz Fanon) have to be resumed again and answered anew, including questions of power relations, post-colonialism and (gender) equality. Behind each form of digital appropriation there hide inequalities and differences in practices according to social class. Whether this constitutes an inevitable socio-economic differentiation owing to 'modernization' is open to question. In any case, governments would be well advised to go against it because otherwise they might be swept away by populist, mostly nationalist movements that menace over Africa anyway (Kohnert, 2009).

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Résumé : La numérisation en Afrique subsaharienne a amélioré l'accessibilité des communications par la majorité des pauvres qui avaient été exclus, entre autres, des médias sociaux, des canaux d'information indépendants, des services bancaires mobiles et du commerce électronique. La création de nouvelles opportunités économiques, par ex. l'activité par répartition et l'augmentation du flux d'informations, ont également renforcé l'estime de soi des personnes, leur sentiment d'appartenance et de citoyenneté. Le smartphone est devenu la principale source d'accès à Internet, ce qui a également permis de combler le fossé entre les communautés urbaines et rurales. Ainsi, les télécommunications mobiles ont contribué positivement à la croissance économique, même dans les régions les moins développées, et il y a apparemment encore amplement de place pour de nouvelles améliorations. Pourtant, les Africains ont également été confrontés à de nouvelles formes fossé digital entre les pauvres et les riches, entre les pays africains avancés et moins avancés, ainsi qu'entre l'Afrique et le reste du monde. De plus, la numérisation de la sphère publique est devenue une arme à double tranchant. Des gouvernements autocratiques, comme le Soudan et le Togo, ont fermé Internet pendant les élections pour faciliter le trucage des élections. De plus, le manque de transparence et d'objectivité a alimenté les fausses informations qui se sont rapidement propagées sur les réseaux sociaux, notamment en période de crise de COVID-19. Enfin, tout le monde qui navigue sur Internet n'a pas le même accès à des informations de qualité. La désinformation était soutenue clandestinement par des puissances étrangères pour déstabiliser les régimes politiques, ou des logiciels espions fournis aux gouvernements pour contrôler l'opposition. Les fausses nouvelles dans les médias sociaux et les logiciels espions ont entravé la pauvreté en Afrique de manière significative.

Zusammenfassung: Die Digitalisierung in Subsahara-Afrika verbesserte Kommunikations-Zugang für die Mehrheit der Armen, die bis dahin unter anderem von sozialen Medien, unabhängigen Informationskanälen, Mobile Banking und E-Commerce ausgeschlossen waren. Die Schaffung neuer wirtschaftlicher Möglichkeiten, z.B. das Umlageverfahren und der verstärkte Informationsfluss, stärkten auch das Selbstwertgefühl, das Zugehörigkeitsgefühl und das Nationalbewußtsein der Menschen. Das Smartphone wurde zur Hauptquelle des Internetzugangs, der auch die Kluft zwischen urbanen und ländlichen Gebieten überbrückte. Damit trug der Mobilfunk auch in weniger entwickelten Regionen positiv zum Wirtschaftswachstum bei, und es gibt offenbar noch viel Raum für weitere Verbesserungen. Afrikaner wurden aber auch mit neuen Formen der digitalen Kluft zwischen Arm und Reich, zwischen entwickelten und weniger entwickelten afrikanischen Ländern sowie zwischen Afrika und dem Rest der Welt konfrontiert. Zudem wurde die Digitalisierung der Öffentlichkeit zu einem zweischneidigen Schwert. Autokratische Regierungen wie der Sudan und Togo haben das Internet beispielsweise während der Wahlen abgeschaltet, um Wahlfälschung zu erleichtern. Zudem befeuerte der Mangel an Transparenz und Objektivität insbesondere in Zeiten der Corona-Krise fake news, die sich in den sozialen Medien rasant verbreiteten. Nicht zuletzt hatte nicht jeder, der im Internet surfte, den gleichen Zugang zu qualitativ hochwertigen Informationen. Desinformation wurde zudem oft heimlich von ausländischen Mächten unterstützt, um politische Regime zu destabilisieren, oder den Regierungen Spionagesoftware zur Verfügung gestellt, um die Opposition zu kontrollieren. Sowohl Desinformation in sozialen Medien als auch Spionagesoftware haben die Armutsbekämpfung in Afrika erheblich behindert.

Appendix :

Ranking of West African countries by GSMA Mobile Connectivity Index (2019)

(1) Ghana : 52.0

- Infrastructure: 49.1
- Affordability: 48.4
- Consumer Readiness: 59.5
- Content and Services: 51.8

(2) Nigeria : 49.1

- Infrastructure: 42.6
- Affordability: 55.0
- Consumer Readiness: 50.8
- Content and Services: 48.9

(3) Cote d'Ivoire: **44.0**

- Infrastructure: 49.2
- Affordability: 42.0
- Consumer Readiness: 45.7
- Content and Services: 39.6

(4) Senegal : 41.3

- Infrastructure: 49.7
- Affordability: 44.6
- Consumer Readiness: 43.7
- Content and Services: 30.1

(5) Benin : 39.1

- Infrastructure: 47.7
- Affordability: 33.6
- Consumer Readiness: 43.8
- Content and Services: 33.2

(6) Sierra Leone : 38.6

- Infrastructure: 33.3
- Affordability: 39.0
- Consumer Readiness: 42.3
- Content and Services: 40.3

(7) Togo : 35.9

- Infrastructure :38.4
- Affordability: 36.1
- Consumer Readiness: 45.1
- Content and Services: 26.5

(8) Liberia : 34.4

- Infrastructure: 35.6
- Affordability: 22.9

(9) Mali : 33.9

- Infrastructure: 39.0
- Affordability: 48.0
- Consumer Readiness: 32.1
- Content and Services: 22.0

(10) Burkina Faso : 32.4

- Infrastructure: 28.1
- Affordability: 44.4
- Consumer Readiness : 36.3
- Content and Services: 24.5

(11) Mauritania : 32.1

- Infrastructure: 24.5
- Affordability: 39.7
- Consumer Readiness: 42.8
- Content and Services: 25.4

(12) Guinea : 31.1

- Infrastructure: 26.9
- Affordability: 47.4
- Consumer Readiness: 38.3
- Content and Services: 19.3

(13) Guinea-Bissau : 24.4

- Infrastructure: 44.7
- Affordability: 15.8
- Consumer Readiness: 38.3
- Content and Services: 13.1

(14) Niger : 18.3

- Infrastructure: 12.7
- Affordability: 27.0
- Consumer Readiness: 20.8
- Content and Services: 15.6