



Cognitive Warfare: Report

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The Changing Information Space in Sub-Saharan Africa

Entertainment towards Destabilization:
The Beginnings of Online Cognitive Warfare

Presented jointly at the Global Engagement Center (US Department of State) & Ecole de Guerre (French Ministry of Armed Forces)

2022 - 2023

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Abstract

The evolution of digital technologies has been very rapid on the African continent, especially given that only one third of the population has access to the Internet and barely half have mobile coverage. Nevertheless, through comprehensive analysis of other relevant demographics, including a doubling of the African population by 2050, the authors demonstrate how Africa offers a particularly favorable soil for the development of both online entertainment and those social networks likely to become an "El Dorado" of social gathering. Like social networks, the evolution of video games and the metaverse into new spaces of exchange and messaging will quickly lead to their becoming a new space of disinformation in emerging cognitive warfare in Sub-Saharan Africa (SSA).

This cognitive warfare finds a new field of application in video games and the metaverse because of the potentialities offered by these immersive universes, the dizzying improvements in AI and the lack of regulation. Thanks to the universal and real-time understanding enabled by AI, video games and the immersive worlds of the metaverse will reach a crescendo and generate widespread misinformation in line with online cognitive warfare in SSA, rendering the human brain a new field of conflict.

In order to limit the expansion of disinformation in the context of this cognitive warfare, the authors detail several solutions to be developed through social networks, video games and future metaverses, including targeted research on related topics to help governments better deal with this threat, developing GAM-INT and using pre-bunking to prevent disinformation in SSA.

Foreword

This paper presents the research of two French officers studying at the *Ecole de guerre*.

To avoid any cultural miscommunications and for purposes of clarity, a few preliminary remarks and definitions are included here.

⇒ [Highlighted words](#) are defined in the glossary at the end of the paper.

⇒ A few points about Sub-Saharan Africa (see [attachment A](#)):



¹

- It consists of 48 countries².

- It has a particularly diverse cultural and linguistic landscape, with over 2,000 different languages spoken³.

- It should not be confused with Francophone Africa, which refers to all states or territories in Africa where the French language (alone or among other languages) is used in administration, business, media, culture and education.

⇒ The study of "online entertainment" will be limited here to social networks, games (mobile and video), chat rooms, and metaverses. It does not include real-time streaming platforms for music, podcasts, movies, and digital books.

⇒ [Cognitive warfare](#) should not be confused with the new forms of hybrid warfare such as cyber warfare, influence warfare, psychological warfare, or information warfare. It is a broader approach that encompasses them.

⇒ Identifying weak signals in this paper involved careful analysis of data, events, and trends using open-source intelligence ([OSINT](#)).

⇒ The weak signal methodology used to describe cognitive warfare in Sub-Saharan Africa combined quantitative and qualitative analysis. It followed these steps:

¹. Myles D Connor et al. "Burden of Stroke in Black Populations in Sub-Saharan Africa", *The Lancet Neurology*, vol. 6, no. 3, 2007, pp. 269-278, <https://www.thelancet.com>.

². "Focus: Sub-Saharan Africa", *World Bank* online, accessed February 25, 2023, <https://worldbank.org>.

³. "Les 10 langues africaines les plus parlées", *RFI* online, last modified May 30, 2017, <https://www.rfi.fr>.

1. **Identify relevant sources of information:** These may include news articles, academic research, blogs, social media posts, images, videos, podcasts, or other online sources. This list is not exhaustive, but it is important to cast as wide a net as possible to capture as much relevant information as possible.
 2. **Data Collection:** Once the relevant sources have been identified, as much data as possible should be collected from each source. This may include academic data as well as interviews and ethnographic work.
 3. **Data Analysis:** A variety of tools and techniques were used to analyze the data, including natural language processing, sentiment analysis, and thematic modeling. This included identifying patterns, trends, and potential indicators of emerging threats.
 4. **Proactivity and proposed solution(s):** Based on the information gathered, this involves taking a risk by proposing potential solution(s) that may include, for example, raising awareness or developing new policies and procedures.
- ⇒ The [metaverse](#): Touted as the next step in social connectivity, it is an emerging virtual reality space where users around the world can interact with each other and with fictional entities in environments generated entirely by computers.

Introduction

What is the link between these different images?



1



2



3



4

Beyond referencing the African continent, these images share another characteristic. If this characteristic is difficult to detect at first glance it is because these images are not what they pretend to be. They are simulacra. The first image is not a photograph taken to illustrate the condition of child soldiers; rather, it is taken from a video game⁴. The second image is not a child's illustration but a freeze frame from a propaganda video⁵. The third image features Shudu Gram⁶, one of the most famous African influencers on Instagram, who describes herself as "the World's First Digital Supermodel" yet she is not made of flesh and blood. The last photo⁷ showing body parts barely covered with sand, is indeed the Gossi mass grave allegedly attributed to France.

Another commonality and not the least significant: these pictures, in their original formats, have been widely disseminated on social networks. Websites, mobile applications and social networks that, since the advent of Web 2.0⁸, have allowed their users to virtually share different types of content and exchange information, pictures, and videos with different communities (such friends, family, professional acquaintances, and people with shared interests), continue to evolve. Indeed, this rapid evolution is such that the former executive chairman of Alphabet⁹, Eric Schmidt, predicts that the Internet will "disappear" in its current form. Even if it does not cease to exist, its evolution so integrate into our everyday lives and surrounds that its presence may not even be perceived¹⁰. Many threats and imminent dangers arise as a result of this integration. Today, with social networks and video games, but even more so tomorrow with their extension into virtual universes promised by the steady rise of various metaverses, such "perception modification" is and will continue to be very real.

Increasingly seen on a global scale, the problem of cognitive warfare in cyberspace is thus becoming a major concern. Cognitive warfare is a new type of conflict with a universal scope made possible by hyper-connectivity; yet it should not be confused with the new modes of hybrid warfare such as cyberwarfare, influence warfare, psychological warfare or information warfare. It is something else entirely based on the use of scientific knowledge developed through information and communication technologies (ICT) as well as [cognitive sciences](#).

⁴. Screenshot from the game *Metal Gear Solid V - The Phantom Pain*. In 2014, the news channel "Russia Today (RT)", in its English version, used it as part of a report on child soldiers in Africa.

⁵. Excerpt from a video posted on December 21, 2022 on the Facebook page of the openly pro-Russian account "Burkina Kibaya". A real promotional clip for Wagner, this cartoon is part of a series of productions of the same kind, which, since 2019, offer strong symbolism and narrative to seduce the populations and governments of African countries where those Russian mercenaries are established.

⁶. Shudu Gram's Instagram account: <https://www.instagram.com/shudu.gram/>

⁷. This photo dates back to April 2022. It was widely circulated and relayed on Twitter, attributing responsibility for this mass grave to the French military who had just returned the Gossi base to the Malian armed forces (FAMA). The publication by the French army of a video of Russian mercenaries filming and summarily burying bodies near this base revealed the maneuver to falsely accuse France of war crimes in Mali.

⁸. Since the early 2000s, Web 2.0 has allowed billions of users to exchange ideas and content on various forums, blogs and social networks. It marks a clean break with Web 1.0 by rapidly imposing itself and making the Internet a global phenomenon.

⁹. Alphabet became Google's parent company in 2015: it now manages all subsidiaries, their businesses as well as futuristic ideas. This reorganization left Google, then a global technology company, in charge of its search engine, as well as the associated web services and products, the best known of which are Gmail, Chrome, Google Play, Android, YouTube, Maps, Drive, etc.

¹⁰. Dimas Pardo, "Qu'est-ce que le Web 4.0 ?", Pandora FMS, September 29, 2020, <https://pandorafms.com/blog>.

Seeking to hack the brains of individuals, to exploit their vulnerabilities, to modify perceptions, beliefs as well as modes of thinking and actions, cognitive warfare alters the mechanisms of understanding the real world and therefore impacts decision-making¹¹. It aims at controlling human beings, both civilian and military. Destructive without necessarily being lethal, cognitive warfare harms societies by fragmenting them, sowing dissonance, polarizing public opinion and radicalizing certain groups. Certain well-documented examples demonstrate the impact of these efforts around the world: according to a U.S. intelligence report released on March 16, 2021, Russia interfered in the November 2020 U.S. presidential election to help Donald Trump win. In Britain, the Parliamentary Intelligence and Security Committee reported in July 2021 on Russian influence in the Brexit election campaign and the British government's underestimation of such interference. The present article asks, more precisely, what is happening regarding such cognitive warfare in Francophone Sub-Saharan Africa?

Although Africa took a decade less than the United States and Europe to acquire a comparable level of digital technology, the transition to digital and, more importantly, the careful consideration of the resultant challenges is not present across the continent. This poses a problem, and leads to many challenges. Given the diversity of its states, populations and economies, Sub-Saharan Africa (see [attachment A](#)) offers a heterogeneous framework for studying a particular aspect of this issue: how cognitive warfare affects signaling within the growing online entertainment market; and further, its potential for cognitive hijacking of the infosphere within that market.

If entertainment is nowadays inseparable from social networks, it is first and foremost consubstantial with gaming. Beyond its mere “playfulness”, a game can be deceptive and also serve as an interstice, a spatial and/or temporal space between imperfectly assembled sets. So many promises fulfilled by social networks – such as entertainment, networking, the sharing of emotions and opinions -- will be multiplied tenfold by tomorrow’s video games and the infinite universes offered by the metaverse.

However, these fulfilled promises hide less noble intents: diverting individuals from the essential and distracting them from problems particular to their condition. To influence, to interfere, to (dis)inform, to profit, to further agendas by destabilizing hearts and minds as well as the established order: this is the potential of imagery. Images of what we believe to see¹² will be progressively imposed on the societies of Sub-Saharan Africa which are, while traditionally cohesive and rooted in reality, ill-prepared to face the digital world and its many challenges.

Given the extent to which social networks have taken hold in “real world” Sub-Saharan Africa, it is imperative to question the role video games and the immersive technology of the metaverse will play in the near future. While the potential here is limitless, so too are the resultant problems. Furthermore, in view of the continuous progress of these technologies, virtual experiences will sow disinformation in all directions via the universal and real-time understanding enabled by artificial intelligence (AI). How can we assess the threat this poses in Sub-Saharan Africa, specifically through online entertainment? More specifically, what shape will cognitive warfare take within that particular domain?

¹¹. David Pappalardo, "La guerre cognitive : agir sur le cerveau de l'adversaire", Le Rubicon, 9 décembre 2021.

¹². The etymology of the term "video" reminds us that it derives from the Latin "I see" and the ancient Greek "eido".

After studying access to digital entertainment in Sub-Saharan Africa (Part 1), the authors will analyze the specificities of the online cognitive warfare emerging in Sub-Saharan Africa (Part 2). Then, they will focus on the new threats posed by the worlds of video games and metaverses (Part 3). Finally, they will conclude by proposing some solutions to be developed in Sub-Saharan Africa to not only measure these evolving threats, but better prepare to counter them.

1. The online entertainment ecosystem in Sub-Saharan Africa

Since the early the early 2000s, online entertainment has grown considerably in the Sub-Saharan region. According to the *Digital 2023 Global Overview Report*¹³, 64.4% of the world population is connected to the Internet and more than a half have at least one account on a social network. With heterogeneous and limited access to the Internet due to the low level of digital infrastructure, Africa is the least connected continent. Paradoxically, it is one of the regions of the world where technology has evolved the most rapidly over the past decade. According to the International Telecommunication Telecommunications Union (ITU)¹⁴, one-third of the African population uses the Internet¹⁵. While this use increased by 23% between 2019 and 2021, access to the web remains difficult, especially in the Sub-Saharan area where the lack of digital infrastructure is linked to multiple factors: low investment, inadequate regulatory and legal frameworks, limited resources and, above all, bad governance.

1.1. Sub-Saharan Africa, a fractured land of untapped potential

There is a real digital gap between Sub-Saharan African countries. This gap is accentuated by the existing disparities in the energy, digital and IT infrastructure deployed, such as energy distribution and communication networks, structures for accessing the Internet and storing data, and digital technologies that facilitate information flows and online interactions.

- 1.1.1 Energy disparities

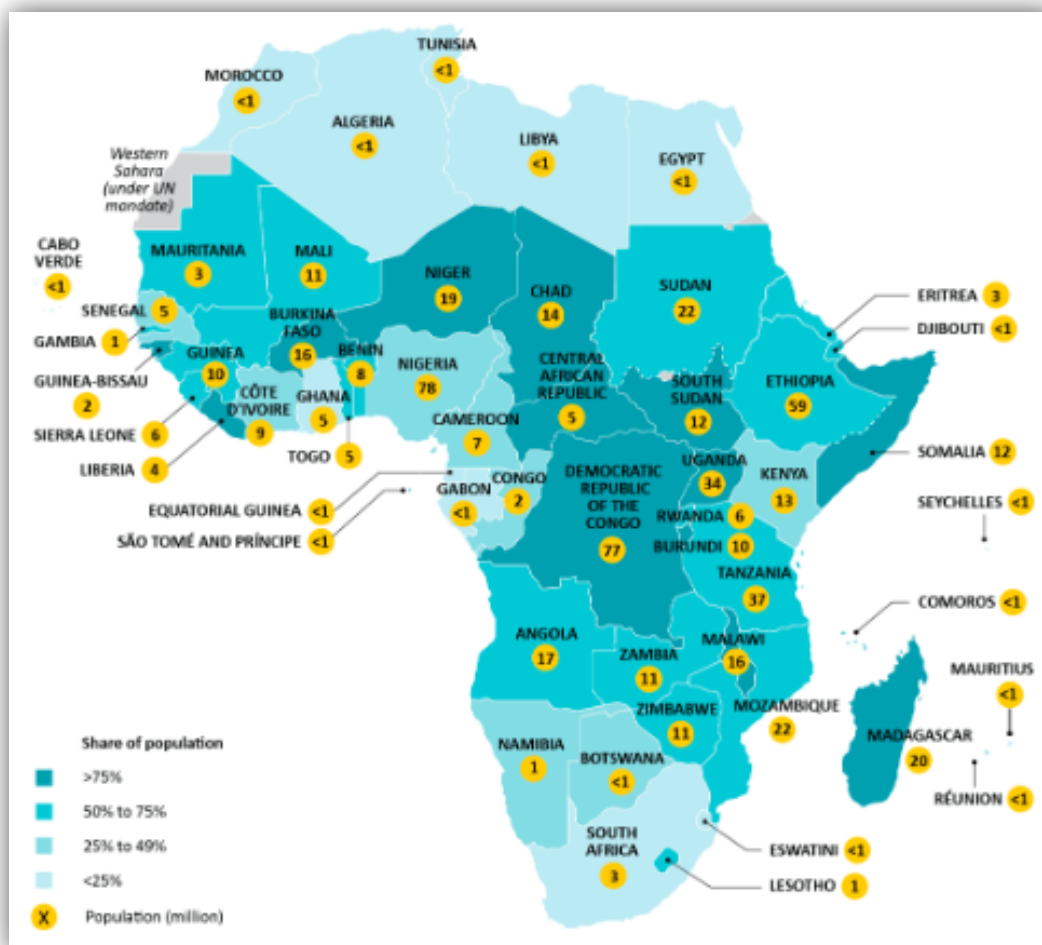
First, Internet and mobile penetration depend on energy facilities as well as the quality of services deployed. As the International Energy Agency¹⁶ (IEA) *World Energy Outlook 2019* report points out, “electrification levels in Sub-Saharan Africa remain very low compared to other developing regions of the world”. Moreover, where they exist, the facilities providing electricity are aging and poorly maintained. This is particularly the case in remote areas, such as those further inland. As shown on the map below, 55% of the population of Sub-Saharan Africa does not have access to electricity; and in thirteen countries, more than three-quarters of the population has no access to electricity.

¹³. We Are Social & Meltwater, *Digital 2023 Global Overview Report – The Essential Guide to the World's Connected Behaviours*, 2023, <https://wearesocial.com>.

¹⁴. The International Telecommunication Union (ITU) is the United Nations specialized agency for information and communication technologies – ICTs. *Connectivity in the Least Developed Countries: Status Report 2021*, <https://www.itu.int>.

¹⁵. Barthelmess, Benedikt and Langlois, Jean. "SME Financing in MENA: A Quantitative and Qualitative Analysis of Multilateral and Bilateral Development Lenders' Intermediated Lending Practices", *Review of Middle East Economics and Finance* 16, no. 3 (2020)

¹⁶. An international, intergovernmental organization founded at the OECD in 1974, the IEA publishes numerous reports on energy security and the outlook for commodities and renewable energy markets.



Population without access to electricity by country in Africa (2018)¹⁷

While the numbers increased slightly in 2022, the access rate to electricity remains below 50% in 24 African countries and West Africa continues to have some of the lowest rates in the world: 42% overall and only 8% for the rural population¹⁸.

• 1.1.2 The uneven spread of the Internet

However, this access to electricity is a prerequisite for the Internet penetration via submarine cables, cell phone installations and satellite services. By way of comparison, the continent has only one million kilometers¹⁹ of terrestrial optical fiber, while France, 55 times smaller, has seven million²⁰. While some twenty coastal countries are already connected by submarine cables and optical fiber, rural areas, desert regions of the Sahara or Central Africa, mainly

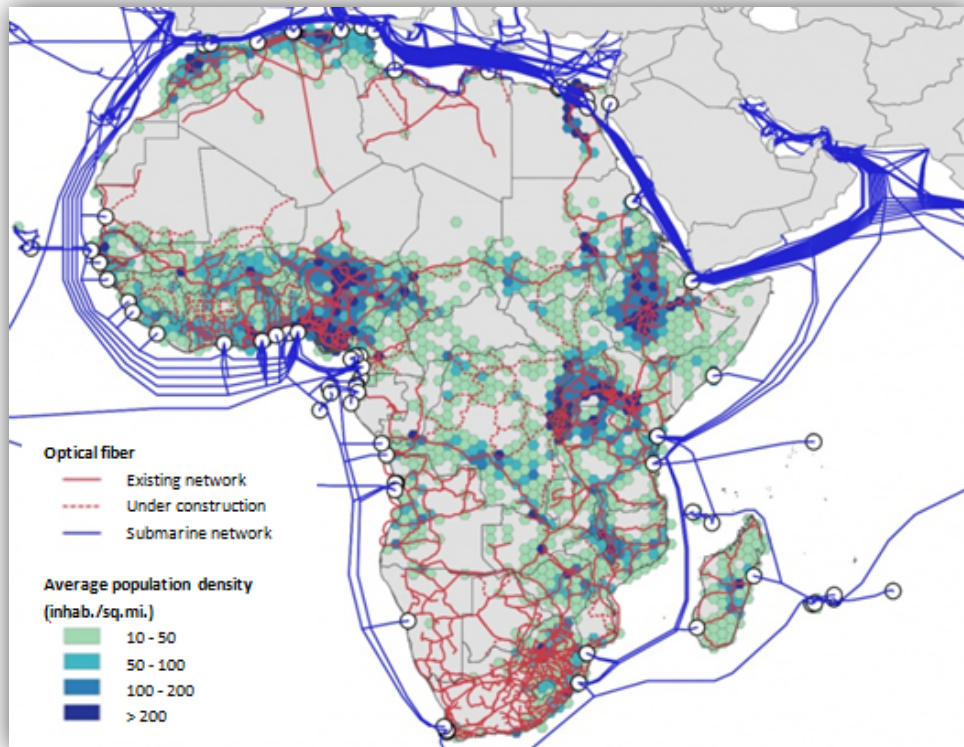
¹⁷. “Africa Energy Outlook 2019 – World Energy Outlook Special Report”, International Energy Agency, November 2019, p. 42, <https://www.iea.org/reports/africa-energy-outlook-2019>.

¹⁸. “Focus: Sub-Saharan Africa”, World Bank online, accessed February 22, 2023, <https://worldbank.org>.

¹⁹. Emiliano Toussou, “Internet en Afrique : dix ans d’évolution, d’impact sur la vie de millions de personnes, mais aussi des défis”, *WeAreTech.africa*, April 9, 2022, <https://www.wearetech.africa/fr/fils/actualites/internet-en-afrique-dix-ans-d-evolution-d-impact-sur-la-vie-de-millions-de-personnes-mais-aussi-des-defis>.

²⁰. “Combien de km de fibres ?”, July 14, 2005, Billaut Typepad (blog), https://billaut.typepad.com/jm/2005/07/combien_de_km_d.html.

French-speaking, are still excluded from this network. Conversely, the most developed Internet ecosystems in Sub-Saharan Africa are in South Africa, Kenya and Nigeria²¹, three English-speaking countries.



Existing and under-construction terrestrial and submarine fiber optic networks²²

• 1.1.3 Incomplete satellite coverage

Regarding the satellite alternative, it is still costly and remains incomplete. While some countries²³ have tried to launch their own telecommunication satellites with Chinese, American or Russian funding, few countries are benefiting from private constellations such as Starlink²⁴, whose ambition is to cover the entire continent by offering reliable Internet access to the most remote and landlocked areas of the continent. While Nigeria (the continent's largest economy and most populous country) is the pioneer here, Mozambique, Kenya, Angola, the Democratic Republic of Congo, Tanzania and Zimbabwe are expected to join the Starlink network by 2023. Plans for the Elon Musk-owned business include expansion to 14 countries on the continent by 2024 and 16 more countries thereafter²⁵.

²¹. These countries have the most interconnected networks and have managed to exchange 70 to 80% of their traffic locally.

²². International Telecommunications Union (ITU), *op.cit.*

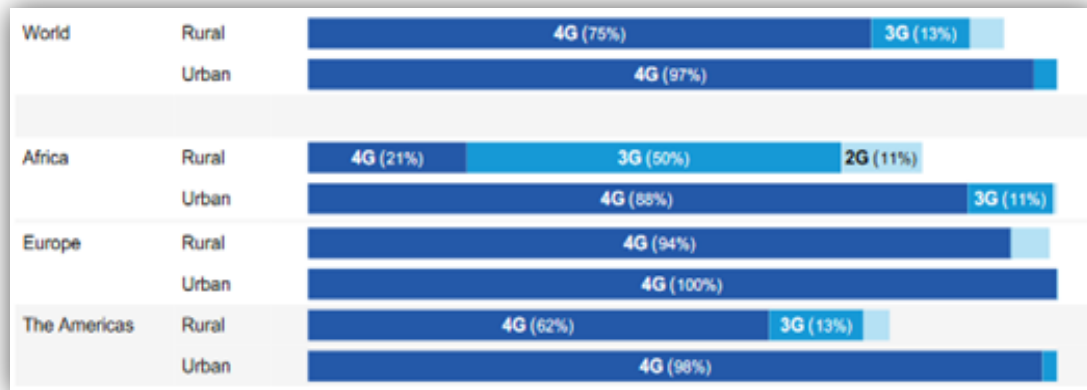
²³. For Sub-Saharan Africa and according to data from 2021, these are South Africa (9 satellites), Nigeria (6), Ghana (1), Ethiopia (1), Kenya (1) and Rwanda (1).

²⁴. Based on 3,200 telecommunication satellites placed in low orbit (500 km altitude), Starlink offers communication speeds between earth and space that are fifty times faster than those of conventional satellites. By 2025, the network should number 12,000 satellites.

²⁵. Kofi Gabriel, "Internet à haut débit par satellite : Starlink d'Elon Musk lance ses activités en Afrique", *Le 360 Afrique*, February 2, 2023, <https://afrique.le360.ma>.

- 1.1.4 The slow progress of cellular coverage

In addition, mobile network coverage in Sub-Saharan Africa does not fill the gaps regarding Internet access. Although private operators have accelerated their investments in 3G and 4G networks²⁶, 18% of the African population still has no mobile network coverage, 11% has only a 2G coverage, and nearly 30% of the rural population cannot connect to the Web²⁷. Furthermore, while Internet and mobile penetration are increasing, they are still below the level of the rest of the world. The Sahara region, West Africa and Central Africa, which are predominantly Francophone, are the least well-connected regions in Sub-Saharan Africa.



Population coverage by type of mobile network and area (2021)²⁸

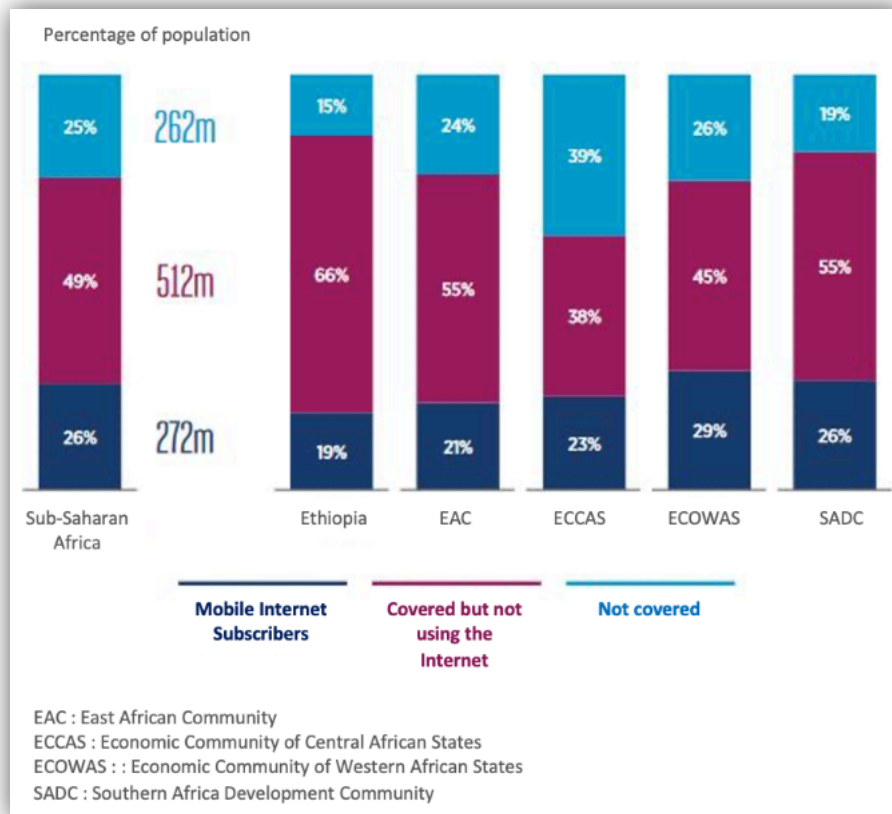
The penetration rate of mobile networks (26% of subscribers) should also be distinguished from that of mobile phones. While 49% of the Sub-Saharan population has cellphone coverage, Internet access remains beyond reach due to a lack of equipment. Moreover, the widespread prevalence of older mobile phones does not allow access to 3G and 4G networks, and the high costs of more modern smartphones and Internet packages are prohibitive. In addition, beyond issues of infrastructure and network quality, the unconnected populations must also contend with weaker digital skills as well as financial access issues. Indeed, the lack of access to banking services affects nearly half of the adult population²⁹, and according to the World Bank, 90% of transactions are still conducted in cash.

²⁶. GSMA, *L'Economie Mobile Afrique subsaharienne 2020*, p31.

²⁷. ITU, *op. cit.* This coverage gap is comparable to that observed in the Americas where 22% of the rural population is not covered at all and 4% is covered only by 2G.

²⁸. International Telecommunications Union (ITU), *Facts and figures 2021 Report*, 2021, p12, <https://www.itu.int/itu-d/reports/statistics/facts-figures-2021/>.

²⁹. Mastercard, "The Future of Fintech - Africa", October 2022, https://newsroom.mastercard.com/mea/files/2022/10/Mastercard-Future-of-Fintech-in-Africa_Final1.pdf



Comparative graph of subscribers and coverage between different Sub-Saharan African regions³⁰

In terms of infrastructure, network coverage, and taxes levied to access the Internet, inequalities in Sub-Saharan Africa inequality between connected and under-connected countries remains stark. Despite these differences, internet access has increased³¹ during the pandemic owing to increased remote work and distance learning, as well as the uptick in consumption of online entertainment, such as social networks.

1.2 Online entertainment penetration in Sub-Saharan Africa

• 1.2.1 Why social networks have become essential

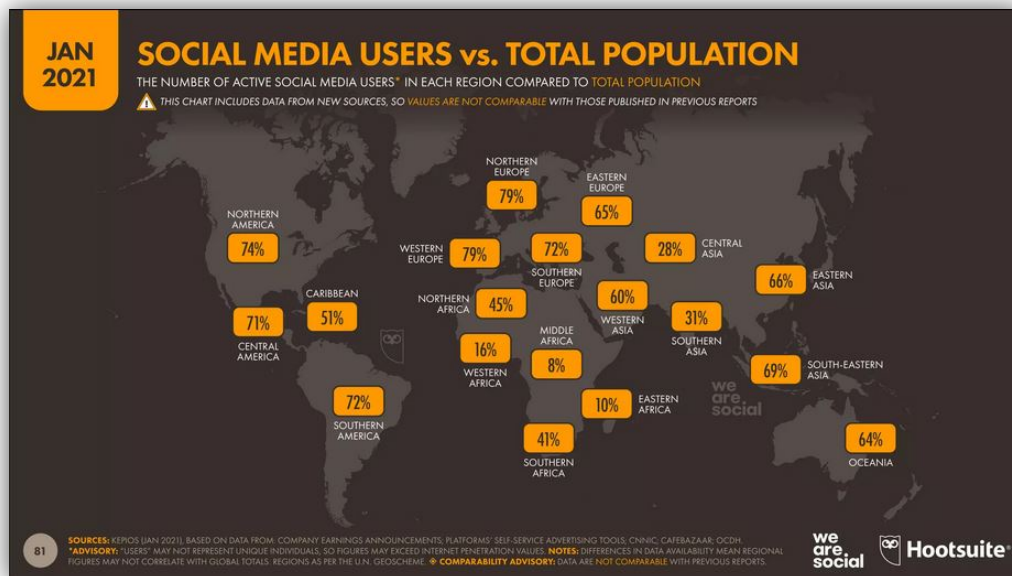
While technology and investment are progressing slowly, globalization has been more pronounced in Sub-Saharan Africa. As with youth worldwide, Africa's youth³² are everyday more connected: 40% of young Africans have access to the Internet compared to only 26% of

³⁰. GSMA, *op. cit.*, p30.

³¹. According to the magazine Jeune Afrique, Free Senegal has noted during the coronavirus crisis a "boom" of 20% of traffic on the mobile Internet. In the Democratic Republic of Congo and Ghana, the operator Vodacom has noted increases in data consumption of 30% and 22%.

³². According to UNESCO, 60% of the African population is under 20 years old.

the rest of the population³³. Moreover, while it is still below 10%, the penetration rate of social networks continues to increase³⁴ on the African continent³⁵, especially among youth.



Map measuring the percentage of social network users by geographical areas³⁶

Indeed, through social networks, the African "Android generation"³⁷ is being introduced to the immediacy of the world, eager to move beyond its neighborhood and discover the larger world. Self-promotion tools, platforms and applications facilitate instant communication with family, friends or professional circles to reach a level of intimacy that space and time constraints had previously made impossible. However, many of these social networks flatter users' egos and advance biases of social desirability³⁸ or the "cherry picking"³⁹ syndrome. Everyone can consume the content that is offered to them: Algorithms feed and thrive on the monetization of our attention. The particular orientation of the proffered content generates insatiable interest among users who are unwittingly being subjected to confirmation⁴⁰ biases. Dangerously converging with numbness or ennui, the entertainment offered by social networks presents an additional risk to Sub-Saharan Africa populations, many of which are less digitally literate than populations elsewhere and, thus, more prone to being influenced by disinformation.

³³. GSMA, *op. cit.*, p.30.

³⁴. At the beginning of 2022, 4.62 billion users (60% of the world's population) were active on social networks (compared to 4.2 (53%) in 2021, 3.7 in 2020 and less than 3 before 2018).

³⁵. In 2022, 6.6% of active users on social networks were located in Africa, mainly in North Africa and Southern Africa.

³⁶. We Are Social & Meltwater, *Digital 2021 Global Overview Report – The Essential Guide to the World's Connected Behaviours*, 2021, <https://datareportal.com/reports/digital-2021-global-overview-report>.

³⁷. In his speech on February 11, 2021, Cameroonian President Paul referred to young Africans as the "Android generation," in part to emphasize their key role in the invention and use of new digital technologies.

³⁸. It is the tendency of individuals to want to present themselves in a favorable light (Hays, 1989) and not to report information that would make them look bad (Fisher, 1993).

³⁹. This is a method of presenting facts that gives credence to an opinion by ignoring cases that contradict it.

⁴⁰. Confirmation bias is an instinctive tendency of the human mind to look for information that confirms one's way of thinking, and to neglect anything that might challenge it.

In addition, the anonymity offered by social networks allows people to avoid being directly identified and thereby facilitates free speech. With everyone able to share their opinion, democracy and freedom of expression play out online, on social networks. Owned by foreign⁴¹ private actors like [GAFAM](#)⁴² in the West and [BATX](#)⁴³ in the East, social networks are instrumentalized sounding boards whose effects are sometimes poorly controlled and can be weaponized against backlash from the "#EndSARS"⁴⁴ protest movement launched on Twitter in 2017 to fight against the abuses of this police unit ended in a real armed repression⁴⁵. Conversely, in 2014, the *Bring Back Our Girls* movement supported by Michelle Obama contributed to the release of 107 of the 276 high school girls in the town of Chibok kidnapped by Boko Haram.

- 1.2.1 *Gaming, a market that is still in its infancy*

- ◆ a) *Current tendencies*

While social networks make up the bulk of online entertainment in Sub-Saharan Africa, video gaming is on the rise. Still and despite the number of African gamers has doubled in five years to 186 million by 2021⁴⁶, it appears that Sub-Saharan Africa “does not have the gaming culture, at least not yet”⁴⁷.

With some 4.5% of the world's gamers, the African market currently represents less than 1% of the sector⁴⁸, while the video game industry generated \$175.8 billion (about €156 billion) in 2021. Furthermore, the African gaming market is segmented by platform (PC, smartphone, tablet, game console) and by region, as can be seen in the maps below.

⁴¹. In an article published in March 2021, Ali Ibrahim Junior notes that there is still no African social network: all attempts have been in vain.

⁴². GAFAM stands for Google, Apple, Facebook, Amazon, Microsoft, “the Five” biggest American platforms that dominate the digital market.

⁴³. BATX stands for Baidu, Alibaba, Tencent, Xiaomi, the four Chinese companies that dominate the Chinese Internet.

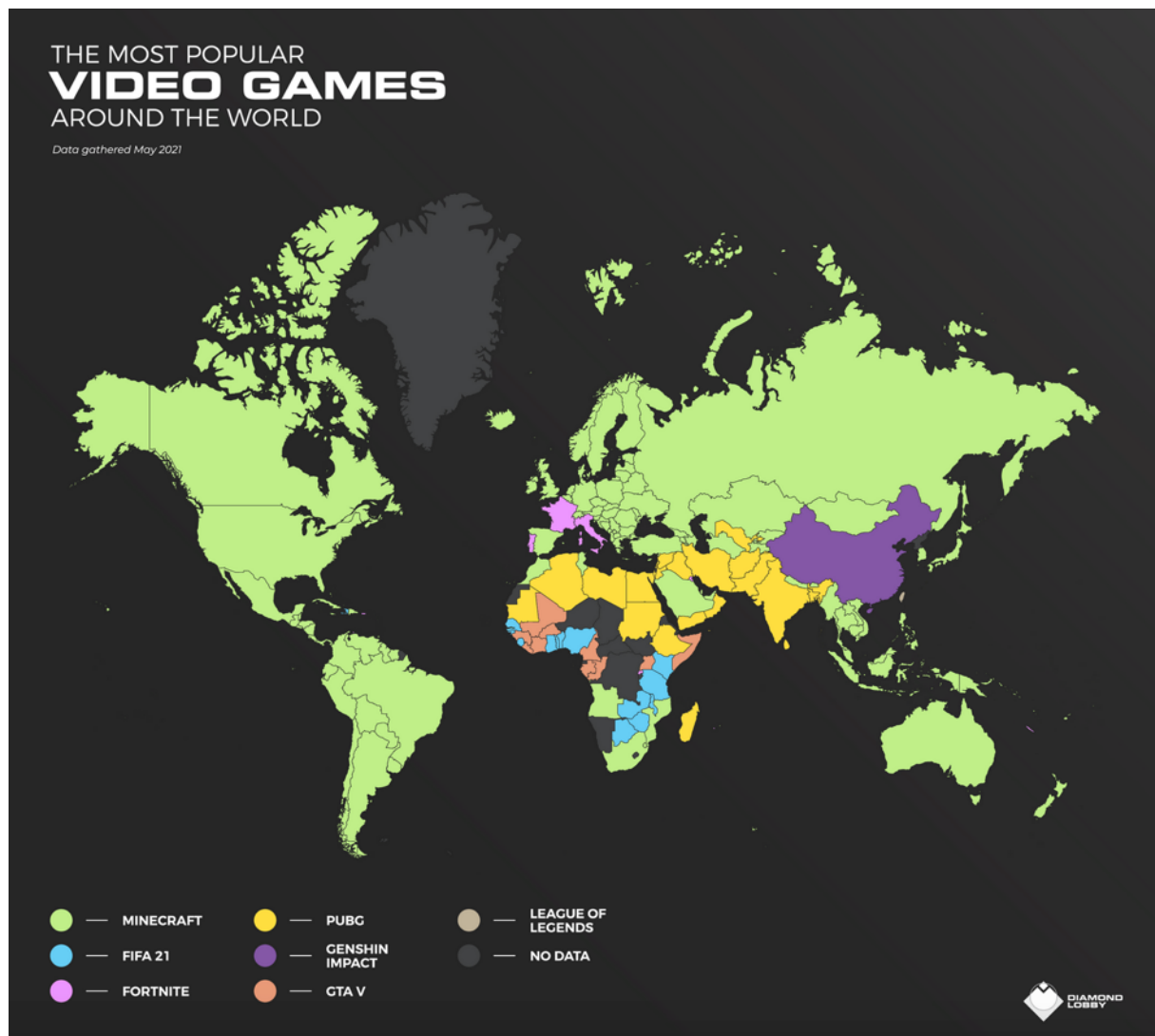
⁴⁴. The *Special Anti-Robbery Squad* is a Nigerian police unit specialized in the fight against organized crime created in 1992.

⁴⁵. The *Special Anti-Robbery Squad* is a Nigerian police unit specialized in the fight against organized crime created in 1992.

⁴⁶. Joint study by the Dutch consultancy Newzoo and Carry1st (Africa’s #1 mobile publisher)

⁴⁷. Marine Jeannin, “Racisme et sexisme dans les jeux vidéo : ces initiatives qui montent pour un gaming plus inclusif”, Le Monde, October 31, 2022, <https://www.lemonde.fr/afrique/article>.

⁴⁸. Study Newzoo and Carry1st



World map of the most popular video games⁴⁹

While Minecraft⁵⁰ tops the charts worldwide, Africa is missing out on this trend, which can only be found seen the southern part of the continent (South Africa, Angola, Eswatini, Mozambique), St. Helena, Cape Verde, and two French-speaking countries in the North (Tunisia and Morocco). While FIFA 21 and GTA 5, two games accessible only on computers and consoles, are popular in West and East Africa, the success of PlayerUnknown's Battlegrounds (PUBG)⁵¹ across the continent can be explained by its free access since 2018 on Android and iOS mobile phones, as well as its lite version designed to run in areas with slow connections.

⁴⁹. Luke Jordan, "What's the Most Popular Game Around the World?", Diamond Lobby, February 22, 2023, <https://diamondlobby.com/geeky-stuff/most-popular-game-in-the-world/>

⁵⁰. Minecraft is a 2011 video game that offers universes composed of 3D pixels (voxels) that can be freely constructed by exploiting and transforming the natural resources present in the game. Originally developed as a browser game, the game is available in 139 languages, on Android and iOS mobile phones, as well as on various consoles (Microsoft's Xbox, Sony's PlayStation, Nintendo's Wii and Switch).

⁵¹. PUBG: Battlegrounds is a free-to-play, multiplayer, online survival shooter for consoles and smartphones.



Map of the most popular video games in Africa⁵²

In fact, in Sub-Saharan Africa, 95% of gamers use their phone⁵³ rather than a console or a personal computer⁵⁴ and according to a comparative study⁵⁵ conducted by the National Center for Biotechnology Information (NCBI), smartphone games in Africa represent 24% of the global gaming market⁵⁶. Moreover, if the use of the Internet on mobile phones is growing by 9% per year in Africa⁵⁷, one of the main reasons for acquiring a smartphone is to be able to

⁵². Luke Jordan, *op.cit.*

⁵³. Ibid.

⁵⁴. Yassin Ciyow, “Malgré une forte demande, l’Afrique de l’Ouest peine à se faire une place dans l’industrie du jeu vidéo”, *Le Monde* online, December 1, 2021, <https://www.lemonde.fr/afrique>.

⁵⁵. Olatz Lopez-Fernandez et al., “Mobile Gaming and Problematic Smartphone Use : A Comparative Study Between Belgium and Finland”, January 8, 2018, <https://doi.org/10.1556%2F2006.6.2017.080>.

⁵⁶. “Africa Gaming Market – Growth, Trends, COVID-19 Impact, and Forecasts (2022 – 2027)”, Mordor Intelligence, January 2022, <https://www.researchandmarkets.com/reports/5239593/africa-gaming-market-growth-trends-covid-19>.

⁵⁷. “Game developers draw on African stories to create new worlds”, *The Economist* online, September 9, 2022, <https://www.economist.com>?

play mobile games⁵⁸, and mainly downloadable mobile games, popular, in large part, because they do not require a permanent connection. Finally, while the continent shows great interest in different types of games (shooting video games, adventure games, online casinos and other sports betting venues), the top 10 most downloaded mobile games are a mix of titles that are equally popular around the world.

✓	#	Unified App	Classification	Downloads ↕	Revenue ↕	RPD As of Dec 31, 2022 ↕
✓	1	Subway Surfers Sybo	Runner Action	17.0m ↑5m	\$135k ↑\$39k	\$0.02 ↓<\$0.01
✓	2	FIFA Soccer Electronic Arts	Simulation Sports Sports	12.5m ↑8m	\$1.28m ↑\$658k	\$0.11 ↓<\$0.01
✓	3	Candy Crush Saga King	M3 Match	11.4m ↑2m	\$7.47m ↑\$1m	\$0.50 ↑\$0.03
✓	4	Free Fire Garena Online	Battle Royale Shooting	10.7m ↑914k	\$2.52m ↓\$678k	\$0.25 ↓<\$0.01
✓	5	8 Ball Pool Miniclip	Simulation Sports Sports	9.48m ↑1m	\$941k ↑\$20k	\$0.14 ↓\$0.01
✓	6	Piano Fire Adaric Music	Music Hypercasual	8.86m ↑6m	\$9.2k ↑\$9k	<\$0.01 ↑<\$0.01
✓	7	Soccer Super Star Real Free Soccer	Simulation Sports Sports	8.61m ↑2m	\$12.6k ↑\$8k	<\$0.01 ↑<\$0.01
✓	8	PUBG MOBILE Tencent	Battle Royale Shooting	8.15m ↓2m	\$8.97m ↓\$208k	\$0.57 ↑\$0.12
✓	9	Magic Tiles 3 Amanotes	Music Hypercasual	8.12m ↓184k	\$86.3k ↓\$3k	<\$0.01 ↑<\$0.01
✓	10	Dream League Soccer 2020 First Touch	Simulation Sports Sports	7.88m ↑2m	\$613k ↑\$135k	\$0.07 ↑<\$0.01

Top 10 mobile games by downloads in Africa over 2022⁵⁹

✓	#	Unified App	Classification	Downloads ↕	Revenue ↕	RPD As of Dec 31, 2022 ↕
✓	1	PUBG MOBILE Tencent	Battle Royale Shooting	8.15m ↓2m	\$8.97m ↓\$208k	\$0.57 ↑\$0.12
✓	2	Candy Crush Saga King	M3 Match	11.4m ↑2m	\$7.47m ↑\$1m	\$0.50 ↑\$0.03
✓	3	Coin Master Moon Active	Luck Battle Party	1.55m ↑688k	\$4.57m ↑\$1m	\$2.72 ↑\$0.15
✓	4	ROBLOX Roblox	Creative Sandbox Simulation	4.90m ↑805k	\$4.01m ↑\$421k	\$0.73 ↑\$0.04
✓	5	Call of Duty: Mobile Activision Publishing	Team Deathmatch Shooting	2.11m ↑214k	\$3.51m ↓\$140k	\$0.84 ↑\$0.20
✓	6	Evony Top Games	4X March-Battle Strategy	1.89m ↓2m	\$3.00m ↑\$1m	\$0.80 ↑\$0.25
✓	7	Gardenscapes - New Acres Playrix	M3-Meta Match	3.34m ↑1m	\$2.79m ↓\$692k	\$1.03 ↓\$0.06
✓	8	Clash of Clans Supercell	Build-Battle Strategy	1.16m ↑152k	\$2.56m ↑\$111k	\$2.35 ↓\$0.02
✓	9	Free Fire Garena Online	Battle Royale Shooting	10.7m ↑914k	\$2.52m ↓\$678k	\$0.25 ↓<\$0.01
✓	10	Fishdom: Deep Dive Playrix	M3-Meta Match	5.35m ↑3m	\$2.49m ↑\$635k	\$0.64 ↓\$0.13

Top 10 mobile games by revenue in Africa over 2022⁶⁰

◆ *b) Video games, those new social networks*

It should also be noted that video games are increasingly becoming the new social networks. Initially places of entertainment, they are evolving into places to meet and share. Developers

⁵⁸. Yassin Ciyow, *op. cit.*

⁵⁹. Abhimanyu Kumar, "Africa's Mobile Gaming Market and Carry1st", Feb 4, 2023, <https://naavik.co/deep-dives/africa-carry1st>.

⁶⁰. Ibid.

have even created chat rooms to encourage dialogue within guilds in massive multiplayer online role-playing games (MMORPGs). Thanks to live video streaming services (VAD) such as Twitch or instant messaging software such as Discord⁶¹, the game becomes interactive: it is now possible to play, but also to write, talk, and watch other players in real time. Games such as World of Warcraft and Minecraft have spawned many virtual communities where players develop their own languages based on shared interests and knowledge. Voice chat is becoming increasingly popular because it is more convenient to play and allows spontaneous contact, more direct than in “traditional” social networks. Thus, video games allow communication in a new way; and beyond “gamers”, they are beginning to attract the attention of new audiences, including younger people, activist and political groups and content creators, but also “average people” who just want to “talk about their day”⁶².

Although sub-Saharan Africa remains far behind the rest of the world in terms of video games, the increase in connectivity as well as online entertainment options comes accompanied by an awareness of increasing local pride: “End dominated Africa, make way for a sovereign Africa!” and its accompanying rally cry: Africa for Africans!⁶³.

1.3 Sub-Saharan Africa, a continent of digital repression

The digital divide in Sub-Saharan Africa does not mean that there are no laws or regulations governing online entertainment. On the contrary, some countries on the continent are particularly active in this area, especially in limiting fraud and underage access to gambling⁶⁴. South Africa, which has the most developed online betting market on the continent at \$2.3 billion⁶⁵ was the first country on the continent to pass laws and regulations in this area⁶⁶. Beyond this part of online entertainment, and more globally, more and more African countries are adopting restrictive laws to fight the rise of digital crime, especially on social networks.

Tanzania, for example, passed its first cybercrime law in 2015, banning all offensive speech and authorizing at-will crackdowns on anti-government whistleblowers. Then, in 2018, the Electronic and Postal Communications Regulation banned Tanzanian media outlets from broadcasting foreign content on their platforms without prior government permission, as Reporters Without Borders noted⁶⁷. According to two joint reports by Amnesty International and Human Rights Watch published in October 2019, the Tanzanian state apparatus “has adopted and enforced a series of repressive laws that muzzle independent journalism and

⁶¹. Discord is a free, secure, all-in-one voice and text chat that works on PCs and smartphones and is designed for gamers. By 2020, this chat will have 250 million users and 850 million messages exchanged daily.

⁶². Agathe Charbonel, “Jeux vidéo, les nouveaux réseaux sociaux ?”, Digital Media Knowledge, January 25, 2020, <https://digitalmediaknowledge.com/medias/jeux-video-les-nouveaux-reseaux-sociaux/>.

⁶³. Bruno Clément-Bolée, “Fini l’Afrique dominée, place à l’Afrique souveraine et son message : l’Afrique aux Africains”, *Le Monde* online, January 26, 2023, <https://www.lemonde.fr/idees/article>.

⁶⁴. Mordor Intelligence, *op.cit.*

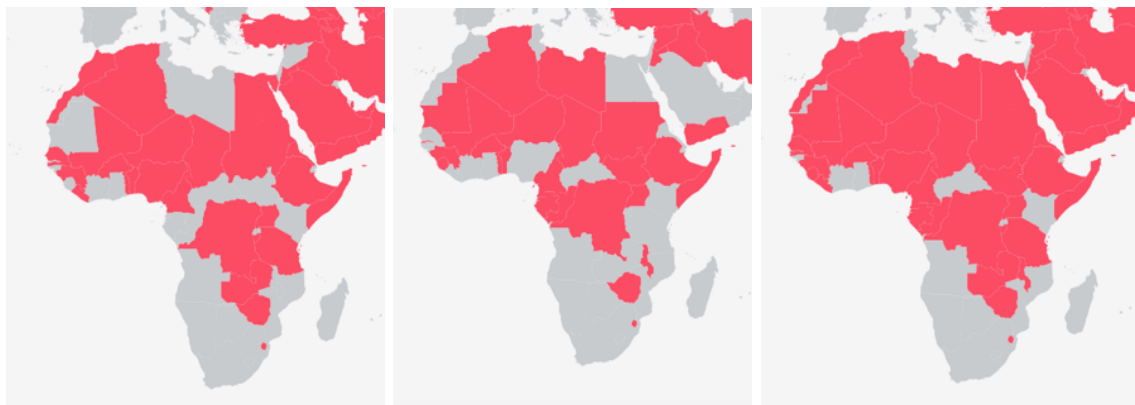
⁶⁵. “Les jeux d’argent gagnent en popularité en Afrique”, Les Afriques, January 25, 2023, <https://lesafriques.com/2023/01/les-jeux-dargent-gagnent-en-popularite-en-afrique/>.

⁶⁶. “Avec les nouvelles réglementations, le ciel est la limite pour les jeux d’argent en Afrique”, SIGMA, November 20, 2020, <https://sigma.world/fr/news/avec-les-nouvelles-reglementations-le-ciel-est-la-limite-pour-les-jeux-dargent-en-afrique/>.

⁶⁷. Tanzanie : RSF dénonce de nouvelles mesures qui renforcent le contrôle de l’Etat sur les médias, Reporters Sans Frontières, August 20, 2020, <https://rsf.org/fr/tanzanie-rsf-denonce-de-nouvelles-mesures-qui-renforcent-le-contrôle-de-l-etat-sur-les-médias>

severely restrict the activities of NGOs and the political opposition”⁶⁸. Finally, in July 2020, new restrictions on online content directly targeted users of social networks such as WhatsApp, Facebook, Twitter, Instagram, and YouTube⁶⁹.

The case of Tanzania illustrates the phenomenon of digital repression that is spreading on a larger scale in Sub-Saharan Africa. While this takes the form of vague cybercrime laws that expand executive powers to muzzle any opposition movement, the phenomenon also translates concretely into restricting access to the Internet and telecommunications to supposedly combat the threats of terrorism, organized crime, and secessionist violence⁷⁰. As shown in the maps below, many countries in Sub-Saharan Africa have experienced restrictions on access to social networks and the Internet over the past decade.



Restricted Social Media & Voice Communication in the past

Disrupted Internet Connection in the past

Disrupted Internet Services in the past

Maps showing Internet access restrictions and blackouts in Africa⁷¹

Thanks According to the Surfshark Internet Shutdown Tracker⁷², it appears that Sub-Saharan Africa has been hit hard by Internet censorship:

- 8 out of 10 Africans have been affected by Internet and social media shutdowns. In total, 76.8% of the continent's population is affected.
- 34 African countries are affected by blocked access to social media.
- Of the 101 interruptions recorded since the beginning of 2023, 50 are related to demonstrations, 24 to elections and 27 to political unrest.
- These are the most recent cases observed:

⁶⁸. “Tanzanie. Avec l’intensification de la répression, le pays est confronté à la peur et à la censure”, Amnesty International, October 28, 2019, <https://www.amnesty.org/fr/latest/news/2019/10/tanzania-climate-of-fear-censorship-as-repression-mounts-2/>.

⁶⁹. Bob Karashani, “Posting rumours on social media could land you in Tanzania jail”, The EastAfrican, August 10, 2020, <https://www.theeastafrican.co.ke/tea/news/east-africa/posting-rumours-on-social-media-could-land-you-in-tanzania-jail-1915620>

⁷⁰. Nathaniel Allen, Catherine L. Kelly, “Deluge of Digital Repression Threatens African Security”, *Africa Center for Strategic Studies*, January 4, 2022, <https://africacenter.org/spotlight/deluge-digital-repression-threatens-african-security/>

⁷¹. Internet shutdown tracker, Surfshark, February 20, 2023, <https://surfshark.com/research/internet-censorship?ref=benjamindada-com-modern-tech-media-in-ssa>

⁷². Idem

- In Suriname, on February 17, 2023, with the restriction of access to the social networks Facebook, Instagram, Messenger and WhatsApp during protests against the rising cost of living, which led to the storming of the National Assembly.
- In Tanzania, on February 15, 2023, on the social audio platform Clubhouse, often used by activists and the diaspora.
- In Ethiopia, on February 9 and 10, 2023, during protests related to the split in the Ethiopian Orthodox Church, YouTube, Facebook, Telegram, and TikTok were restricted.

It turns out that these facts, as well as the trends observed over the medium term, are straining the balance between freedom and security in the countries concerned. In addition, social networks and new technologies, including software used to track terrorists, are being used by governments to monitor political opponents and journalists⁷³.

⁷³. Nathaniel Allen, Catherine L. Kelly, *op. cit.*

2. Evolution of the informational struggle in Sub-Saharan Africa through online entertainment: a catalyst of destabilization

2.1 The fake digital wave in Sub-Saharan Africa

As a space without borders and without international governance, the Internet has amplified the phenomena of interconnection and interdependence, which are the sources of many challenges, unprecedented in the history of Sub-Saharan Africa. More and more states feel that they are losing control over cyberspace because the omnipotence of social networks is becoming complex to counter. As a reflection of societies and of the permanent tensions that run through them, online entertainment is being perverted by becoming an inescapable vector of disinformation.

- *2.1.1 The origins of information manipulation*

Information manipulation and information are consubstantial. From the Neolithic era, where we find its first traces with the use of decoys, to the importance given to it by Sun Tzu in the 6th century in *The Art of War*, the manipulation of information has been a constant in human history. Understood as “the intentional and massive dissemination of false or biased news for hostile political purposes”⁷⁴, it has spanned the centuries and given rise to numerous metamorphoses: disinformation, misinformation, malinformation, propaganda ...

	Wrong Information	Intent to harm
Disinformation	Yes	Yes
Malinformation	No	Yes
Misinformation	Yes	No
Propaganda	Yes	Yes + psychological intoxication
Advertisement	Possible	No

While no society is immune to the manipulation of information, today's renewed interest in it is linked to the unprecedented capacity for rapid dissemination and virality offered by online entertainment, as well as to the multiple crises affecting Sub-Saharan Africa. Indeed, the messages disseminated online have the capacity to influence reality, and despite rare warnings from platforms⁷⁵, the use of social networks to distort reality and amplify content is exponential. Taking advantage of the lack of laws against misinformation and hate speech, “social media influencers have become mercenaries who manufacture misinformation and hate speech”⁷⁶.

- *2.1.2 Speed, virality and danger*

⁷⁴. Alexandre Escorcica, Jean-Baptiste Jeangène Vilmer, “Les manipulations de l’information, un défi pour nos démocraties”, Les Carnets du CAPS, June, 2018, p2.

⁷⁵. In Kenya, TikTok warned its users against misinformation by publishing guidelines ahead of the August 2022 elections.

⁷⁶. Joint statement by six Kenyan civil society organizations, April 2022.

Election periods are particularly conducive to disinformation campaigns⁷⁷. During these periods, “messaging systems such as WhatsApp or platforms (Facebook and Twitter mainly) are used as microblogs” that rival groups exploit to divide opinion in order to win the elections⁷⁸. Moreover, through WhatsApp loops, information, whether true or false, is presented in the form of buzz that can be easily and quickly shared *ad infinitum*⁷⁹. From a private interest group on a given topic, information is published, then taken up and relayed by the members of this group to other circles, repeating the same pattern. Because of the nature of the links that unite social network users to their circles, a piece of information can be passed around to thousands of people in less than a day. Viral and contagious, the information relayed must also be apprehended under the prism of danger. Indeed, discussion groups can quickly turn into a hateful crowd: the “pillory 2.0”⁸⁰, if it develops virtually, manifests itself concretely in the real world. For example, in September 2022 in Burkina Faso, a new putsch accompanied by an intense disinformation campaign took place: Paul-Henri Sandaogo Damiba, head of the junta, was overthrown by Captain Ibrahim Traoré. On social networks, false information was circulating supporting the new strongman and attacking France, which was accused of involvement in the coup by air-dropping French soldiers over Ouagadougou.



Pictures of false information circulating on Tweeter during the September 2022 coup in Burkina Faso⁸¹

⁷⁷. Karen Allen, “Qui alimente la désinformation en Afrique”, Institute for Security Studies (ISS), September 7, 2022, <https://issafrica.org>.

⁷⁸. Bonface Beti, consultant at the Institute for Security Studies (ISS).

⁷⁹. In 2018, WhatsApp decided to limit message forwarding to twenty people or groups to counteract fakenews. The message then appeared with the words “transferred many times”. In 2019, a further reduction was imposed: the transfer is limited to five recipients.

⁸⁰. Erwan Cario, “Lynchages en réseaux”, *Libération* online, April 11, 2018, <https://www.liberation.fr>.

⁸¹. Sophie Malibeaux, Grégory Genevriér, “Au Burkina Faso, un coup d’État accompagné par la désinformation”, *RFI* online, October 7, 2022, <https://www.rfi.fr>.

- *2.1.3 A wave amplified by external influence*

While, in Kenya in August 2022, online disinformation orchestrated by influencers was "100% local"⁸², influence and interference also came from outside. Indeed, the diaspora is used for other purposes as well, and it can be instrumentalized too. For example, in November 2020, amid an information blackout on the Tigray conflict between the Ethiopian government and the Tigray People's Liberation Front (TPLF), an investigation⁸³ revealed that members of the Ethiopian diaspora had engaged in an online clash over competing narratives explaining the outbreak of the conflict. Despite the lack of independently verifiable information, [click-to-tweet](#) campaigns were conducted anonymously from the U.S. by Ethiopian expatriates of all stripes, using hashtags and tagging NGOs, foreign government officials and journalists in their tweets. For example, the pro-government Ethiopian website Global Ethiopian Advocacy Nexus (GLEAN) posted the following tweet, tagging seven U.S. senators and claiming that publications opposed to the Tigray conflict were spreading false information.



Moreover, it is often through influencers from the diaspora that disinformation is propagated on social networks. Reference to "the lady of Sochi"⁸⁴ is illustrative here: Nathalie Yamb is an activist of Swiss-Cameroonian origin and one of the fiercest denouncers of France in Africa. With over 200,000 followers on Twitter and nearly 160,000 on YouTube, she also denounces Western accusations against Russia and supports its intervention in Ukraine. From social networks to videogames, the potential of online communities to get people involved and engaged is undeniable.

⁸². Odanga Madung, data journalist and researcher for the Mozilla Foundation.

⁸³. Tessa Knight, "Ethiopian diaspora groups organize click-to-tweet Tigray campaigns amid information scarcity," Digital Forensic Research Lab (DFRLab), April 23, 2021, <https://medium.com/dfrlab>

⁸⁴. Cyril Bensimon, « Nathalie Yamb, l'influenceuse qui veut chasser la France d'Afrique », *Le Monde*, May 18, 2022, https://www.lemonde.fr/afrique/article/2022/05/18/nathalie-yamb-l-influenceuse-qui-veut-chasser-la-france-d-afrique_6126684_3212.html.

Like a tsunami, disinformation is sweeping across Africa. This is attributable to several reasons:

- First, mobile devices have become the primary means of accessing the Internet, which makes it easier for actors to reach target audiences and spread propaganda or disinformation campaigns (Shurkin, 2022).
- Secondly, the removal of inauthentic content is not a priority for the different platforms nor for the countries. If the detection and identification of these campaigns, which are becoming increasingly sophisticated, require many resources (human and material), social media platforms are reluctant to take measures or invest in the level of moderation of African content necessary to curb disinformation in real time⁸⁵.
- Above all, the analysis of weak signals reveals that the emerging opportunities and threats related to online entertainment are growing steadily to the point that disinformation campaigns tend to become confused with cognitive warfare operations.

2.2 Weak signals of the growing use of cognitive warfare in Sub-Saharan Africa

As a valuable tool for identifying emerging threats related to the use of new technologies for cognitive warfare, weak signal analysis allows one to remain vigilant and take proactive measures to stay ahead of these threats and minimize their impact on individuals and societies (Boisset & Langlois-Berthelot, 2021). In order to properly analyze the specificity of digital cognitive warfare in Sub-Saharan Africa, it is first necessary to recall the definition of cognitive warfare.

- *2.2.1 On the need to define cognitive online warfare (CoW)*

Langlois-Berthelot (2022) defines cognitive online warfare as the use of Internet-based platforms and technologies to influence and manipulate perceptions, beliefs, and behaviors of individuals or groups for strategic purposes. In the context of Sub-Saharan Africa, online cognitive warfare has become an increasingly prevalent and important threat to security and stability. State and non-state actors are using these tactics to advance their interests: their targets are no longer just military or intelligence agencies, but entire populations. Beyond the control and manipulation of information flows, they exploit the cognitive biases of individuals, but also the potential of human-computer interfaces to influence and eventually deceive the population as a whole. Furthermore, CoW allows them to assess the impact of information and to study how it can be amplified.

- *2.2.2 Eight weak signals that do not deceive*

An emerging threat that needs to be analyzed with particular attention⁸⁶ (Reczkowski 2022), online cognitive warfare in Sub-Saharan Africa can be identified thanks to seven main weak signals proposed by Didier Bazalgette, director of the "cognitive warfare" project of the French National Research Agency:

1. **Increase in propaganda:** The sudden rise of disinformation and fake news on social networking platforms, especially during election periods, may indicate the use of

⁸⁵ "Mapping Disinformation in Africa", *Africa Center for Strategic Studies*, May 13, 2022, <https://africacenter.org/>.

⁸⁶ Reczkowski, 2022.

cognitive warfare tactics to influence public opinion and political outcomes. This is evidenced by the interventions of influencers on social networks and TV shows, which have been relaying and promoting Russian disinformation operations carried out in many Sub-Saharan countries since 2019, such as in Mali, Burkina Faso, CAR, Cameroon, South Africa or Mozambique⁸⁷.

2. **Targeted messages:** Any change in communication towards sensitive or vulnerable populations, such as religious or ethnic groups, may be indicative of efforts to conduct cognitive warfare aimed at creating social unrest and conflict. A report⁸⁸ entitled *The Factory of Division* and released in June 2017 revealed how the Gupta family-owned Oakbay Investments paid \$2 million to the British PR firm Bell Pottinger to orchestrate an operation⁸⁹ targeting South Africa's white business elite. In parallel, a second investigation⁹⁰ revealed transactions between subsidiaries of Gupta family companies and Ukrainian companies specializing in online disinformation. By generating more than 200,000 tweets, Eastern European troll farms have fueled racial animosity in the Rainbow Nation⁹¹.
3. **Increased polarization:** The significant increase in extremist views may indicate cognitive warfare tactics aimed at dividing and destabilizing societies. Two cases can be mentioned here:
 - a. In 2020 in the Democratic Republic of Congo, university students created fake accounts on social networks spreading inflammatory information for the benefit of Honoré Mvula and his political party to attract new followers. The 60 or so pages were deleted by Facebook because they passed off disinformation and political propaganda as news content⁹².
 - b. In 2021, in Tanzania, where democracy is in retreat, accounts linked to the ruling party coordinate conflicting reports to harass opposition and civil society leaders⁹³.
4. **Cyber-attacks:** The sudden increase in cyber-attacks on critical infrastructure or government systems, as well as the spread of malware or ransomware, may indicate the use of cognitive warfare tactics to disrupt key systems and cause chaos. For example, in Nigeria in 2022, accounts of authentic journalists and social network users on Twitter, Facebook and LinkedIn were hacked to post unauthorized Russian propaganda⁹⁴.
5. **Influence operations:** The use of covert influence operations, such as spreading rumors or bribing officials, can be a signal of cognitive warfare to manipulate decision-making processes and create instability. In 2019, private companies based in

⁸⁷. "Mapping Disinformation in Africa", *Africa Center for Strategic Studies*, May 13, 2022, <https://africacenter.org/>.

⁸⁸. This report was produced by the African Network of Investigative Journalists (ANCIR).

⁸⁹. This operation is called "White Capitalism Robs South Africans".

⁹⁰. Investigation conducted by the international collective of investigative journalists Bellingcat.

⁹¹. Amine Ater, "Afrique du Sud : l'affaire Gupta n'en finit pas de hanter la fin de mandat de Zuma", *La Tribune* online, June 9, 2017, <https://afrique.latribune.fr>.

⁹². "RDC : Facebook supprime une soixantaine de comptes liés à l'homme politique Honoré Mvula", *RFI* online, August 10, 2020, <https://www.rfi.fr/fr/afrique>.

⁹³. "Mapping Disinformation in Africa", *Africa Center for Strategic Studies*, May 13, 2022, <https://africacenter.org/>.

⁹⁴. Ibid. See attachment D.

Egypt and the United Arab Emirates posed as regional news organizations. In a context of competition between states in the Horn of Africa, they created and then disseminated false allegations attributing the terrorist attacks in Somalia to Qatar. The published pages had more than 13.7 million subscribers, mainly in North Africa and the Middle East⁹⁵.

6. **Discrediting opponents:** The use of online campaigns to discredit political opponents, civil society organizations and journalists, through assassination or smear campaigns, may indicate the use of cognitive warfare tactics to undermine democratic processes. In the 2019 elections in South Africa, a disinformation plan was drawn up by the firm AFRIC (known for its Russian connections) to discredit parties opposed to the ANC⁹⁶.
7. **The weaponization of information:** The use of information as a weapon to achieve political, strategic or military objectives can signal the use of cognitive warfare tactics. This includes the dissemination of false information to create fear and panic. In 2014, subsidiaries of the Wagner Group hired locals to produce disinformation about the Libyan conflict in order to promote Libyan warlord Khalifa Haftar⁹⁷.
8. Overall, it is important to be vigilant and monitor any sudden or significant changes in online behavior and messaging that may be an indication of the growing use of cognitive warfare in the region.

- *2.2.3 Destabilizing: the desired end state of cognitive online warfare*

With their growing influence in Sub-Saharan Africa, social networks, aided by more traditional channels such as radio and television, have become an essential part of the CoW orchestrated to create multi-level destabilization.

- ◆ *a) At the individual level*

The weak signals described and identified show that the cognitive war being waged online is changing not only what people think, but more importantly how they think and therefore how they act. Viewed as a new battlefield to be conquered and dominated, the brain is under attack from all sides⁹⁸. The growing dependence on the digital world within heterogeneous populations that are still too little concerned and aware of digital issues accentuates the flaws and weaknesses. Unknowingly, individuals behave according to the plans of those who manipulate them, be they state actors or not.

- ◆ *b) At the organizational level*

Moreover, the examples examined show that cognitive warfare encourages people to act in ways that can disrupt or fragment a seemingly cohesive society. The wide-ranging manipulations experienced by individuals and societies in Sub-Saharan Africa also reveal that this new mode of online warfare has no geographical or temporal boundaries. If, thanks to the

⁹⁵. Ibid. See attachment D.

⁹⁶. Ibid. See attachment D.

⁹⁷. Ibid. See attachment D.

⁹⁸ Ben Norton, "Behind NATO's 'cognitive warfare': 'Battle for your brain' waged by Western militaries", The Grayzone, October 8, 2021, <https://thegrayzone.com>.

Internet, the theater of cognitive warfare is global, its target is the human being as an individual and as a group: every brain and every heart, wherever they may be, are essential parts that can be permanently altered, shaped, and diverted in order to change their perceptions and their ways of acting. Like water droplets, whose amalgamation gives strength, they are also collectively shaped by new technologies to flow in the same direction with a more or less strong force. As Claverie and Cluzel analyze, CoW has no beginning and no end. It is a “conquest that knows no respite and that is punctuated by the notifications of our smartphones, anywhere, 24 hours a day, 7 days a week”⁹⁹. The most advanced form of manipulation to date, it aims to influence the behavior of a group of individuals in order to gain a tactical or strategic advantage (Raymond, 2022).

- *2.2.4 Cognitive warfare or the art of blurring the lines.*

The 23 disinformation campaigns in Africa referenced since 2014 by the Africa Center for Strategic Studies ([Appendix D](#)) illustrate a carefully conducted campaign to saturate online social spaces with intentionally false and misleading messages. Yet, this is only the tip of the iceberg: not all disinformation campaigns are recorded, hence the lack of a precise and complete picture for each country in the zone. Moreover, one of the best illustrations of this CoW in Francophone Sub-Saharan Africa is the study of propaganda videos¹⁰⁰, whose authorship is difficult to establish. Similar to the Russian mass media strategy used in Ukraine to undermine the legitimacy and public trust of the government of Volodymyr Zelensky, strong concepts are combined with shocking images and striking language in clips. These are then broadcast online to exacerbate existing tensions in already troubled contexts where there is strong anti-French sentiment. Playing on the feelings and anger of local populations, these videos presented in the form of infantilizing and Manichean cartoons take up the codes and aspirations of local societies. Everything is done to propose content that is easy to grasp, that arousing emotions, accentuates divisions and designates a scapegoat¹⁰¹, France: the demonization through the images invoked and their symbolism (rat, snake, hyenas, zombies, lion, protecting soldiers) has a strong cognitive effect on the population. The height of manipulation is that these videos are made in French.

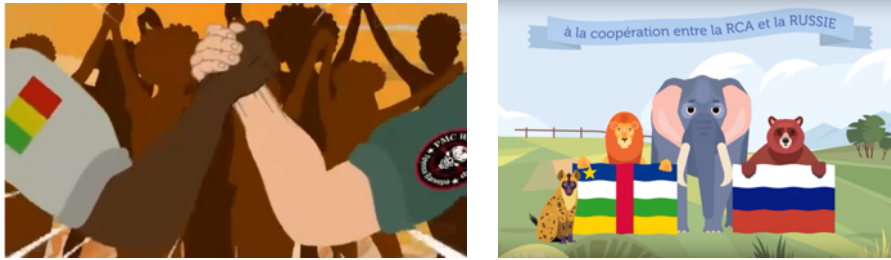


Some screenshots of France's representation

⁹⁹ David Pappalardo, *op. cit.*

¹⁰⁰. Links to the cartoons: "[LionBear](#)" video / "[Zombie Army](#)" video / "[Emmanuel the Rat](#)" video.

¹⁰¹. Alicia Mihami, “Vidéos anti-françaises en Afrique : Wagner est dans une approche prosélyte”, *TV5 Monde* online, January 19, 2023, <https://information.tv5monde.com>.



Some screenshots of Russian and Wagner representation

Although Russia, through the Wagner Group, is presented as a liberating and triumphant hero, there is no evidence to attribute these cartoons to it. Moreover, the traditional broadcasting spheres, as well as the anti-French networks in Africa, did not ensure their dissemination. While some analysts speak of a "false flag", others believe that it is more likely that these videos are the result of personal initiatives and that they then gained momentum through loops between WhatsApp groups. Finally, other experts from the collective All Eyes on Wagner argue that "external actors and their networks of influence" could be behind them, "such as Turkey or China".

2.3 Online entertainment, a game for both state and non-state actors

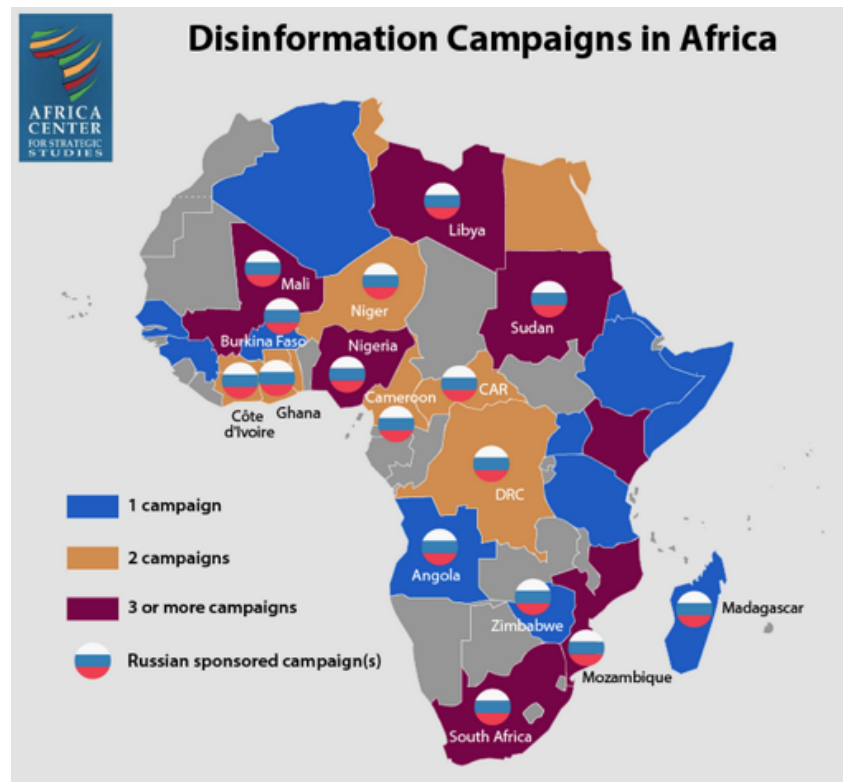
Sub-Saharan Africa is undeniably under the influence of state actors and their proxies seeking to advance their economic, ideological and political agendas. This is particularly true of Russia and China, the two extra-continental powers that appear to be the most active. While their presence has been increasing in many areas since the early 2000s, the forced and precipitous withdrawal of French troops from the Sahel-Saharan region (BSS) illustrates, in parallel, the growing and latent rejection of any form of cooperation with Western powers, which are seen as "extensions of historical colonialism and the dominant-dominated relationship"¹⁰². France has thus created opportunities for non-state actors, existing and new ones alike, act under the pretext of offering a more equitable collaboration than prior ones with France.

- *Russia, the forerunner and its proxy Wagner*

While Russia was the first to use disinformation to gain political influence in Africa, this model is now being replicated by other actors on the continent¹⁰³. Using the concept of "dezinformatsia" coined in the 1920s in Russia and redefined by Vladimir Putin in 2012, it was determined that at least sixteen operations relying on disinformation were carried out between 2014 and 2022.

¹⁰². "Les influences russes et chinoises sur le continent Africain", *Iremos*, November 29, 2022, <https://www.iremos.fr> & Langlois, Jean "Understanding African cultures and philosophies", *Training, Language and Culture* 3, no. 3 (2019): 21-35.

¹⁰³. "Mapping Disinformation in Africa", *Africa Center for Strategic Studies*, May 13, 2022, <https://africacenter.org/>.



Map of disinformation campaigns in Africa that have been detected and publicly documented¹⁰⁴

◆ *Russia's objectives*

Russia's various disinformation strategies observed in Sub-Saharan Africa have several objectives. They allow Russia:

- first, to acquire influence over territories that it considers strategic along the Mediterranean Sea. Indeed, Russia seeks above all to ensure its own security. Its presence on the African continent allows it to position itself as a major player in the South, to limit the areas where forces hostile to its regime are established and to directly confront the influence of the U.S. and the NATO alliance in the region.
- then, to show its military superiority and defend its legitimacy in the framework of the "special operation" in Ukraine. The virality of the #IStandWithPutin and #IStandWithRussia hashtags in South Africa, retweeted nearly 300,000 times a day between February 26 and March 1 2022, illustrates the effective realization of this ambition¹⁰⁵. The avalanche of messages of support for Russia was also seen in Mali, Burkina Faso, and Ivory Coast¹⁰⁶.
- to consolidate its historical position as a beneficent power by activating two levers:
 - the first lever is that of financial aid and arms deliveries that give it access to the exploitation of the region's natural resources.
 - the second lever, made possible by its status as a reliable and unwavering ally, is military support for African regimes or opposition groups that are

¹⁰⁴. *Idem*

¹⁰⁵. "Les faux comptes qui promeuvent la politique de Poutine dans le monde", *France Culture* online, May 24, 2022, <https://www.radiofrance.fr>.

¹⁰⁶. Gilles Cléménçon, "Les "trolls", prolétariat du numérique qui sème le trouble sur les réseaux sociaux", RTS online, April 29, 2022, <https://www.rts.ch/info/monde>.

sympathetic to it and subsequently become beholden to it. These diplomatic and military supports, accompanied by several arms deliveries, show that “the Central African Republic is becoming the model for Russia's multifaceted effort to gain influence in Africa”¹⁰⁷.

- finally, to undermine democracy. Supporting pro-Russian candidates through co-optation and denigrating the others, Russia manages, through subtle psychological actions, to make the public believe that there are few alternatives between the different political systems proposed and therefore no real advantage to living in democratic systems. This strategy¹⁰⁸ relies almost entirely on the influence of key individuals in power structures through coercion, personal reward and manipulation.

◆ *The various means used by Russia*

The Russians have understood that traditional Africa has mutated by entering the age of the masses: for Raphaël Chauvancy, the cognitive war they are waging is the opposite of the French operations in the Sahel, built around “Cartesian political and military actions against Islamist groups”¹⁰⁹.

◆ *The media*

First of all, Russian public media play a primordial role in Sub-Saharan Africa¹¹⁰: beyond the key outlets Russia Today (RT) and Sputnik, nearly “4,000 news sites republishing content from Kremlin-sponsored media”¹¹¹ were listed in the study “Russian medias and Africa: exercising soft power”¹¹² by the South African Institute of International Affairs (SAIIA).

¹⁰⁷. Daniel Munday, “Russian Mercenaries in the Central African Republic create problems for Democratic actors”, LSE, May 5, 2021, <http://eprints.lse.ac.uk>.

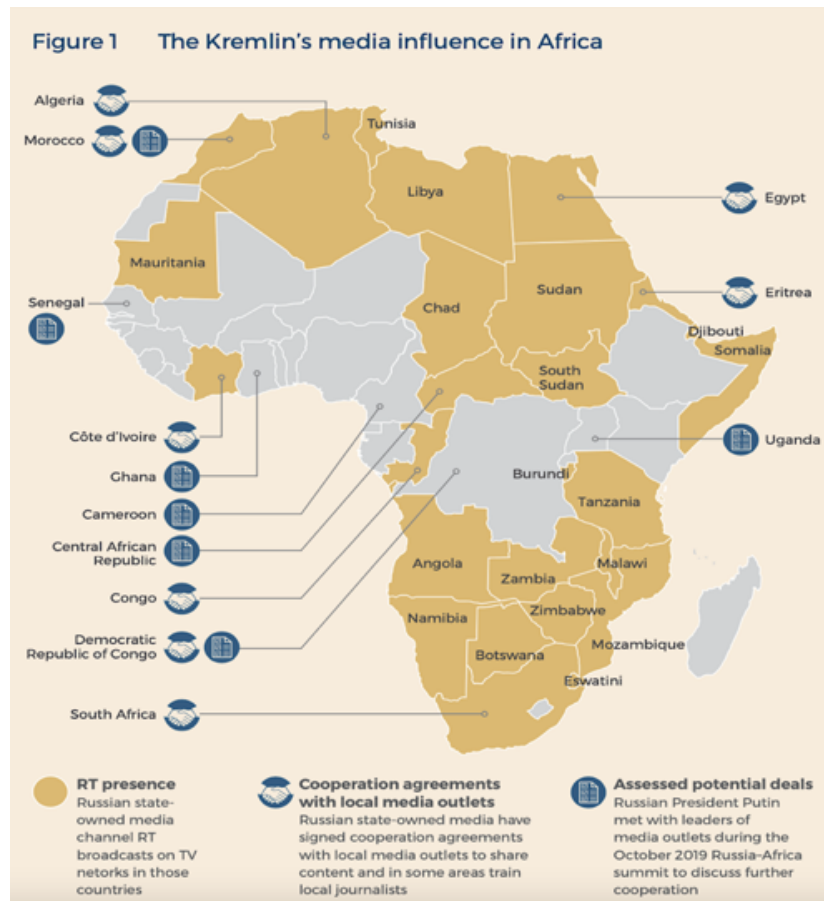
¹⁰⁸. Iremos, November 29, 2022, <https://www.iremos.fr/>.

¹⁰⁹. Raphaël Chauvancy, “Guerre psychologique en Afrique, le dessous des manipulations russes”, Theatrum Belli, October 27, 2022, <https://theatrum-belli.com/guerre-psychologique-en-afrique-le-dessous-des-manipulations-russes/>.

¹¹⁰. Nataliya Bugayova et al., “The Kremlin’s Inroads after the Africa Summit”, Institute for the Study of War (Washington, D.C.), November 08, 2019, <https://www.understandingwar.org/backgrounder/kremlins-inroads-after-africa-summit>.

¹¹¹. Servan Ahougnon, “Comment la Russie utilise les médias et les réseaux sociaux pour étendre son influence en Afrique”, *Agence Ecofin* online, June 07, 2022, <https://www.agenceecofin.com>.

¹¹². “Russian medias and Africa : exercising soft power”, SAIIA, February 2022, <https://saiia.org.za>.



The influence of Russian media in Africa¹¹³

◆ *The social networks*

Although they have their own platforms such as VKontakte, Telegram, Odnoklassniki or Moy Mir, the Russians prefer to use social networks that are already well established in Africa to influence and destabilize the continent. Generally, Russian disinformation is multidimensional and hybrid, mixing media, social networks and various messaging channels. This is evidenced by the coordinated campaign of false and misleading messages that appeared on Twitter, Tik Tok, Telegram, WhatsApp, and Facebook in 2021 in Mali, spreading anti-French, anti-UN, and pro-Russian messages simultaneously¹¹⁴.

◆ *Troll factories*

Relying also on troll factories spread across the continent, where employees produce content to flood newspapers and well-targeted social networks such as Twitter or Facebook¹¹⁵, Russia uses African click workers *en masse* to turn them into a form of "digital proletariat". The aim is clearly "to corrupt the debates and to sully the content published by established media,

¹¹³. Nataliya Bugayova et al., "The Kremlin's Inroads after the Africa Summit", Institute for the Study of War (Washington, D.C.), November 08, 2019, <https://www.understandingwar.org/backgrounders/kremlins-inroads-after-africa-summit>.

¹¹⁴. "Mapping Disinformation in Africa", *Africa Center for Strategic Studies*, May 13, 2022, <https://africacenter.org/>.

¹¹⁵. François Stéphane, "Désinformation", *Publicationnaire*, last modified January 19, 2023, <http://publicationnaire.huma-num.fr/notice/desinformation/>.

which do a journalistic job", analyzes Julien Nocetti, associate researcher at the French Institute of International Relations and specialist in Russia and the information wars. In addition, Sub-Saharan Africa is proving to be a breeding ground for increasingly sophisticated trolls: the use of artificial intelligence to create known faces ([deepfake](#)) that do not exist can also accentuate the spread of pro-Russian messages. For example, in December 2021, the video of a TV news anchor created from scratch using the free website Synthesia was broadcast from the Facebook page "Nabi Malien Den Halala". Openly pro-Russian and with more than 82,000 followers, the account had already popularized a fake video of French philosopher Bernard-Henri Lévy accusing him of giving information to jihadists about Malian army positions. Claiming that France gave money to various Malian political parties ahead of the May 24, 2021 coup, this new deepfake video also relies on a misrepresented letter allegedly attributed to President Emmanuel Macron¹¹⁶.

◆ *The Wagner Group, a private military company*

Another tool favored by African governments because of their weak institutions, Wagner has been active in the region since 2018. While the group is now officially present in nearly 17 African countries, including former colonies, it is the "instrument of war" that allows Russia to fight terrorist groups, protect certain mining sites, supply weapons, support armies in their various missions, and above all, conduct disinformation campaigns demonizing the West.

• *China, the one that "moves forward masked"*

When we think of China in Sub-Saharan Africa, we think of infrastructure, military bases or cultural partnerships, but not necessarily social networks. From Chinese soft power aimed at consolidating the influence of the Chinese Communist Party (CCP) in the world, Beijing's hegemonic ambition has been affirmed over the last ten years. Influence operations carried out in the name of the United Front¹¹⁷ aim at a "non-kinetic form of conflictuality aimed at winning without fighting, by shaping an environment favorable to China."¹¹⁸

The Ichikowitz Family Foundation revealed that 76% of 4,507 young Africans in 15 countries named China as a foreign power with a positive influence on their lives, compared to 72% for the U.S.¹¹⁹

◆ *China's early influence in Africa*

Chinese influence in Africa begins with an economic presence thanks to pharaonic investments and very powerful soft power¹²⁰. The 2021 report¹²¹ of the Strategic Research

¹¹⁶. Catherine Bennett, "Fake videos using robotic voices and deepfakes circulate in Mali", *France 24* online, January 10, 2022, <https://observers.france24.com/en/tv-shows/truth-or-fake/20220110-truth-or-fake-debunked-mali-robot-voices-deepfakes>.

¹¹⁷. The CCP's policy consisting of eliminating its internal and external enemies, controlling groups that may challenge its authority, building a coalition around the Party to serve its interests, and projecting its influence abroad.

¹¹⁸. Paul Charon, Jean-Baptiste Jeangène Vilmer, "Les opérations d'influence chinoises. Un moment machiavélien", *IRSEM*, October 2021, <https://www.irsem.fr/rapport.html>.

¹¹⁹. "Washington attaque la Chine sur la scène africaine", *Chine Magazine*, July 30, 2022, <https://www.chine-magazine.com/washington-attaque-la-chine-sur-la-scene-africaine/>.

¹²⁰. Iremos, November 29, 2022, <https://www.iremos.fr/>.

¹²¹. Paul Charon, *op. cit.*

Institute of the Military School (IRSEM) on Chinese influence operations reveals that during the last 50 years, Chinese or China-linked companies have built or renovated 186 government buildings in Africa, notably in Namibia, Angola, Ghana and Uganda. These include 24 presidential and prime ministerial palaces, sensitive government telecommunications networks and the computer equipment of 35 African governments.

Beijing is seeking to expand through growing strategic activities: the Belt and Road Initiative (BRI), which justifies the shift to hard power, and Chinese military commitments in Africa (participation in UN missions, training, port infrastructure and maritime maneuvers in African seas). Moreover, China has deliberately aligned its goals with African desires: the BRI unsurprisingly aligns with the African Union's (AU) agenda for infrastructure development in Africa. Revelations in 2018¹²² further demonstrated that the Chinese-built African Union headquarters in Addis Ababa had been rigged with microphones and computers equipped with spy systems.

From a cultural perspective, the Chinese Academy of Social Sciences oversees several institutional arrangements between Chinese and African think tanks. As a non-traditional foreign policy tool for youth, Confucius Institutes¹²³ are growing steadily, with 61 active institutes and 44 language labs (Confucius Classrooms) in 46 African countries as of 2020¹²⁴. As propaganda bodies, the institutes are coordination platforms for the dissemination of Chinese discourse¹²⁵.

◆ *Technologies in the service of Chinese influence*

China is present in some 40 African countries and provides more than half of the continent 4G network, optical fiber and data centers. China's smart cities and surveillance technologies are attracting many African political leaders, such as the president of Zimbabwe who has introduced a facial recognition program¹²⁶. These investments are but the tip of the iceberg. "African elites benefit monetarily and strengthen their networks of influence, while Chinese companies benefit by increasing their political clout."¹²⁷ Indeed, these technologies meet defined political objectives: control of the Internet, monitoring of user behavior, installation

¹²². John Aglionby, Emily Feng, Yuan Yang, "African Union Accuses China of Hacking Headquarters", *Financial Times* online, January 29, 2018, <https://www.ft.com/content/c26a9214-04f2-11e8-9650-9c0ad2d7c5b5>.

¹²³. Joint ventures between Chinese and foreign universities, funded by the Chinese Ministry of Education to promote Chinese language and culture and sponsor academic exchanges.

¹²⁴. Jean-Pierre Cabestan et al, "Les influences chinoises en Afrique. 1. Les outils politiques et diplomatiques du « grand pays en développement », *Études de l'IFRI*, IFRI, November 2021, <https://www.ifri.org/fr/publications/etudes-de-lifri/influences-chinoises-afrique-1-outils-politiques-diplomatiques-grand>.

¹²⁵. Zhao Alexandre Huang, "L'institut Confucius et la diplomatie publique chinois en Afrique : un organe de propagande déguisée en ONG ?", HERMES (France) no.89, CNRS Editions, June 2022, https://www.researchgate.net/publication/361369935_L%27Institut_Confucius_et_la_diplomatie_publice_chinoise_en_Afrique_un_organe_de_propagande_deguisee_en_ONG_The_Confucius_Institute_and_Chinese_public_diplomacy_in_Africa_a_propaganda_agency_masqueradi.

¹²⁶. Julie Montcouquiol, "L'offensive chinoise avec les villes numériques", *Ecole de Guerre Economique*, March 18, 2022, <https://www.egge.fr/infoguerre/loffensive-chinoise-avec-les-villes-numeriques>.

¹²⁷. Paul Nantulya, "Guānxì : pouvoir, réseautage et influence au sein des relations sino-africaines", *Africa Center for Strategic Studies*, December 20, 2021, <https://africacenter.org/fr/spotlight/guanxi-pouvoir-reseautage-et-influence-au-sein-des-relations-sino-africaines/>.

of surveillance cameras in public spaces, deployment of facial recognition systems¹²⁸. Huawei is already present in ten Sub-Saharan African countries.

According to the report "Cyber Operations Enabling Expansive Digital Authoritarianism"¹²⁹ produced by the Office of the Director of National Intelligence, Beijing is using its control over Chinese companies abroad to collect data on a massive scale. According to the report, "Beijing will be able to exploit the expanding telecommunications infrastructure and digital services of Chinese companies, the growing presence of these companies in the daily lives of people around the world, and China's growing global economic and political influence."¹³⁰ TikTok has been recently banned by several U.S. federal agencies as it is considered a threat to national security.¹³¹

◆ *Chinese media implementation*

"The major Chinese media have a global presence, in several languages, on several continents, and on all social networks, including those blocked in China (Twitter, Facebook, YouTube, Instagram), and they invest a lot of money to artificially amplify their online audience."¹³²

One of Beijing's explicit goals is to establish a new world media order by amplifying their presence on social networks, even if it means artificially inflating the number of subscribers¹³³. The first media building built in Dakar in 2015 houses RCI Senegal and CGTN French with local journalists. For example, the largest number of Chinese media relay sites are in Guinea, Senegal, Algeria, Morocco, Ivory Coast and Benin, and the most visited relay sites are in Ivory Coast, Morocco, Tunisia and Niger.¹³⁴

Beijing even takes stakes in local media groups to intervene, if necessary, regarding content. For example, in South Africa, the China International Television Corporation, in association with the China-Africa Development Fund (CADF), obtained in 2013 a 20% stake in the country's second largest independent press group, Independent Media,¹³⁵ which censored

¹²⁸. Sarah Vennen, "Cyber-colonialisme : comment le régime de techno-surveillance chinois s'impose au Zimbabwe", LVSL, February 14, 2021, <https://lvsl.fr/cyber-colonialisme-comment-le-regime-de-techno-surveillance-chinois-simpose-au-zimbabwe/>.

¹²⁹. NICA "Cyber operations Enabling Expansive Digital Authoritarianism", NICA 2020-027, April 7, 2020, <https://www.dni.gov/index.php/newsroom/reports-publications/reports-publications-2022/item/2334-cyber-operations-enabling-expansive-digital-authoritarianism>.

¹³⁰. *Idem*

¹³¹. "États-Unis : les agences fédérales sommées de bannir TikTok", *Le Point* online, February 28, 2023, https://www.lepoint.fr/monde/etats-unis-les-agences-federales-sommees-de-bannir-tiktok-28-02-2023-2510265_24.php#11.

¹³². Paul Charon, Jean-Baptiste Jeangène Vilmer, "Les opérations d'influence chinoises. Un moment machiavélien", IRSEM, October 2021, <https://www.irsem.fr/rapport.html>.

¹³³. "Pékin et les médias africains : le soft power chinois en marche. Entretien avec Selma Mihoubi", *Conflits* online, June 14, 2022, <https://www.revueconflits.com/pekin-et-les-medias-africains-le-soft-power-chinois-en-marche-entretien-avec-selma-mihoubi/>.

¹³⁴. Frédéric Douzet, Kevin Limonier, Selma Mihoubi, Élodie René, "Cartographier la propagation des contenus russes et chinois sur le web africain francophone", *Hérodote* no.177-178, 2020/2, p86, <https://www.herodote.org/spip.php?article943>.

¹³⁵. Selma Mihoubi, "Quand les médias chinois s'exportent en Afrique", *La revue des médias - INA*, last modified May 21, 2021, <https://larevuedesmedias.ina.fr/chine-afrique-influence-medias-covid-19>.

articles, including a column denouncing the persecution of the Uighur Muslim minority in China as reported by the NGO Reporters Without Borders.¹³⁶

◆ *The social networks*

Despite having their own platforms such as WeChat, Weibo, Douyin, Zhihu or XiaoHongShu, the Chinese prefer to use social networks that are already well established in Africa to influence and manipulate. Mixing media, social networks and various messaging channels, the disinformation carried out by the Chinese is multidimensional and relies on the excessive repetition of information.

This is evidenced by the coordination via the Spamoufagle Dragon¹³⁷ network using fake accounts and faces generated by AI, YouTube, Facebook, Twitter, TikTok accounts that have enabled various operations to target pro-democrats in Hong Kong, critics of the Chinese government and the Trump administration's foreign policy during the Coronavirus outbreak.¹³⁸

On social networks, China uses fake accounts to spread its pro-Chinese messages via YouTube, Facebook, Twitter, and TikTok, platforms that are nonetheless banned there. It should be noted that unlike Russia, most of the information relayed is not very elaborate and easily identifiable. Their impact depends on their repetition, which can create an "illusory truth effect"¹³⁹.

◆ *The Chinese troll factory*

To spread its propaganda on social networks, China uses thousands of fake accounts according to ProPublica's analysis¹⁴⁰, trolls and astrosurfing to simulate a spontaneous popular movement. Tens of billions of yuan are invested; but above all, nearly 22 million people, wrongly called the "50 cent army", are requisitioned to serve Beijing's interests.

In addition to pro-Chinese propaganda, these accounts also act to degrade other models of liberal democracy, as does Russia. Usually controlled by the PLA (People's Liberation Army) or the CYL (Communist Youth League), trolls defend, attack, maintain polemics, insult and harass¹⁴¹. These trolls made virulent appearances during the Coronavirus pandemic and continue their "diplomatic trolling". Twitter locked the official account of the Chinese

¹³⁶. "Afrique du Sud: un journaliste perd sa chronique suite à un article critique sur la Chine", *Reporters sans frontières*, September 21, 2018, <https://rsf.org/fr/afrique-du-sud-un-journaliste-perd-sa-chronique-suite-%C3%A0-un-article-critique-sur-la-chine>.

¹³⁷. Paul Charon, Jean-Baptiste Jeangène Vilmer, "Les opérations d'influence chinoises. Un moment machiavélien", *IRSEM*, October 2021, p279, <https://www.irsem.fr/rapport.html>.

¹³⁸. Paul Charon, *IRSEM*, *op. cit.*

¹³⁹. Paul Charon, *IRSEM*, *op. cit.*

¹⁴⁰. Jeff Kao, ProPublica and Mia Shuang Li, "How China Built a Twitter Propaganda Machine Then Let It Loose on Coronavirus", *ProPublica*, March 26, 2020, <https://www.propublica.org/article/how-china-built-a-twitter-propaganda-machine-then-let-it-loose-on-coronavirus>.

¹⁴¹. Liza Lin, « A U.S. Diplomat's Wife Was a Social Media Star – Until Chinese Trolls, Aided by State Media, Came After Her; Tzu-i Chuang was referred to as the 'most famous diplomatic wife' before she became the target of avicious, monthslong attack on social media », *The Wall Street Journal* online, March 29, 2021, <https://www.wsj.com/articles/a-u-s-diplomats-wife-was-a-social-media-staruntil-chinese-trolls-aided-by-state-media-came-after-her-11617015601>.

Embassy in the United States in January 2021 after a tweet describing Uyghur women as "baby-making machines".

They also get third parties to publish content for money via content farms such as KanWatch, Big Durian or beeper.live, the purchase of a one-off post, influence on an account or page, or the recruitment of an influencer or streamer¹⁴². The Youtubers *SerpentZA* (South African) and *laowhy86* (American) are among the most watched on the subject of China, have been living in China for more than ten years and are married to Chinese women, have been offered money to minimize their Western comments against Chinese policy, for example, with regard to Tibet.

"Unlike Russian media, Chinese agencies remain focused on broadcasting the official word of the Chinese regime, without adapting to issues or controversies of local interest, which severely limits their popularity and thus their spread in Africa."¹⁴³

- *Turkey*

Like other countries, Turkey is interested in strengthening its relations with African countries because of the attractive economic resources in West Africa in particular. Turkey is seeking to develop partnerships beyond North Africa. It has one of the densest diplomatic networks with 43 embassies in Africa (53 for China and 40 for Russia)¹⁴⁴ and Turkish Airlines is the foreign airline with the most destinations on the continent: 62 destinations in 41 African countries¹⁴⁵ including 31 Sub-Saharan African countries¹⁴⁶.

As an increasingly important military player, Turkey has become a major arms dealer in Africa. Researcher Ali Bakir¹⁴⁷ explained in 2022 that "Turkish defense exports to Africa are totally unprecedented in terms of quantity, quality, value and scope"¹⁴⁸ after years of persistent effort.

¹⁴². The streamer is a person who broadcasts live content to an audience on different topics. The most popular content being video games. This is done using a camera and a streaming platform such as Twitch. The objective of his videos is to transmit his passion and knowledge to as many people as possible. The streaming videos are broadcasted live. It is therefore impossible to cut or edit certain scenes. This brings a certain level of authenticity to this type of content.

¹⁴³. Frédérick Douzet, Kévin Limonier, Selma Mihoubi, Élodie René, « Cartographier la propagation des contenus russes et chinois sur le web africain francophone », *Hérodote* no.177-178, 2020/2, p97, <https://www.herodote.org/spip.php?article943>.

¹⁴⁴. Embassy Pages, last modified February 28, 2023, <https://www.embassypages.com/>

¹⁴⁵. Nelly Fualdes, "Aérien : pourquoi Turkish Airlines parie sur les gros-porteurs en Afrique", October 21, 2022, <https://www.jeuneafrique.com/1383275/economie/turkish-airlines-se-pose-en-leader-de-la-connectivite-en-afrique/>.

¹⁴⁶. Turkish Airlines flight destinations, last modified February 2023, <https://www.turkishairlines.com/fr-int/flight-destinations/>

¹⁴⁷. Non-resident Senior Fellow at the Atlantic Council think tank at the Atlantic Council think tank and adjunct professor at the Ibn Khaldun Center at Qatar University.

¹⁴⁸. Paul Iddon, "Why African countries are lining up to buy Turkey's weapons", November 16, 2022, <https://www.middleeasteye.net/news/why-african-countries-are-lining-up-to-buy-turkeys-weapons>.

As a major stake in its foreign policy, Turkey has placed the media at the heart of its soft power strategy for the past ten years since Erdogan came to power¹⁴⁹. Propaganda, using all media outlets in the pay of the AKP (Justice and Development Party)¹⁵⁰, is both for domestic use and for African countries to accompany Turkey's ever-stronger presence. Ankara also relies on African countries to carry out disinformation actions against its rivals.

◆ *Social networks and troll army*

The Turkish government encourages the use of local networks such as BiP, where official communiqués have been published since 2021¹⁵¹. Facebook, Twitter, Instagram, YouTube, Telegram and TikTok are the preferred networks in Turkey, as in Western countries, but their control is increasingly reinforced by the state.

Turkey is very much on the cutting edge of disinformation on social networks. In January 2022, Kemal Kılıçdaroğlu¹⁵², the leader of the Turkish opposition, announced that he had discovered "a gigantic network of trolls paid for by the public power"¹⁵³ after conducting a parliamentary investigation¹⁵⁴. In addition, the Turkish government has been working on a number of social networking sites. According to the NGO Freedom House's annual Freedom on the Net reports¹⁵⁵, the AKP has hired an army of trolls, the AK Trolls, to manipulate online discussions and combat criticism of the government on social networks¹⁵⁶. As many as 6,000 individuals were reportedly hired as early as 2013 for the Turkey Digital Office to thwart anti-AKP protests related to corruption scandals. These trolls use a variety of means ranging from propaganda to hacking accounts, as during the 2017 referendum¹⁵⁷ or [astroturfing](#). They either pose as political figures to legitimize disinformation campaigns¹⁵⁸ or attack independent

¹⁴⁹. Servan Ahougnon, "Pour la Turquie, les médias seront l'outil central de son soft power en Afrique", *Agence Ecofin*, June 7, 2022, <https://www.agenceecofin.com/communication/0706-98446-pour-la-turquie-les-medias-seront-l-outil-central-de-son-soft-power-en-afrique>.

¹⁵⁰. Adalet ve Kalkınma Partisi.

¹⁵¹. Guillaume Perrier, "En Turquie, la mise au pas des réseaux sociaux", *Le Point International* online, January 14, 2021, https://www.lepoint.fr/monde/en-turquie-la-mise-au-pas-des-reseaux-sociaux-14-01-2021-2409595_24.php.

¹⁵². Kemal Kılıçdaroğlu, Twitter, January 30, 2022, Video, 6:50, <https://twitter.com/kilicdaroglu/status/1487848129844203527>.

¹⁵³. Emilie Bouvier, "Les 'AK Trolls' : une armée digitale au service des intérêts politiques du pouvoir turc", *Les Clés du Moyen-Orient*, last modified December 02, 2022, <https://www.lesclesdumoyenorient.com/Les-AK-Trolls-une-armee-digitale-au-service-des-interets-politiques-du-pouvoir.html#nb1>. <https://twitter.com/kilicdaroglu/status/1487848129844203527>.

¹⁵⁴. "Freedom on the Net 2022 - Turkey Country Report", *Freedom House*, 2022, <https://freedomhouse.org/country/turkey/freedom-net/2022>.

¹⁵⁵. Dion Nissebaum, "Before Turkish Coup, President's Drive to Stifle Dissent Sowed Unrest," *The Wall Street Journal*; <https://www.wsj.com/articles/before-turkish-coup-presidents-drive-to-stifle-dissent-sowed-unrest-1468632017>;

"CHP asks if pro-gov't trolls put on AK Party payroll," *Cihan*, September 4, 2014, <https://www.thefreelibrary.com/CHP+asks+if+pro-gov%27t+trolls+put+on+AK+Party+payroll.-a0381431042>.

¹⁵⁶. "Des comptes Twitter piratés en masse par des pro-Erdogan", *RFI*, last modified March 15, 2017, <https://www.rfi.fr/fr/technologies/20170315-twitter-counter-pirates-pro-erdogan-turquie-pays-bas-allemande>.

¹⁵⁷. "Des comptes Twitter piratés en masse par des pro-Erdogan", *RFI*, March 15, 2017, <https://www.rfi.fr/fr/technologies/20170315-twitter-counter-pirates-pro-erdogan-turquie-pays-bas-allemande>.

¹⁵⁸. "New report details role of Erdoğan's troll army in Turkey's democratic backsliding," *Stockholm Center for Freedom*, August 5, 2021, <https://stockholmcfr.org/new-report-details-role-of-erdogans-troll-army-in-turkeys-democratic-backsliding/>.

human rights media by massively organizing on messaging channels such as Telegram or Facebook¹⁵⁹. In 2020, Operation *Ebabil* announced that it had successfully restricted the Twitter account of the chairman of the main opposition party, Canan Kaftancıoğlu¹⁶⁰.

A related example shows how Turkey does not hesitate to disseminate false images to promote its operations, such as during its intervention in Afrin in Syria in 2018. The video below does not show Turkish pilots at all but rather Dutch fighter jets flying over Amsterdam at the coronation of the Dutch king in April 2013.



Screenshot of a Facebook video purporting to show the Turkish military intervention in Afrin, northwestern Syria in 2018.¹⁶¹

◆ *French bashing to get a better foothold*

Ankara's rapprochement with the countries of the Sahel region indicates that Turkish interests there are not only economic. To impose its soft power in Sub-Saharan Africa, Turkey has waged a counter-influence campaign against France by criticizing its interference in West Africa and the Sahel region. "Through the Anadolu Agency (AA), Turkey targets French operations. Anadolu Agency is a pro-Erdogan media outlet that enjoys good influence in West African countries."¹⁶² In 2017, while France and the United States were supporting Kurdish fighters against the Islamic State, AA had revealed the positions of French and American special forces in northern Syria¹⁶³.

¹⁵⁹. Erk Acarer, "Pelikan'a rakip: Ebabil Harekâtı [Operation Ebabil: Competitor to Pelikan]," *Birgün Newspaper*, May 23, 2020, <https://www.birgun.net/haber/pelikan-a-rakip-ebabil-harekati-302021>.

¹⁶⁰. "Kısıtlanan hesabı aktif edilen Kaftancıoğlu'ndan 'Ebabil' göndermesi [After her restricted profile is re-activated, Kaftancıoğlu points to 'Ebabil']," *Cumhuriyet*, May 20, 2020, <https://www.cumhuriyet.com.tr/haber/kisitlanan-hesabi-aktif-edilen-kaftancioglundan-ebabil-gondermesi-1740077>.

¹⁶¹. "Le vrai du faux. Non, ces images ne sont pas celles d'une opération turque à Afrin en Syrie", *Franceinfo*, February 02, 2018, https://www.francetvinfo.fr/replay-radio/le-vrai-du-faux/le-vrai-du-faux-non-ces-images-ne-sont-pas-celles-d-une-operation-turque-a-afrin-en-syrie_2568651.html.

¹⁶². Armand Pivot, "La pression turque en Afrique de l'Ouest", *Ecole de Guerre Economique*, November 5, 2021, <https://www.egc.fr/infoguerre/la-pression-turque-en-afrique-de-louest>.

¹⁶³. "L'agence turque Anadolu révèle l'emplacement de troupes américaines et françaises en Syrie", *France 24 (AFP)*, July 20, 2017, <https://www.france24.com/fr/20170720-anadolu-turquie-ankara-localisation-troupes-americaines-francaises-coalition-syrie>.

"Turkey is using stories between West African countries and France to counter the tricolor positions. The informational attack on neo-colonialism groups politicians and population groups on this French sentiment. By relying on this heavy past, Ankara feeds the colonial perception in the eyes of Africans."¹⁶⁴

Turkey also plays on the religious factor to manipulate the cognitive bias against France: following the assassination of French teacher Samuel Paty in October 2020 for showing Mohammed cartoons to his class, the High Islamic Council of Mali showed its disagreement with France and its complicity with Turkey by launching anti-French demonstrations.¹⁶⁵

The French president denounced in November 2020¹⁶⁶ the Chinese, Russian and Turkish strategies to fuel anti-French sentiment in Africa. The permanent French bashing, via accounts that could be linked to Turkey or its diaspora, were spreading fake news and stirring up hatred of France in Africa, thus serving as Turkish weaponry in Sub-Saharan Africa.



Screenshots of the twitter account "Yigal Emmanuel". On the left, about the visit of the French CEMAT to Mali at the end of 2020; in the middle a flurry of anti-France tweets; and on the right a comment related to the Turkish diaspora in France¹⁶⁷

In order to put down its competitors, Erdogan's Turkey spreads disinformation via its propagandist press organs, a network of militants in Turkey and Europe, and on social networks via armies of trolls copying the Russian model and exploiting the flaws of Western

¹⁶⁴. Armand Pivot, *op. cit.*

¹⁶⁵. "Caricatures. Colère d'Erdogan, les Maliens manifestent, la France réclame des sanctions", Ouest France (AFP), October 28, 2020, <https://www.ouest-france.fr/charlie-hebdo/caricatures-colere-d-erdogan-les-maliens-manifestent-la-france-reclame-des-sanctions-7032892>.

¹⁶⁶. "Emmanuel Macron accuse Turquie et Russie d'alimenter une campagne antifranaise en Afrique", TF1info, November 20, 2020, <https://www.tf1info.fr/politique/emmanuel-macron-accuse-turquie-et-russie-d-alimenter-une-campagne-antifranaise-en-afrique-2170655.html>.

¹⁶⁷. Jean-Marc Lahaie, "La Turquie en Afrique de l'Ouest, en particulier au Sénégal", EMSOME, April 2021, https://www.emsome.terre.defense.gouv.fr/images/documents/bibliotheque/memoire_ome/EFS_-La_Turquie_en_Afrique_de_lOuest_en_particulier_a_Senegal_-_Cne_LAHAIE.pdf.

actors. These strategies seem to work in West Africa¹⁶⁸. Nevertheless, Turkey is struggling to export itself religiously, culturally, and linguistically, as in Senegal, its culture and language being too foreign-seeming.

- *Non-state actors: online cognitive propaganda among terrorists networks*

Terrorist groups are increasingly using online propaganda as a tool to promote their goals and recruit new members. This is also true in Africa, where a number of terrorist groups have been active in conducting cognitive propaganda operations online. Boko Haram, Al-Shabaab, and Islamic State of Iraq and Syria (ISIS) use online cognitive propaganda to achieve their goals in Africa.

Boko Haram operates primarily in Nigeria. **Al-Shabaab** operates in Somalia but also in neighboring countries such as Kenya and Uganda. **ISIS in Africa** has a presence in several African countries including Libya, Egypt, and Nigeria with its Islamic State's West Africa Province (ISWAP) branch also operating in Niger and Chad.

Boko Haram, Al-Shabaab and ISIS in Africa have used online propaganda to recruit new members and justify their attacks. They have all created media wings – respectively al-Urwa al-Wuthqa, al-Kataib and al-Hayat – that produce videos and other propaganda materials promoting their group's ideology and activities. The groups also use social media platforms to spread propaganda messages and communicate with potential recruits. Their online propaganda often promotes the concept of jihad and portrays group members as heroes and martyrs.

ISIS in Africa has used online propaganda to massively recruit new members and promote its activities in Africa. ISIS in Africa media wing, al-Hayat, mass-produces videos and other propaganda materials of great diversity (recordings, videos, [nasheeds](#), posters, infographics, press releases, magazines, weekly letters) that promote the group's ideology and activities translated systematically and sometimes into more than 15 languages (such as the Rumiya magazine). They also use music like this song in French "Crie de tout ton cœur vengeance" [Cry out with all your heart for revenge]. ISIS online propaganda in Africa often emphasizes the concept of jihad and portrays group members as heroes and martyrs.

Governments and security agencies have taken steps to counter these propagandas, including disrupting online networks, countering extremist narratives, monitoring online activity, and promoting education¹⁶⁹.

¹⁶⁸. Jean-Marc Lahaie, *op. cit.*

¹⁶⁹. Marc-Olivier Boisset, Jean Langlois. An analysis of the Pegasus case: Rise of cyber threats. CRSI, 2021, [hal-04179574](#)

3. Gaming and the metaverse: future threat sanctuaries

Online cognitive warfare in Sub-Saharan Africa has so far been conducted via social networks. However, a new area of digital entertainment, that of video games and the metaverse, seems to be a particularly favorable breeding ground in this war. It therefore deserves to be closely monitored owing to its potential for future risks and threats.

In order to identify these risks and threats, our analysis in this final section will be based on strategic anticipation (in the short term) and predictive analysis (in the long term) based on concrete examples, some of which lie beyond the African continent.

3.1 Forecast trends in Sub-Saharan Africa

Beyond the uneven developments in the digital domain addressed in Part 1 and the problems of sovereignty noted in Part 2, the emergence of CoW reveals a lack of anticipation and legislation within the States of the region studied, deficiencies in terms of investment and financing, as well as delays in education and training.

- *3.1.1 The video game market in Sub-Saharan Africa: the new Eldorado?*

- ◆ *a) The Africanization of the gaming industry*

With the gradual improvement of Internet access, the growing popularity of online entertainment and the 50% increase in young people in Africa by 2050¹⁷⁰, the gaming market in Sub-Saharan Africa is expected to grow significantly in the coming years: the compound annual growth rate (CAGR), estimated at 12% for the period 2021-2026¹⁷¹, makes it possible to envision an “Africanization of the gaming industry”¹⁷². The total revenues of the global games market could be multiplied by 1.5 by 2025 going from \$862.8 million in 2022 to \$1,254.4 million in 2025.¹⁷³ While this is still in its infancy, Eveline Honla, head of marketing growth at Kiro'o Games, recalls “it is [nonetheless] a niche ecosystem that we are trying to grow to become a real industry”¹⁷⁴.

Over the last decade, dozens of video game production studios, mostly in English-speaking countries¹⁷⁵, have entered the market. In South Africa (11 million players / estimated market of \$290 million in 2021), Nigeria, Ghana, Kenya, and Ethiopia (with an estimated market of \$35 million), to name a few. The most famous studios are Kucheza, Kagiso Interactive, Nyamakop, Celestial Games, Kuluya, the French-based studio Maseka Games and the Pan Africa Gaming Group (PAGG), a collective of ten French- and English-speaking studios united in 2022 to facilitate the creation of “100% African video games”¹⁷⁶. At the same time,

¹⁷⁰. Mordor Intelligence, *op.cit.*

¹⁷¹. *Ibid.*

¹⁷². “L’industrie des jeux vidéo en Afrique, perspectives d’avenir”, *Le Journal 2 l’Afrique*, April 20, 2021, <https://lejournaldelafrique.com/lindustrie-des-jeux-video-en-afrique-perspectives-davenir/>.

¹⁷³. “State of the African Games Industry 2023”, Games Industry Africa, January 23, 2023, <https://gamesindustryafrica.com/2023/01/23/state-of-the-african-games-industry-2023/>.

¹⁷⁴. Marine Jeannin, *op. cit.*

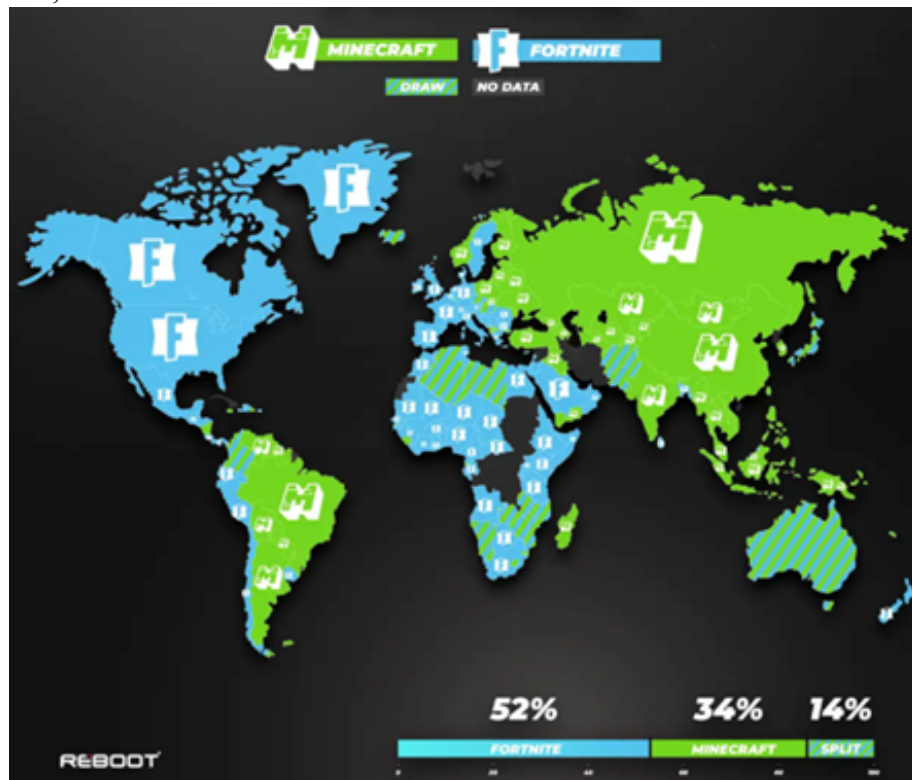
¹⁷⁵. Marine Jeannin, *op. cit.*

¹⁷⁶. “Des jeux 100% africains”, *TV5 Monde* online, March 4, 2022, <https://information.tv5monde.com/video/des-jeux-videos-100-africains-afrikhady>.

training programs dedicated to African talents have been developed but yet remain far from commonplace in international studios¹⁷⁷. Thus, experts say that African video games should soon flood the market: “in the next few years, we will see a growth peak” predicts Nick Hall, co-founder of Africa Games Week, because the continent is home to “the last untapped consumer market and has the potential to exceed one billion players”¹⁷⁸.

◆ *b) Foreign games' success*

While waiting for African video games, which are still negligible and little known to the public, to flood the market, gamers are more easily able to access content from the United States, Europe and Japan. For example, in two surveys conducted between January and March 2020¹⁷⁹, and again in November 2020¹⁸⁰, Fortnite is the most searched game on Google in each African country. Admittedly, the period coincides with the anger of South African players, notably expressed on Twitter by the hashtag #AfricanFortniteServers, calling on the American studio Epic Games to create at least one server on the continent¹⁸¹. However, as can be seen from the following documents, 35 of the 48 Sub-Saharan African countries surveyed place Fortnite ahead of Minecraft: out of a total of almost 870,000 searches made each month for both games, 58% are for Fortnite and 42% for Minecraft¹⁸².



¹⁷⁷. Yassin Ciyow, *op. cit.*

¹⁷⁸. Jack Dutton, “L’Afrique, dernier eldorado pour l’industrie du jeu vidéo”, *VOA Afrique*, February 24, 2022, <https://www.voaafrique.com/a/l-afrique-dernier-eldorado-pour-l-industrie-du-jeu-vidéo/6457610.html>.

¹⁷⁹. “Gamer Index”, Comparethemarket, accessed March 02, 2023, <https://www.comparethemarket.com/broadband/content/global-gamer-index/>.

¹⁸⁰. “Fortnite vs Minecraft – World Popularity Graph”, Reboot, accessed March 02, 2023, <https://www.rebootonline.com/digital-pr/assets/fortnite-vs-minecraft/>.

¹⁸¹. Verny Joy, “South Africa : Gamers Demand Fortnite African Server”, *Digital Times*, August 20, 2020, <https://www.digitaltimes.africa/south-africa-gamers-demand-fortnite-african-server/>.

¹⁸². “Fortnite vs Minecraft – World Popularity Graph”, Reboot, accessed March 02, 2023, <https://www.rebootonline.com/digital-pr/assets/fortnite-vs-minecraft/>.

CONTINENT	DOMINANT GAME	% OF FORTNITE SEARCHES	% OF MINECRAFT SEARCHES	SAME NO. SEARCHES FOR BOTH GAMES
Africa	Fortnite	71%	11%	18%
Asia	Minecraft	31%	65%	4%
Oceania	Minecraft	20%	40%	40%
Europe	Fortnite	67%	18%	15%
North America	Fortnite	73%	13%	13%
South America	Minecraft	33%	58%	8%

World map and chart on the popularity of Fortnite and Minecraft¹⁸³

The growing success of Fortnite is interesting because it reveals its mutation. Released in 2011, this survival game distributed in three different game modes has become an "economic, social, sports and cultural phenomenon"¹⁸⁴. Fortnite is no longer just a video game: through the distribution of series, concerts, promotional events, and political rallies, it has become a global medium with a community of 350 million people. Within the video game industry, Fortnite foreshadows the metaverses of tomorrow.

- *3.1.2 Will the metaverse bet be sustainable?*

- ◆ *a) Definition*

While the concept of the metaverse has recently gained popularity with the transformation of the Facebook group into Meta, as announced by Mark Zuckerberg on October 28, 2021, the virtual worlds of Second Life (2003) as well as online gaming platforms such as Roblox (2004) and Fortnite (2011) had already been foreshadowing these future universes for some years. An extension of today's web where users can live immersive experiences in real time in parallel three-dimensional and interconnected worlds, the metaverse combines different technologies¹⁸⁵ (augmented reality glasses or lenses, virtual reality helmets, sensory sensors, connected suits and gloves, holograms ...) to allow interactions, travel, education and entertainment. Digital doubling of the physical world, the metaverse is the next great technological leap in the evolution of the Internet: it symbolizes its future¹⁸⁶ and is attracting a

¹⁸³. *Ibid.*

¹⁸⁴. Oihab Allal-Chérif, "Fortnite, un phénomène économique, social, sportif et culturel", The Conversation, August 14, 2020, <https://theconversation.com/fortnite-un-phenomene-economique-social-sportif-et-culturel-124543>.

¹⁸⁵. On his Facebook profile, Mark Zuckerberg stated that "progressively, screens, holograms, VR headsets and augmented reality glasses are expected to enable fluid movement from virtual worlds to physical places, like teleportation."

¹⁸⁶. Julien Bergounhoux, "Métavers : de quoi parle-t-on ?", in L'Usine Digitale, November 2, 2021, <https://www.usine-digitale.fr/article/metavers-de-quoi-parle-t-on.N1152967>.

The Facebook/Meta group, the Nvidia company, but also many game developers such as Roblox Corporation or Epic Games talk about the metaverse as the future of the Internet.

great deal of investment¹⁸⁷, as is the case with the African video game market. With immersive gaming environments, live concerts, and digital art galleries¹⁸⁸, activities are beginning to develop there. However, because the metaverse is still in a very early stage of conceptualization and development, it is too early to determine what forms it will take, as the term remains both complex and ambiguous.¹⁸⁹

♦ *b) Sub-Saharan Africa's economic perspectives regarding the metaverse*

Collective, virtual and shared spaces, the virtual universes enabled by the metaverse are also becoming increasingly popular in Sub-Saharan Africa. According to a study conducted by the independent economic consulting firm Analysis Group for Meta, "if adoption of the Metaverse began today and grew at the same rate as mobile technology in Sub-Saharan Africa, it could be associated with a 1.8% contribution to regional GDP over the next 10 years, or \$40 billion by 2031"¹⁹⁰. However, such numbers need to be qualified because, according to these same economists, "the region least affected by the metaverse would be Sub-Saharan Africa" since, compared to other regions of the world (Asia = \$1,000 billion, the United States = \$500 billion, Europe = \$440 billion), the economic impact would be the lowest there¹⁹¹. In 2023, it is still difficult to say whether the metaverse will be a success, since on the one hand, the developments of the various universes announced on a global scale by the [GAFAM](#) and [BATX](#) are still in progress. On the other hand, statistical data on the use of these platforms does not yet exist and figures to evaluate the place of Sub-Saharan Africa in the global virtual reality market are only available at great expense¹⁹².

However, the continent's most affluent and best-connected populations are already using various technologies (smartphones, laptops, VR headsets, digital glasses)¹⁹³ to access existing metaverses. Furthermore, despite the slow and long-term development on the continent, it is possible to gain insight into the current state of the metaverse and glimpse its potential through existing initiatives (see [attachment E](#)).

• *3.1.3 AI: what revolutions are ahead in the field of disinformation?*

Dizzying advances in artificial intelligence (AI) are revolutionizing the world of gaming¹⁹⁴ and enabling the development of virtual worlds in the metaverse¹⁹⁵.

¹⁸⁷. It is now nearly seven to eight years that more than 10,000 employees of the Facebook / Meta group are working on virtual and augmented reality. The group's investment in these areas is colossal: for the year 2021 alone, more than ten billion dollars have been devoted to them.

¹⁸⁸. Joshi, 2022.

¹⁸⁹. Ravenscraft, 2022.

¹⁹⁰. Balkissa Idé Siddo, "Le métaverse ouvrira de nouvelles opportunités pour l'Afrique – Et pour le monde", *AfriqueITNews.com*, September 28, 2022, <https://afriqueitnews.com/editorial/metaverse-ouvrira-nouvelles-opportunités-afrique-monde/>.

¹⁹¹. Sébastien Seibt, "Le métavers, une idée qui vaudrait vraiment 3000 milliards de dollars ?", May 18, 2022, *France 24* online, <https://www.france24.com/fr/éco-tech/20220518-le-métavers-une-idée-qui-vaudrait-vraiment-3-000-milliards-de-dollars>.

¹⁹². \$4,750 to access the report "Virtual Reality Market - Growth, Trends, Impact of Covid-19 and Forecasts 2003-2028" from the consulting firm Mordor Intelligence. Accessed on March 4, 2023, <https://www.mordorintelligence.com/fr/industry-reports/virtual-reality-market>.

¹⁹³. Victor Tubotamuno, "Opportunities and Challenges for Africans in the Metaverse Economy", *Business Insider Africa*, November 13, 2022, <https://africa.businessinsider.com/local/markets/opportunities-and-challenges-for-africans-in-the-metaverse-economy/56q3fdf>.

¹⁹⁴. Bastien L., "IA et gaming : les meilleures intelligences artificielles du jeu vidéo", *LeBigData*, June 30, 2022,

◆ *a) Sacrificing predictability and truth to improve experience*

First and foremost, AI makes the user's actions, reactions, and interactions more fluid, rendering them highly realistic. These improvements also affect non-player characters (NPCs). Currently pre-programmed or scripted in most games, these NPCs will gradually be equipped with true AI to make their behavior completely unpredictable. With the myriad of avatars flourishing in the various universes of the metaverse, managing inappropriate, deviant, or outlaw behavior seems to be a major problem. As in the real world, the quest for realism in virtual universes, enabled by technological advances and AI, is paradoxically accompanied by an increase in unpredictability and uncertainty. In addition, the digital manipulations or hypertruths that AI uses to replace a face or words in a video with other, inauthentic ones should multiply in the metaverse. Following the example of the deepfakes spread on WhatsApp and Facebook in January 2023 by “American pan-Africanists” supporting the Burkinabe junta¹⁹⁶, Rand Waltzman of the RAND Research Institute believes that “virtual environments [...] will allow psychological and emotional manipulation of their users at a level unimaginable in today's media”¹⁹⁷.

◆ *b) Improving the universes*

Indeed, AI factors largely in the improvement of graphics, too, as owing to [Deep Learning](#) or [IA upscaling](#), 3D virtual environments can be transformed into realistic quality photos (see the hijacked images from video games as well as the photos of the Instagrammer Shudu Gram presented in the [introduction](#)). Moreover, the evolution (climatic, temporal, ...) of the virtual environments is made more fluid, faster and more detailed. Like the reconstruction of the city of Los Angeles or Southern California in the game Grand Theft Auto 5, entire areas are now recreated with impressive realism. Furthermore, if AI-based tools exist that can create an infinite number of variations of the same image, the same concept could be applied to video games and metaverse universes to create infinitely evolving and animated worlds. By extension, the imaged environment would become the support for permanent visual and sensory disinformation in these worlds.

◆ *c) Instant universal understanding*

Languages and dialects present a significant challenge for actors seeking to disseminate messages and influence audiences. Beyond developing online tactics and strategies that target specific linguistic and cultural groups using vernacular languages, symbols and images¹⁹⁸, AI offers the potential to make content from social networks, video games, and virtual worlds of the metaverse instantly accessible to all.

<https://www.lebigdata.fr/ia-gaming-jeu-video>.

¹⁹⁵. Ibid.

¹⁹⁶. Lise Kiennemann, “Au Burkina Faso, des deepfakes font croire à un soutien de “panafricanistes” américains à la junte”, France 24 online, January 27, 2023, <https://observers.france24.com/fr/afrique/20230127-intox-deepfake-burkina-faso-panafricanistes-soutien-junte-synthesis>.

¹⁹⁷. “Mettre en lumière les dangers des deepfakes dans le métavers?”, Veille Cyber, October 25, 2022, <https://veille-cyber.com/mettre-en-lumiere-les-danger-des-deepfakes-dans-le-metavers/>.

¹⁹⁸. Langlois, Jean (2019; 2020 & 2021).

For example, the "No Language Left Behind - NLLB-200" project presented by the Meta Group¹⁹⁹ in March 2022 is already capable of directly translating more than 200 languages, including 56 from the African continent, and whose performance exceeds the capabilities of other artificial intelligence translators for African dialects by as much as 70%²⁰⁰. In parallel, Meta is developing a second AI model, the "Universal Speech Translator", to "support all languages, [including] those without a standard writing system and those that are both written and spoken"²⁰¹.

Breaking down language barriers will undoubtedly be a step forward for universal access to online entertainment and digital democracy. However, real-time translation and understanding will also increase the spread of false, dubious or misleading content, making it easier for disinformation actors to do their work.

3.2 Towards a true digital Wild West: how gaming and the metaverse are emerging threats

At first glance, these new virtual spaces are fascinating, but the worlds offered by the metaverse are a concern as well. Indeed, although they still represent only a small segment of Sub-Saharan society, online games, as well as the emerging metaverse, offer a multitude of universes that cast them as new and dangerous battlefields in a cognitive war the stakes of which are far from being fully understood. Their growth forecasts are so optimistic and the technologies they use so advanced that they require specific research from a security perspective²⁰².

• 3.2.1 Risks and threats surrounding virtual communities and their users

Based on observations of other continents, and in the absence of specific rules and regulations, we can identify the following as potential risks and threats beyond those of addiction and mental illness. Video game and metaverse users are more exposed to security vulnerabilities that can put their personal and financial information at risk. In Web 3.0 and in new universes prioritizing exchange over control, content piracy and fraud are on the rise alongside fraud. Phishing by email, social networks or third-party applications, fraud, identity theft, token metadata modification by hackers, crypto-malware and other forms of cybercriminal activity mostly affect virtual communities. For example, cryptocurrency fraud is on the rise in Africa and will account for "13% of investment fraud by 2021"²⁰³. The case of Cryptbot, an information-stealing malware that allows access to victims' cryptocurrency wallets and account credentials, allowed thieves to access half a million dollars in bitcoins.

¹⁹⁹. See [annex F](#)

²⁰⁰. Louise Jean, "Meta a développé une IA capable de traduire 200 langues en temps réel", Clubic, July 6, 2022, <https://www.clubic.com/internet/facebook/actualite-429441-meta-a-une-ia-capable-de-traduire-200-langages-en-temps-reel.html>.

²⁰¹. "Traducteur vocal universel : le projet ambitieux de Meta AI", Tradutec. Accessed on March 05 2023, <https://tradutec.com/blog/le-supertraducteur-vocal-de-meta/>.

²⁰². Suraj Lakhani, Jessica White et al., "Gamification of (violent) extremism. An exploration of emerging trends, future threats scenarios and potential P/CVE solutions", Radicalisation Awareness Network, European Commission, 2022, https://home-affairs.ec.europa.eu/system/files/2022-09/RAN%20Policy%20Support-%20gamification%20of%20violent%20extremism_en.pdf.

²⁰³. Anna Collard, propos tenus lors d'une conférence donnée au Business Intelligence Summit 2022 d'ITWeb (8, 9 et 10 mars 2022). Accessed March 02, 2023, <https://www.itweb.co.za/event/itweb-business-intelligence-summit-2022/>.

Cyberbullying, online harassment, sexism, racism and all forms of extremism (including religious) are tenfold in these virtual universes. Researchers are already claiming that developments in the gaming and metaverse worlds "promise extremists new ways to exert influence through fear, threat and coercion"²⁰⁴. Joel S. Elson, assistant professor of IT Innovation at the University of Nebraska Omaha, further believes that the metaverse is likely to become a new area of terrorist activity, particularly in terms of organization, recruitment, and targeting²⁰⁵.

- *3.2.2 Potential vectors and catalysts of cognitive warfare: video games and the metaverse.*

Beyond the eight weak signals already identified for social networks ([part 2.2.2](#)), which align perfectly with the gaming and metaverse worlds, online games and future metaverses are likely to become new vectors of cognitive warfare in the region in the short term for several reasons.

These new universes are based on real and virtual social interactions mixing real and fictitious identities represented by avatars. Moreover, because of the cohesion and trust that exists within a single virtual community, users are inclined to be more susceptible to being influenced by the opinions of others and thus more vulnerable to cognitive warfare tactics such as [social engineering](#).²⁰⁶

Many African children are growing up with technology and therefore playing games at a relatively early age. As Warner, Chapin and Weiss showed in 2020, terrorist organizations that seek to instill their ideologies and beliefs in children at the earliest possible age take a different approach than they do with adolescents. Al Qaeda in the Islamic Maghreb (AQIM), for example, has shifted its strategy by targeting children under the age of 14.

Unfortunately, it will be technically difficult to monitor the billions of avatars having live discussions across virtual worlds because these exchanges will generate huge amounts of data. Stanford University conducted a study showing that 20 minutes spent in the metaverse "provided more than two million unique body records"²⁰⁷.

- *3.2.3 Hijacking of video games and metaverses: what consequences?*

Beyond the exploitation of these features, the operation of video games and metaverses could be directly used for cognitive warfare in the following areas:

- **Recruitment:** terrorist groups as well as other non-state actors could in the future use online games and the metaverse to recruit new members, expand their networks and increase their

²⁰⁴

²⁰⁵. Joel S. Elson et al., "The Metaverse Offers a Future Full of Potential – For Terrorists and Extremists, Too", The Conversation, January 7, 2022, <https://theconversation.com/the-metaverse-offers-a-future-full-of-potential-for-terrorists-and-extremists-too-173622>

²⁰⁶. Nnamdi O. Madichie, Robert Ebo Hinson, "Challenges and Opportunities of Africa's Creative Industries and International Business Development in Africa", Emerald Publishing Limited, Bingley, pp. 13-26, January 21, 2022, <https://doi.org/10.1108/978-1-80071-302-420211002>

²⁰⁷. Jane Wakefield, "Métavers : est-ce le futur lieu de travail ?", BBC News Afrique, January 15, 2023, <https://www.bbc.com/afrique/monde-64211798>.

operational capabilities. These worlds allow individuals to connect with like-minded individuals, including potential Western recruits. They also allow them to engage in activities that promote the group's ideology. The example of direct recruitment within the game Fortnite in 2019 illustrates the method used: players are approached and then lured to other closed discussion spaces, accessible only by invitation. As on social networks, recruiters spread their ideas in these communities, which they federate in order to be able to mobilize them later.²⁰⁸

- **Propaganda:** in line with the current use of social networks and the hijacking of certain video games (Call of Duty, Arma 3, Metal Gear Solid, etc.), these universes could be used to disseminate propaganda messages to a large audience. These messages can actually be embedded at the source or spread through chat rooms, forums and other online servers like Twitch, Discord, Steam and DLive.

- **Training and education:** online games and the metaverse could finally be used to train members of terrorist groups and other non-state actors. Indeed, these worlds can be used to simulate real-world scenarios and teach individuals how to carry out attacks or other types of activities. Following the admission by Anders Breivik, the Norwegian right-wing terrorist who carried out the Oslo and Utoya attacks in 2011, that he used Call of Duty for training purposes, the metaverse could expand and facilitate this use: training could be done by playing games in 3D virtual spaces built to look like their targets.

- **Coordination, planning and execution of attacks.**

- **Selection of new targets.**

For these last two domains, it would be a matter of identifying vulnerabilities and/or virtual buildings, banking systems, political, religious or cultural communities, then be accepted inside these universes to collect a maximum of data and execute the planned actions so that they have maximum impact, both virtually and in reality.

Hijacking virtual universes could therefore have a significant impact on Sub-Saharan Africa in terms of **radicalization**: These worlds could effectively be used to promote extremist ideologies and foster a sense of community among like-minded individuals. For Linda Schlegel, this “gamified radicalization provides an entry point into extremism and a slippery slope into violence”²⁰⁹. However, even if the environment (theme and content) of video games is hijacked to be used as a propaganda vector, Schlegel points out that “there is no evidence to suggest that gamers are more susceptible to radicalization or propaganda”²¹⁰.

²⁰⁸. “Quelle stratégie européenne pour les jeux vidéo ?”, La Faute à l’Europe, February 22, 2023, https://www.francetvinfo.fr/replay-magazine/franceinfo/la-faute-a-l-europe/la-faute-a-l-europe-du-mercredi-22-fevrier-2023_5673920.html.

²⁰⁹. Linda Schlegel, “Jumanji extremism? The potential role of gamification and games in radicalization processes”, Journal for Deradicalization, No. 23, June 24, 2020, <https://journals.sfu.ca/jd/index.php/jd/article/view/359>.

²¹⁰. Linda Schlegel, “Into the Dungeon? Possibilities for Primary and Secondary Prevention on Gaming Platforms”, Global Network on Extremism & Technology, September 15, 2021, <https://gnet-research.org/2021/09/15/into-the-dungeon-possibilities-for-primary-and-secondary-prevention-on-gaming-adjacent-platforms/>.

3.3 Will Sub-Saharan Africa's potential make it a future refuge?

- 3.3.1 *The power of storytelling*

- ◆ a) *Narratives for the Africa of tomorrow*

The use of metaverses and games for online cognitive operations is a relatively new and evolving phenomenon. Its impact is not yet fully studied or understood. However, it is likely that as these technologies become more widespread and complex, and increasingly difficult to detect, they will become even more fearsome tools for influence and propaganda operations.

Far from being neutral, digital technologies are above all vectors of meaning. Considered as political tools by the digital sociologist Dominique Cardon²¹¹, they reflect above all the interests of their designers. If the former CEO of Google, Eric Schmidt²¹², is convinced that the Internet will split into two camps by 2030, one led by the Chinese and the other by the United States^{213 214}, we believe that this will be accelerated by the advent of the metaverse, and that the emergence of new actors, especially private ones, cannot be ruled out. This multipolarization of the Internet or “splinternet”²¹⁵ is already clearly visible in Sub-Saharan Africa through the presence, influence and competition of States and groups of States (the United States, China, Russia, Turkey, France, the European Union) and non-state actors: in Africa, technology is “the vector of an idea of the world, of an ideology”²¹⁶. For Asma Mhalla²¹⁷, a specialist in the political issues of the digital world, the objective of the narratives disseminated is to accentuate the flaws in a given society in order to polarize it and then destabilize it.

- ◆ b) *Narratives for the Africa of tomorrow*

The creation of a video game or metaverse is a way to imagine the world and transmit different messages. In Sub-Saharan Africa, the creation of video games or metaverses could be an opportunity to present a different narrative of African history and culture. The power of storytelling could challenge and overcome residual external influences and stereotypes from the colonial era.

²¹¹. Dominique Cardon, “Culture numérique”, Presses de Sciences Po, 2019, <https://doi.org/10.4000/communication.11826>.

²¹². Lora Kolodny, “Former Google CEO predicts the internet will split in two — and one part will be led by China”, *CNBC*, September 21, 2018, <https://www.cnbc.com/2018/09/20/eric-schmidt-ex-google-ceo-predicts-internet-split-china.html>.

²¹³. Sarah Vennen, “Cyber-colonialisme : comment le régime de techno-surveillance chinois s’impose au Zimbabwe”, *LVSL*, February 14, 2021, <https://lvsl.fr/cyber-colonialisme-comment-le-regime-de-techno-surveillance-chinois-simpose-au-zimbabwe/>.

²¹⁴. Lora Kolodny, “Former Google CEO predicts the internet will split in two — and one part will be led by China”, *CNBC*, September 21, 2018, <https://www.cnbc.com/2018/09/20/eric-schmidt-ex-google-ceo-predicts-internet-split-china.html>.

²¹⁵. Pour Asma Mhalla, le « splinternet » est la « fragmentation de l’Internet global en autant de blocs idéologiques ».

²¹⁶. Asma Mhalla, “Le numérique est fondamentalement politique”, *Le Monde Numérique*, November 21, 2022, <https://www.mondenumerique.info/le-numerique-est-fondamentalement-politique-asma-mhalla-conseillere-strategique-en-politique-technologique/>.

²¹⁷. *Ibid.*

For UNESCO, technology is fundamental in promoting this narrative and protecting African cultural diversity. With current and future digital devices, it sees the metaverse as an opportunity to break free from European museums and collections of African art, to reclaim the works, history, and different cultures of the continent and make them permanently accessible to all²¹⁸. The example of the commitment of the African Union to the development of the metaverse is a good example of this. The example of the Meta group's commitment to Africa is in line with this and is part of the deployment of the group's \$50 million research fund on extended reality (XR). Thus, its program, "Future Africa: Telling Stories, Building Worlds" (see [attachment F](#)), conducted in partnership with three players on the continent, Africa No Filter (ANF)²¹⁹, Electric South²²⁰ and Imisi3D²²¹, is based on the use of new technologies, the awarding of grants and the establishment of mentorships in order to open up spaces for original voices and underrepresented stories²²².

The virtual worlds offered by games, the Internet and the metaverse also represent an opportunity to revive old stories and local legends. For example, the Ghanaian studio Leti Arts offers a world comparable to the Marvel universe in which African characters evolve. From the Niger assassin to the Kenyan sorcerer, from the spider god Ananse to the powerful Zulu king Shaka, African virtual worlds are constantly developing to embody narratives that are exclusively perpetuated by oral traditions.



Excerpts from Africa's Legend, the emblematic game of the Leti Arts studio, a superhero universe steeped in African mythology and culture²²³

Other initiatives, such as those of Teddy Kossoko, founder of the Masseka Game Studio based in France, who named his first mobile game "Kissoro" in reference to the awale, one of the oldest board games in the world, are worth highlighting because they place Africa firmly

²¹⁸. "How can the metaverse bolster African culture in the global scene?", METASEUM.space, June 8, 2022, <https://metaseumspace.medium.com/how-can-the-metaverse-bolster-african-culture-in-the-global-scene-e2dd5c701de3>.

²¹⁹. ANF describes itself as "a donor collaboration that supports the development of nuanced and contemporary stories to change stereotypical and harmful narratives in and about Africa". Accessed on March 03, 2023, <http://africanofilter.org/who-we-are>.

²²⁰. A nonprofit company, Electric South collaborates with artists across Africa in the field of emerging storytelling, through labs, production and distribution. Accessed on March 03, 2023, <https://www.electricsouth.org/>.

²²¹. Imisi3D is a Nigerian extended reality (XR) creation lab focused on building the African XR ecosystem, developing a community of African augmented/real reality creators, creating solutions, providing educational and engagement experiences using these technologies. Accessed on March 03, 2023, <https://imisi3d.com/>.

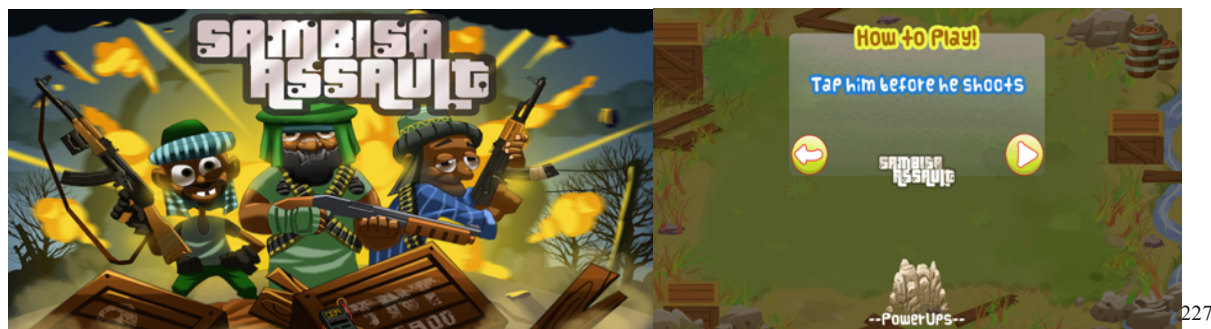
²²². Balkissa Ide Siddo, *op. cit.*

²²³. "Africa's Legend", Leti Arts. Accessed on March 04, 2023, <http://www.letiarts.com>.

at the heart of the design. While his ambition is to “create more and more African models for people to identify with”²²⁴, Kossoko factors the political into his projects by asserting that “as an African, we start with a historical handicap. We have a whole set of things to deconstruct. We have to teach young people to love themselves, to value themselves”²²⁵.

◆ *b) Youth, at the heart of narrative creation*

Youth, “in search of black superheroes in the image of the continent”²²⁶, is indeed the demographic making possible this transition to digital via the appropriation of new technologies and science fiction. Although it is difficult to move away from the formats, content and references of foreign video games, the young seek emancipation from them while striving to find new sources of inspiration. Transforming virtual universes into pedagogical devices, advertising and spaces of struggle, the creators value the symbols, causes and civilizations of the continent by proposing imaginary worlds built around stories anchored in reality and focused on social or economic issues. Sambisa Assault, a free speed game that involves tracking down, hitting and eliminating members of the Boko Haram group in the jungle, was for example developed in 2014 by Nigerian mobile game start-up Chopup to contribute to the fight against terrorism.



One of the underlying objectives behind this desire to create content and narratives related to a common environment is to develop new communities of interest, primarily for Africans both on their continent and among the diaspora. Moreover, the number of games inspired by the daily lives of Africans, such as “Okada Ride”, “Kidnapped”, and “Ole” illustrates a “gamification of reality”, with “its perils and pitfalls translated into pixels, bits and bytes”²²⁸.

• *3.3.2 From gaming to gamification: entertaining is the best way to propagate*

Gamification is the integration of certain game mechanisms into processes that are not primarily intended to be playful. The goals of such an approach are multiple: to make a process more attractive, to make a model more efficient, and to find innovative solutions.

²²⁴. Lionel Bonaventure, “Des jeux vidéo inédits avec l’Afrique au cœur”, *L’Express* online, March 11, 2022, https://www.lexpress.fr/monde/des-jeux-video-inedits-avec-l-afrique-au-coeur_2169628.html.

²²⁵. Ibid.

²²⁶. Aurore Bonny, “Le jeu vidéo est porté par une jeunesse qui se projette dans un futur meilleur”, *cio-mag.com*, April 16, 2022, <https://cio-mag.com/le-jeu-video-est-porte-par-une-jeunesse-qui-se-projette-dans-un-futur-meilleur/>.

²²⁷. Accessed on March 04, <https://www.chopup.me/app/sambisa-assault/>.

²²⁸. Christopher Vourlias, “Video game culture takes hold across Nigeria”, *Aljazeera America*, December 28, 2014, <http://america.aljazeera.com/articles/2014/12/28/nigeria-gaming.html>.

Today, through “serious games”, the video game transcends its primary function: it is used to raise awareness, and to accompany training through fun and educational courses in order to simulate concrete situations. It thus allows users to feel involved and to meet the objectives set by the game designer. As a new lever of engagement, especially with younger generations, gamification is inseparable from the virtual worlds of video games and the metaverse.

The games related to jihadism studied in [attachment G](#) show that gamification is increasingly used by violent actors to facilitate radicalization processes: “the target group is young men, who most likely enjoy video games anyway, and then come to play ideologically charged versions of what they already know”²²⁹. By extension, as Schlegel²³⁰ and Lakhani²³¹ argue, metaverse worlds should “probably attract the same gamers who currently frequent gaming platforms and websites”²³² by offering a gamification of extremism and disinformation.

- *3.3.3 To each universe its narrative: the African metaverse as future refuge of ideologies*

Beyond the players and users already frequenting sites or games linked to ideologies, we believe that in the unregulated and unmonitored virtual universes to come, all visitors will be permanently confronted with textual messages (for example, advertising messages) as well as visual environments replete with ideologies, disinformation and propaganda. Competition and confrontation between different ways of thinking and seeing the world will be permanent, and the virtual possibilities will also reinforce those acts that can be carried out in these spaces. These acts can be of various kinds on a scale ranging from incivilities to isolated aggressions or those committed against specific groups.

Moreover, in closed universes, i.e. accessible only to members of the same community, the risk that sectarian logic will develop and that lawless zones will multiply is particularly high. As the boundary between communities of interest and communities of ideas sometimes becomes blurred, it is also highly likely that these universes will become the new sanctuaries of ideologies. The fights against terrorism, radicalization and extremism in the real world may no longer have a hold in these spaces where actors, sheltered from firewalls, will be able to continue their activities and develop them free of sanction. In the face of the multitude of servers and the use of online tricks (such as the fictitious naming of servers with no connection to the real activities that are carried out on them), the metaphor of the hydra applied to terrorism and clandestine activities has never been more relevant.

- *3.3.4 Will the war of the avatars take place?*

New refuges of disinformation and propaganda, virtual universes will become battlefields of an online cognitive war where fighters with multiple identities evolve. If video games and the metaverse allow their users to be whoever they want to be and to easily change their identity,

²²⁹. Linda Schlegel, *op. cit.*

²³⁰. Ibid.

²³¹. Suraj Lakhani, “Video Gaming and (Violent) Extremism: An Exploration of the Current Landscape, Trends, and Threats”, Radicalisation Awareness Network (RAN), European Commission, 2021, <https://home-affairs.ec.europa.eu>.

²³². Suraj Lakhani, Jessica White et al., *op. cit.*

this poses problems of identification of real people, of incarnation²³³ and the attribution of acts. Without mentioning the quality of the avatars, the multiplication of identities permitted in these universes, as well as the presence of trolls capable of evolving under the cover of new avatars, foreshadow a complexification of the world where it will be increasingly difficult to discern the real from the fake by the senses alone. With the progress of AI, the improvement of deepfakes and instant comprehension, digital entities will look more and more like real people. Moreover, in order to virtually embody the person or character that we can never be or become real people will exploit the infinite possibilities offered by avatars. For example, in the Africarare Ubuntuland metaverse, three-dimensional avatars featuring African folklore are already available for purchase as non-fungible tokens (NFT).



Examples of avatars from Ubuntoland²³⁴

The ease of metamorphosis offered by these limitless universes would also make it possible, if one had the means, to satisfy the desires of the "virtual self" in more ways than one. First, it would make it possible to express one's nature and ideas within "safe sphere"²³⁵ type communities of shared interests without being subject to criticism or harassment. On the other

²³³. Etienne Grass, "Le métavers est son double", March 29, 2022, <https://www.lesechos.fr/idees-debats/editos-analyses/le-metavers-et-son-double-1396839>.

²³⁴. "Welcome yo Ubuntoland step into virtual Africa". Accessed March 03, 2023, <https://www.africarare.io/>.

²³⁵. In the scenario "Chronicle of a cultural death foretold" by the French Red Team, the "safe sphere" is defined as "virtual computer bubbles in the form of "community networks" that aim to add elements of augmented reality to the perceptual field in order to build alternative realities. "Chronicle of a cultural death foretold", *The Red Team*. Accessed on March 06, 2023, <https://redteamdefense.org/en/season-1/chronicle-of-a-cultural-death-foretold>

hand, avatars also make it possible to better hide one's identity when it is difficult to assume it online in social networks and current games, or in the metaverse universes of tomorrow.

Conclusion

Online entertainment, through social networks, video games and the emergence of the metaverse, offers new opportunities for cognitive warfare in Sub-Saharan Africa that could have far-reaching consequences for the continent as well as for the rest of the world. While the studied region still has many issues and lags in digital development and access to online entertainment, the forecasted trends point to the advent of a true digital Far West. If the Internet evolutions wrought by new technologies will rapidly transform African societies unequally prepared to face digital challenges, they will also be exploited by a multitude of actors (individuals, communities, states, non-state groups) with varying motivations. From disinformation to destabilization through radicalization, the cognitive warfare techniques used in virtual worlds dedicated to entertainment could be used to achieve objectives such as recruitment, propaganda, training, targeting, as well as planning and conducting clandestine actions.

Therefore, it is important that the populations and states of Sub-Saharan Africa guard against these potential threats that are emerging as quickly as the current wave of disinformation spreading on social networks. The development of cognitive online warfare effectively reveals severe digital repression within the region, deficiencies in terms of anticipation, investment and financing, as well as delays in education and training. Thinking as early as possible about the forms that prevention and intervention in these digital spaces²³⁶ could take would at least make it possible to limit the effects of this cognitive war on individuals and societies. However, this raises the dual question of the use of entertainment to combat misinformation: is prevention achieved through games and/or are games a tool for prevention? In this conclusion, we suggest several avenues to counter or at least slow the rise of cognitive warfare via video games and social networks.

#1 - Convincing the authorities to deal with the threat without repression

Despite the diversity of threats and the difficulties in attributing actions in virtual worlds, we believe that the first step is to differentiate risk assessment and management from restrictions on access to online entertainment, or even indiscriminate repression.

While it is fundamental to move away from our Western conceptions of the issue in Sub-Saharan Africa, we also believe that before any education, content moderation, or preventive actions can be taken, it is essential to get various communities, organizations and authorities in the region to work together to gain efficacy and visibility on the scope of the threat. The initiatives that are flourishing, such as the Metaverse Summit, deserve to be perpetuated and amplified on a continental scale. Whether in public or private spaces, a mobilization of intelligence agencies, surveillance services, law enforcement agencies and military forces would also allow a more accurate assessment of the situation in order to avoid the wave of digital repression currently observed on the continent.

²³⁶. Justin Hendrix, "Confronting Hate and Extremism in Online Games", Tech Policy Press, December 18, 2022, 00 :23 :20, <https://techpolicy.press/confronting-hate-and-extremism-in-online-games/>.

#2 - Develop research on online entertainment in Sub-Saharan Africa.

More research on the virtual worlds of video games and metaverses is needed. As Firas Mahmoud mentions in his report on the gamification of Jihad, "researchers are still at the most basic level"²³⁷ on the topic of gamified virtual worlds. In addition, for example, it may be useful to integrate new virtual worlds into studies of violent extremist organizations (VEOs) as well as prevention and countering violent extremism (P/CVE) efforts to better understand the threat spectrum in Sub-Saharan Africa. For example, as with Anne Mette Thorhauge's decade-long research on gaming and addiction in Denmark²³⁸, the study of potential threats posed by virtual worlds in Sub-Saharan Africa could be done on a country-by-country basis by examining economies, genders, communities and types of gamers, possibly using the lens of social psychology and neurophysiology. This would provide a concrete, country-specific inventory so that countries can raise awareness and develop strategies to contain, counter and eliminate any potential threats.

#3 - Act and react with countermeasures

Like the measures taken to counter the online propaganda of terrorist groups, governments and security agencies in Sub-Saharan Africa could adopt countermeasures including:

- **“Informed” monitoring of online activity and disruption:** without violating freedom of expression or falling into authoritarian logic, governments and security agencies could monitor online activity using undercover avatars to identify potential threats and take action before attacks can be carried out.
- **Dissemination of narratives:** counter-narratives could effectively be developed and disseminated to challenge extremist propaganda messages or outside influence. These could be narratives that value the culture and history of the continent and/or messages that promote the values of peace, tolerance, and respect for diversity.
- **Awareness-raising:** this should be developed, especially among the least educated populations, to prevent radicalization by promoting critical thinking, media literacy and tolerance.

#4 - Collecting GAM-INT

Western countries are questioning the utility of creating a full-fledged, unique and specialized GAM-INT discipline on game-based intelligence. However, given the gaps mentioned in terms of research and strategic anticipation on the potential of virtual universes in Sub-Saharan Africa, we consider that whatever its form, intelligence gathering through games and in the metaverse is urgent and crucial. In this sense, GAM-INT is an opportunity to be seized by African countries: it would allow them to precisely follow the evolution of video games and the metaverse in order to get a foothold as soon as possible before they become too

²³⁷. Firas Mahmoud, “Playing with religion: the gamification of Jihad, *Danish Institute for International Studies*”, DIIS Report 2022: 06, September 27, 2022, <https://www.diis.dk/en/research/new-report-explores-the-field-between-gaming-jihadism>.

²³⁸. Anne Mette Thorhauge, “Games in the platform economy: From Market Power to Marketplace Power and Beyond”, University Press, 2023.

complex or out of reach. Without closing the debate on the question of its interdisciplinarity, this GAM-INT could be based on:

- [HUMINT](#) allowing to get as close as possible to the communities of players or users of the metaverse to obtain proximity intelligence;
- CYBER and [SIGINT](#) for the analysis of data collected during the creation of game profiles or membership in virtual communities;
- “Computer Network Exploitation” (CNE) to decrypt and analyze the content of telephones, game consoles and connected objects, as well as digital footprints and the state of virtual networks.

In any case, to be even more efficient, GAM-INT should be accompanied by increasing collaboration between gamers' communities, virtual universe designers, researchers and authorities, especially for the implementation of regulations regarding content moderation and control.

#5 - Relying on AI to fight against misinformation

AI could be used to fight misinformation in Sub-Saharan Africa by helping to identify and verify information. Indeed, algorithms could detect fake news by analyzing the content of articles and identifying inconsistencies or unreliable sources. Similarly, AI could help identify sources by tracking the spread of fake news on social networks and associating them with specific accounts or groups.

Furthermore, the development of AI algorithms and tools designed to fight misinformation and prevent the manipulation of public opinion seems necessary. This could be accomplished through partnerships between governments, technology companies and civil society organizations. The objective, while admittedly ambitious, would be for them to work together to develop effective, ethical solutions guided by principles of transparency, accountability and respect for human rights.

#6 - Pre-bunk against disinformation

Fact-checking and explanation initiatives are growing on the continent, notably through fact-checking agencies. This is indicative of the many efforts being made to continually debunk misinformation. However, recent studies by British researchers have demonstrated the effectiveness of upstream actions, particularly through games, and advocate "inoculation against misinformation"²³⁹. Pre-bunking, the name given to this process of demystifying lies, tactics or sources before they are disseminated, consists of exposing individuals to the mechanisms of misinformation to help them develop resistance to any future exposure. The aim is clearly to teach them to spot false information, and this is also possible at little cost: thanks to free online games, such as "Choose Your Own Fake News"²⁴⁰, a Ugandan decision

²³⁹. Susan Nolan, Michael Kimball, “What Is Prebunking?”, Psychology Today, August 27, 2021, <https://www.psychologytoday.com/us/blog/misinformation-desk/202108/what-is-prebunking>.

²⁴⁰. Accessed on March 7, 2023, <https://chooseyourownfakenews.com/>.

support game, it is possible to fight against misinformation²⁴¹. We therefore suggest developing these "pre-bunking games" at the country level. Backed by existing African fact-checking agencies on the continent, we can imagine how complementary and emancipatory these projects could be for populations that have been influenced and manipulated for too long.



Presentation of the game "Choose Your Own Fake News"²⁴²

Ultimately, if online entertainment in Sub-Saharan Africa is a major theater of cognitive warfare, it is also vital in ensuring the continent's future and its digital development. Through the excitement, hope and ambition they provide for younger generations, social networks, video games and metaverses should enable Sub-Saharan Africa to emancipate itself and compete by 2050 with current leaders, including Europe and the United States²⁴³. As Teddy Kossoko, winner of the 2022 Forbes Africa ranking and creator of the Masseka²⁴⁴ Game studio and the Gara app store states "Africa is not a black box. We have a lot to share with the world". The success of his digital creations and the advent of virtual worlds should allow him to be at the head of the first African unicorn of the video game industry. These are undeniably spaces that must be explored and understood today, not in a spirit of conquest but to better apprehend the major threats they could represent in the future. This research has allowed the authors to outline the future issues in the metaverse and video gaming will represent SSA, although this work merits further study. As a key to understanding SSA and the evolving messaging space online, this paper is intended equally for France and the U.S. while it remains for each country, of course, to summon the will to invest in these virtual domains in order to keep the world free and defend democracy. The main recommendations of the

²⁴¹. Amanda Lichtenstein, "A new game plays with ideas about how disinformation works in East Africa", Global Voices, June 16, 2020, <https://globalvoices.org/2020/06/16/a-new-game-plays-with-ideas-about-how-disinformation-works-in-east-africa/>.

²⁴². In 2016, Neema Iyer, a Ugandan artist, designer and technologist founds the civic technology company, Pollicy, based in Kampala, Uganda. Through a partnership with the Mozilla Foundation, Pollicy's aim is to tackle the spread of misinformation in East Africa. Neema Iyer created in 2020 the web-based game "Choose Your Own Fake News" where characters explore different scenarios that portray how misinformation can have real-life consequences.

²⁴³. L'Afrique et le jeu vidéo. Partie 1 : un désir d'innovation au message hétéroclite, Jeu.Video. Accessed on March 09, 2023, <https://jeu.video/article/dahalo-lafrique-jeu-video-partie-1-desir-dinnovation-message-heteroclite>.

²⁴⁴. In Sango, national language in CAR, "Masseka" "youth".

authors are the development of interaction, training and partnerships regarding disinformation, especially as it pertains to AI, in order to limit biases and prejudices, intentional or otherwise. This should be done concurrently with the implementation of strategies such as pre-bunking and others mentioned here, all adapted to the particular needs, habits and customs of the countries of Sub-Saharan Africa.

Glossary

Astroturfing: An unfair practice of propaganda and manipulation orchestrated and planned for political, ideological, economic or commercial purposes. Used on the Internet by groups or organizations, it can be generated by real people, robots or algorithms. This practice uses the media to create the impression that a mass phenomenon is spontaneous. In reality, this is not the case: this virtual movement is created from scratch in order to influence public opinion.

BATX: Stands for Baidu, Alibaba, Tencent, Xiaomi, the four Chinese companies that dominate the Chinese Internet.

Cherry picking: A process of presenting facts that gives credence to one's opinion while ignoring cases that contradict it.

Cheap fake: Cheap disinformation.

Click-to-tweet: These are extensions that allow you to make a word or a sentence of your article clickable to share it on Twitter. Instead of sharing the link of the article, the sharing is limited to the clickable sentence which of course refers to the article.

Cognitive sciences: They aim to decipher human thought by focusing on the major mental functions of perception, memory, reasoning, language, emotions, motor skills and decision making. They involve a wide range of disciplines: neuroscience, experimental psychology, computer science, mathematical modelling, linguistics, philosophy, social sciences and economics.

Cognitive warfare: the use of Internet-based platforms and technologies to influence and manipulate perceptions, beliefs, and behaviors of individuals or groups for strategic purposes.

Destabilization: According to the French dictionary *Le Robert*, this word is defined as:

- modification of a political or economic equilibrium, which compromises the acquired equilibrium.
- action to destabilize, to become unstable (on the psychological level).

Disinformation: It is the intentional dissemination of false information in order to advance a political objective.

GAFAM: Stands for Google, Apple, Facebook, Amazon, Microsoft, “the Five” biggest American platforms that dominate the digital market.

Gamification: It is the integration of certain game mechanisms into processes that are not primarily intended to be playful. Gamification has thus several goals: for instance, to make a process more attractive, a model more efficient, to find innovative solutions and much more...`

HUMINT (Human Intelligence): Is intelligence discerned from information collected from human sources.

IA upscaling: Technique that, thanks to AI, increases the number of pixels and thus improves the definition of images.

Misinformation: Dissemination of false information without intent to harm.

Malinformation: Authentic information disseminated for the purpose of causing harm, often by making public information that should remain private.

Metaverse: Touted as the next step in social connectivity, it is an emerging virtual reality space where users around the world can interact with each other and with fictional entities in environments generated entirely by computers.

Propaganda: Psychological action that uses all means of information to propagate a doctrine, create a movement of opinion and bring about a decision.

SIGINT (Signals Intelligence): It is based on the collection of signals and electronic systems used by foreign targets such as communication systems, radars or weapon systems.

Social engineering: The manipulative practice of entering into a relationship with an individual with the aim of obtaining confidential information for fraudulent purposes.

Trolls: People or accounts that infiltrate social networks with messages deliberately designed to stir controversy, create tension, and blur the lines between information, disinformation, and propaganda.

Wagner: A Russian paramilitary group created during the 2014 crisis between the West and Moscow. While private military companies are officially banned in Russia, this group is actually an important and unavoidable geopolitical tool for the country.

Attachments

A – Sub-Saharan Africa



Map of Sub-Saharan Africa²⁴⁵

Sub-Saharan Africa consists of 48 countries, distributed as follows²⁴⁶ :

Central Africa

Angola, Burundi, Central African Republic, Chad, Congo, Democratic Republic of Congo, Republic of Rwanda.

Eastern Africa

Comoros, Eritrea, Ethiopia, Kenya, Madagascar, Mauritius, Seychelles, Somalia, South Sudan, Sudan, Tanzania, Uganda.

NB: Djibouti is not included in Sub-Saharan Africa, as it is handled administratively as part of the Middle East and North Africa.

Southern Africa

Botswana, Eswatini (Formerly Known as Swaziland), Lesotho, Malawi, Mozambique, Namibia, South Africa, Zambia, Zimbabwe.

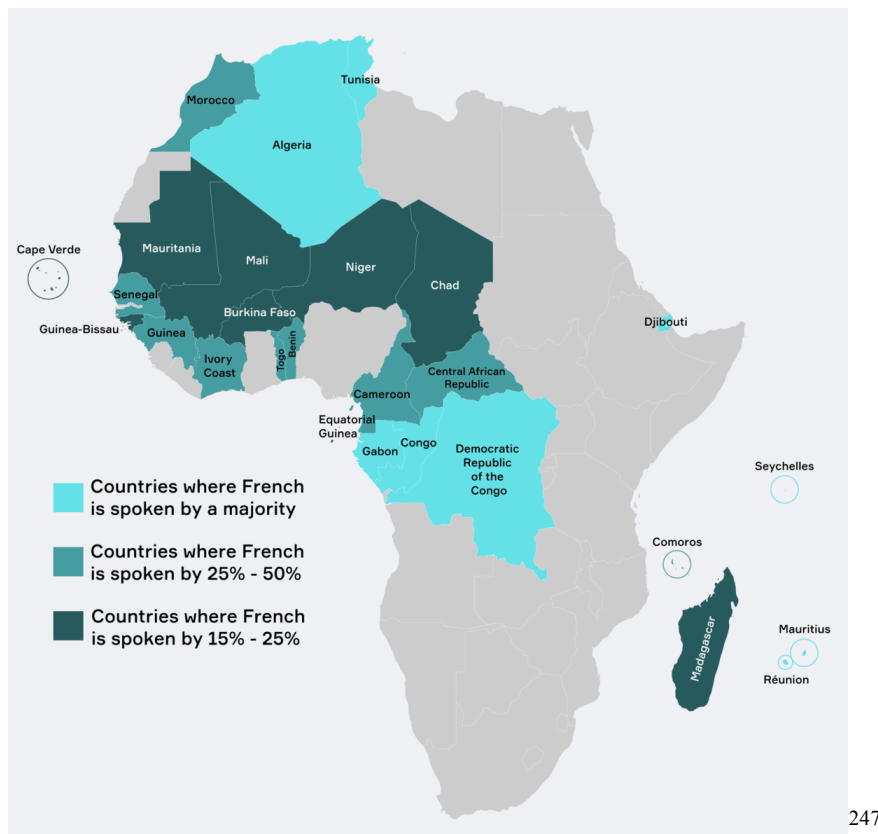
Western Africa

Benin, Burkina Faso, Cabo Verde, Cameroon, Ivory Coast, Equatorial Guinea, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, Sao Tome and Principe, Senegal, Sierra Leone, Togo.

²⁴⁵. Myles D Connor et al. “Burden of Stroke in Black Populations in Sub-Saharan Africa”, *The Lancet Neurology*, vol. 6, no. 3, 2007, pp. 269-278, <https://www.thelancet.com>.

²⁴⁶. “Focus: Sub-Saharan Africa”, Worldbank, accessed February 25, 2023, <https://worldbank.org>.

B - French-speaking African states within Sub-Saharan Africa.



French-speaking Africa refers to all African states that share the French language²⁴⁸. About 189 million Africans speak conversational or fluent French which is either the official language or the co-official language. It includes 21 States and two islands, Reunion and Mayotte.

- Officially French-speaking countries where French is the official language: Benin, Burkina Faso, Congo - Brazzaville, Ivory Coast, Gabon, Guinea Conakry, Mali, Niger, Democratic Republic of Congo (DRC), Senegal, Togo.
- Multilingual countries where French is an official language: Burundi, Cameroon, Central African Republic, Chad, Equatorial Guinea, Comoros, Djibouti, Madagascar, Rwanda, Seychelles.
- Some non-French speaking countries have joined the International Organization of the Francophonie (OIF): Mozambique, Ghana, Guinea-Bissau, Cape Verde, Egypt, Gambia, Sao Tome and Principe.
- Other African states do not have French as an official language but use it widely: Algeria, Morocco, Mauritius, Mauritania, Tunisia.

²⁴⁷. Joe Fitzpatrick, "The most-spoken international languages and lingua francas of Africa", *Lingvist*, June 16, 2022, <https://lingvist.com/blog/the-most-spoken-international-languages-and-linguas-francas-of-africa/>.

²⁴⁸. "La langue française en Afrique", Organisation internationale de la francophonie. Accessed on March 03, 2023, <https://observatoire.francophonie.org/qui-parle-francais-dans-le-monde/la-langue-francaise-en-afrique/>.

C – Typology of online entertainment consumers

The consumers of online entertainment can be divided into different categories, making it possible to affirm that digital Africa is booming. Beyond the aforementioned rates of equipment and access, it is the changing behavior of Sub-Saharan populations that will be studied here.

◆ a) *The most connected*

Despite its low penetration rate in several countries, the Internet is breaking down barriers and reaching the most active and affluent segments of the population everywhere. Among them, young Africans stand out because they are constantly connected. The changes are so rapid that communication is now the third largest expense for young people, just after food and clothing, yet far ahead of transport and cosmetics. The acceleration observed over the past three years is fueling the hopes of digital entrepreneurs. With demographic growth predicted to double the Sub-Saharan population²⁴⁹ by 2050, “Africa is home to the largest youth population in the world, and this next generation will grow up in a digital environment, with video games as their main entertainment preference.”²⁵⁰

◆ b) *The economic actors*

For businesses, online entertainment for this connected population opens new markets to conquer every day through different modes of communication. In their conjoint report "e-Conomy Africa 2020", the International Finance Corporation (IFC) and Google estimate that by 2025, the Internet, combined with economic development, has the potential to contribute \$180 billion to Africa's gross domestic product. To achieve such figures, marketing strategies are designed to be as ambitious as they are effective online. Social networks such as Facebook, now Meta, increasingly video games and the metaverse, are central to this effort.

The "Visa To Africa" campaign to promote African tourism on Instagram is interesting to consider here. Launched in November 2021 by ten young video artists from Senegal, Cameroon, the Democratic Republic of Congo, Ivory Coast and from the diaspora, this campaign aims to "draw the public into a virtual journey through unexplored landscapes and little-known cultures of French-speaking Africa"²⁵¹. Spearheaded by the Meta Group, supported by the World Tourism Organization (UNWTO), as well as the Ministry of Tourism and Recreation of Ivory Coast, this initiative seeks, through information technology, social networks, the power of digital and visual storytelling, to encourage economic recovery and showcase the continent's diversity to a global audience.

◆ c) *Women*

According to The Mobile Gender Gap Report 2022²⁵², 75% of women in Sub-Saharan Africa own a cell phone, but only 37% of them use the mobile Internet.

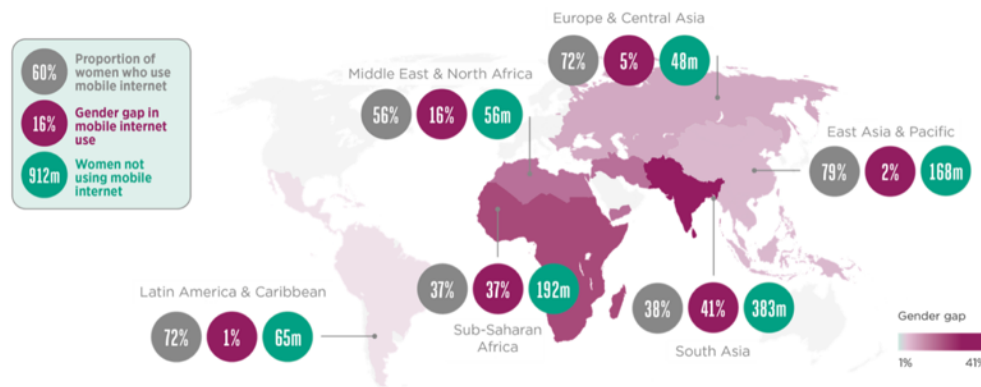
²⁴⁹ According to the French Development Agency (AFD), the population is expected to reach 2.4 billion by 2050.

²⁵⁰ Jens Hilgers, General Partner and founder of BITKRAFT Ventures, a platform for gaming, e-sports and interactive media.

²⁵¹ Aude Darc, “Instagram, une porte d’entrée pour le tourisme africain”, NewAfrican, December 22, 2021.

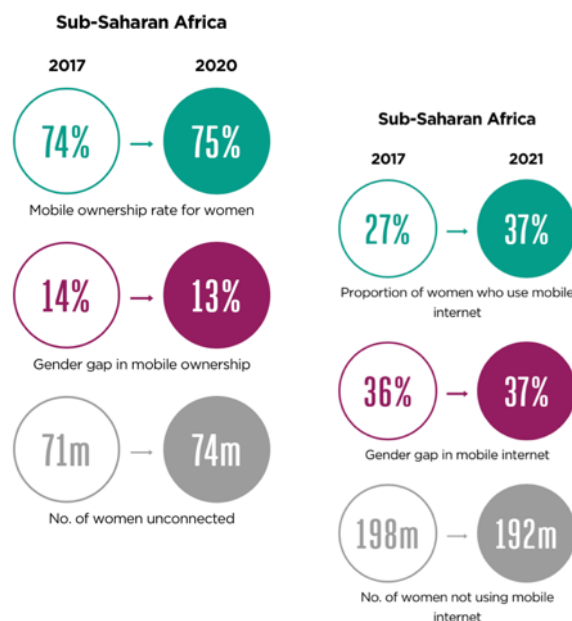
²⁵² GSMA, The Mobile Gender Gap Report, June 2022, <https://www.gsma.com>.

Total adult population



Gender gap in mobile Internet by region and key figures for Sub-Saharan Africa²⁵³

However, women's connectivity is growing slowly and the gender gap remains wide: it stands at 13% for smartphone ownership and 37% for mobile Internet use.



Mobile ownership and mobile Internet usage²⁵⁴

If women now have increased access, it is not because they were given it; rather, they took it thanks to social networks²⁵⁵. Publicly, as in the media, the presence of women is still extremely low in Sub-Saharan Africa: in Senegal, their representation is 6% on television and 2% on radio, yet 25% on social networks. It is true that social networks allow freedom of expression, but not all African women have access to them. Thanks to the Internet and the opportunities it offers, some women have created their own websites to express themselves

²⁵³. GSMA, *Ibid.*

²⁵⁴. GSMA, *Ibid.*

²⁵⁵. Séverine Kodjo-Grandvaux, "On n'a pas donné la parole aux Africaines, elles l'ont prise grâce aux réseaux sociaux", *Le Monde*, 4 juillet 2021.

and even become influencers. A new generation of women is using social networks as a springboard to take on the African media²⁵⁶. As for video games, when they are accessible, one of the barriers to their use by women is social. Although there is little or no data on African women's relationship with video games²⁵⁷, women perceive video games as a male hobby and many are reluctant to identify themselves as gamers. This difficulty increases with age.

◆ *d) Influencers*

The phenomenon of influencers is becoming more and more widespread in Sub-Saharan Africa. Often coming from music or TV, influencers impose themselves on TikTok, Instagram, Twitter and YouTube. Through the audiences they reach, they influence opinions and consumer trends in various fields such as fashion, humor, gastronomy or entrepreneurship, but also politics and the world of information. The line between influencers and activists is often tenuous, as the latter have learned the power of social networks, using them as sounding boards and communication tools opening the doors to the wider world.

For example, the August 2022 election campaign in Kenya revealed a thriving industry of Kenyan influencers who were paid and recruited for their social media presence. On the payroll of candidates, these influencers used their digital footprints to spread key messages in support of particular candidates. While local influencers are now central, the British media²⁵⁸ had already warned about the misuse of social networks during the 2013 and 2017 elections. In particular, they had exposed the significant role played by the company Cambridge Analytica in targeted communication.

These influencers have become real alternatives to traditional media, reaching an increasingly large audience. Indeed, they have become much easier to access than many television or radio channels, or the written press. Paradoxically, they are able to reach the least connected and least educated populations by tapping into their anger and fighting instincts, already sharpened by hard living conditions. In the Sahel region, marked by poverty and insecurity, this energy is often unleashed against any target. Recent riots against French symbols in Mali and Burkina Faso illustrate these mechanisms, which are well understood by Islamist movements and countries such as Russia, China and Turkey.

◆ *e) Online entertainment breaks down barriers: the African diaspora*

Like the Internet itself, this digital influence is far-ranging and does not stop at the borders of the African continent. Messages and ideas are conveyed via social networks and language communities, notably thanks to the diaspora of Sub-Saharan Africa on other continents. According to the Migration Policy Institute²⁵⁹, 35% of this diaspora is in Europe and North

²⁵⁶. AFP, “Une génération de femmes à l’assaut des médias en Afrique”, France24 Île Maurice, May 10, 2018, <https://www.france24.com/fr/20180510-une-generation-femmes-a-lassaut-medias-afrique>.

²⁵⁷. Ngnaoussi, “Les femmes africaines jouent-elles autant aux jeux vidéo que les hommes ?”, January 18, 2020, Christian Elongué, January 18 2020. <https://christianelongue.com/femmes-africaines-jouent-autant-aux-jeux-video-hommes/>.

²⁵⁸. Tony Karumba, “Social media Influencers cash in as presidential election approaches in Kenya”, Africa News, May 2022

²⁵⁹. Migration Policy Institute tabulation of data from the United Nations, Department of Economic and Social Affairs, Population Division, *International Migrant Stock 2020: Destination and Origin*, Table 1: International

America and its power is often underestimated. For example, they have been instrumental in improving the institutional framework of many African countries²⁶⁰, and some countries have even offer them seats in their parliament. In the world of video games, it's of interest here to note the case of Masseka Game Studio, a company founded by a Central African entrepreneur who, relying on the diaspora, creates video games set exclusively within African universes in order to tell less well-known stories of Africa.

Migrant Stock at Mid-Year by Sex and by Region, Country or Area of Destination and Origin.
Link: www.un.org

²⁶⁰. Dramane Coulibaly and Luc Désiré Omgba, 2021. "Why are some African countries succeeding in their democratic transitions while others are failing?", Oxford Economic Papers, Oxford University Press, vol. 73, pages 151-177.

D – Documented disinformation campaigns in Africa²⁶¹

Target Country	Year Started	Key Actors	Objectives	Tactics	Impact
Global (targeting South Africa, Ghana, and Nigeria)	2022	Undetermined (pro-Russia)	<ul style="list-style-type: none"> • Spread pro-Kremlin narratives of Russia's invasion of Ukraine • Create the appearance of global support in the buildup to the UN vote to condemn the invasion 	<ul style="list-style-type: none"> • Thousands of new, fake, and hacked accounts began a massive, coordinated campaign on March 2, 2022, to artificially game Twitter's algorithm so that two pro-Russian hashtags would trend 	<ul style="list-style-type: none"> • 23 million tweets posted the hashtags #IstandwithPutin #IstandwithRussia (primarily in BRICS countries)
Nigeria	2022	Undetermined (pro-Russia)	<ul style="list-style-type: none"> • Spread pro-Kremlin narratives of Russia's invasion of Ukraine 	<ul style="list-style-type: none"> • The social media accounts of authentic Nigerian journalists and social media users were hacked through the platform Buffer • Once accessed, these accounts were used to post pro-Russian propaganda 	<ul style="list-style-type: none"> • Through Buffer, 1,552 accounts were accessed, out of which 618 accounts were used to post 766 unauthorized messages across Twitter, Facebook, and LinkedIn • Significant follow-on sharing of Russian propaganda was reported
Mali	2021	Wagner Group (Russia)	<ul style="list-style-type: none"> • Spread anti-French, anti-UN, and pro-Russian messages • Burnish Wagner's human rights record prior to its arrival in Mali 	<ul style="list-style-type: none"> • A coordinated campaign of false and misleading messaging appeared on Twitter, TikTok, Telegram, WhatsApp, and Facebook • Moderation was circumvented by using puns with multiple meanings 	<ul style="list-style-type: none"> • Fake photos were disseminated to the 5,000 members of one Telegram channel alone
Kenya	2021	Undetermined. Operated through opaque private companies during the High Court of Kenya's review of constitutional amendments relating to the Building Bridges Initiative (BBI)	<ul style="list-style-type: none"> • Control the narrative around the judicial review of BBI • Tarnish the integrity and competence of the High Court • Discredit targeted journalists and activists • Distort public opinion around the release of the Pandora Papers 	<ul style="list-style-type: none"> • Individuals were paid to post synchronized malicious content to game algorithms into making the content trend on Twitter (astroturfing) • Activities were coordinated on WhatsApp and paid for through M-Pesa to avoid detection • Verified users were paid to "rent" their accounts 	<ul style="list-style-type: none"> • Consisting of 3,7000 accounts, this network spread 23,000 tweets and 31 artificial hastags • Journalists and activists reported being harassed and resorting to self-censorship
Mali, Burkina Faso, and Niger	2020	Groups claiming to be nonprofits, charities, and community pages	<ul style="list-style-type: none"> • Denigrate democratically elected leaders to soften the ground for the military coups • Promote military juntas and delay holding elections • Advocate for a "revolution" in the broader Sahel region 	<ul style="list-style-type: none"> • Facebook pages posted coordinated and misleading pro-Russian and anti-French/Western content • One-third of posts across the pages were posted within 60 seconds of one another in the buildup to Mali's 2020 coup and the arrival of Wagner mercenaries in Mali 	<ul style="list-style-type: none"> • These pages were followed by 140,000 accounts and posted 24,000 times

²⁶¹. "Mapping Disinformation in Africa", *Africa Center for Strategic Studies*, May 13, 2022, <https://africacenter.org/>.

Target Country	Year Started	Key Actors	Objectives	Tactics	Impact
Africa-wide, especially Mali, CAR, Cameroon, South Africa, and Mozambique	2019	African influencers backed by Prigozhin/Russian-affiliated entities	<ul style="list-style-type: none"> Promote antidemocratic, anti-EU, anti-UN narratives through African voices. This network has been especially vocal promoting Russian propaganda around its invasion of Ukraine 	<ul style="list-style-type: none"> Recruitment, instruction, and financing of African social media influencers, intellectuals, and media figures starting at the Sochi Summit Influencers promote Russian disinformation on social media, radio, and television shows (such as Lengo Songo, Radio Révolution Panafricaine, and Afrique Média TV), and in the publications of Russian-backed “think tanks” (such as AFRIC). Much of this content comes directly from Russian state media outlets such as RT and Sputnik. RT registered at least four new African domain names prior to Russia’s invasion of Ukraine and plans to set up an editorial office in Nairobi, Kenya 	<ul style="list-style-type: none"> Widespread direct and indirect exposure of Africans to these messages Over 600 African news websites picked up Sputnik and RT content “as normal sources”
Tanzania	2021	Accounts supportive of the Tanzanian government	<ul style="list-style-type: none"> Silence opposition and civil society leaders by gaming Twitter’s moderation of copyrighted material in order to have these leaders’ accounts removed from the platform 	<ul style="list-style-type: none"> 268 accounts connected to the Tanzanian ruling party (and formerly used as Russian personas) coordinated adversarial reporting to harass Tanzanian opposition and civil society leaders Fake web pages were created with the targeted leaders’ content, after which copyright complaints were submitted leading to the removal of the leaders’ accounts These accounts also promoted pro-government hashtags and amplified government accounts 	<ul style="list-style-type: none"> Twitter removed at least two of the civil society leaders’ accounts Other leaders were intimidated by the harassment
Eritrea	2021	Scholar connected to the ruling party	<ul style="list-style-type: none"> Deny allegations of Eritrean forces’ abuses in Tigray 	<ul style="list-style-type: none"> A pseudo-fact-checking report was published to disingenuously claim bias The report was later promoted by Eritrean and Ethiopian officials The report accused western media and officials of disinformation 	<ul style="list-style-type: none"> Leaked audio allegedly captured Eritrean officials praising this report and encouraging similar efforts along these lines to support its denials
Ethiopia	2020	Diaspora supporters of Ethiopian or Tigrayan forces during conflict	<ul style="list-style-type: none"> Shape the narrative of the Tigray conflict 	<ul style="list-style-type: none"> “Click-to-tweet” campaign of supplying pre-written sensational social media posts for users to post and direct at international actors to game algorithms Creation of impersonator accounts 	<ul style="list-style-type: none"> A barrage of inaccurate and unverified information about the Tigray conflict confounded accurate analysis

Target Country	Year Started	Key Actors	Objectives	Tactics	Impact
Uganda	2020, leadup to January 2021 Presidential Election	Network of accounts linked to: 1) Ministry of Information and Communications Technology and National Guidance 2) A spokesperson for Lt. General Muhoozi Kainerugaba 3) Entities claiming to be public relations firms/news organizations	<ul style="list-style-type: none"> Disparage political opponents Disrupt opposition efforts to organize and share accurate election information on social media 	<ul style="list-style-type: none"> Fake and duplicate social media accounts posted fabricated claims about political opponents Accounts amplified one another's content 	<ul style="list-style-type: none"> The network reached a large following (over 10,000 followers) and a widespread reach on social media in the leadup to the election Uganda blocked social media prior to the election in response to Facebook removing the disinformation network
South Africa	2020	South African First party (nationalist political movement)	<ul style="list-style-type: none"> Promote xenophobic and Afrophobic sentiment 	<ul style="list-style-type: none"> Anonymous Twitter handle was created that deceptively claimed other people's images and artificially increased its follower count 	<ul style="list-style-type: none"> Gained over 50,000 followers and contributed to the growth of xenophobic groups and hashtags on South African social media
Algeria , Angola , Ghana , Mali , Mozambique , Niger , Nigeria , Senegal , Togo , Tunisia	2019	Israeli political marketing firm Archimedes Group and the political actors that hired them	<ul style="list-style-type: none"> Promote designated politicians while smearing others 	<ul style="list-style-type: none"> The campaign engaged in coordinated inauthentic behavior on Facebook, including creating fake and misleading "fact-checking" pages and "leak" pages that posted fake information about politicians 	<ul style="list-style-type: none"> Globally the network of inauthentic pages was followed by 2.8 million users
Nigeria and Egypt	2019	Private firms, MintReach based in Nigeria, and Flexell in Egypt	<ul style="list-style-type: none"> Promote positive content about the UAE, including its activity in Yemen Promote criticism of Qatar, Turkey, and Iran, as well as the Iran nuclear deal 	<ul style="list-style-type: none"> The campaign spread coordinated inauthentic content 	<ul style="list-style-type: none"> Nearly 500 accounts, groups, and pages gained a total of 1.4 million followers
South Africa	2019 election	Prigozhin/AFRIC (Russia)	<ul style="list-style-type: none"> Support the re-election of the ANC Party and deepen Russian ties with its leaders 	<ul style="list-style-type: none"> Plan to spread disinformation that would discredit the Democratic Alliance Party and Economic Freedom Fighters 	<ul style="list-style-type: none"> Uncertain
Global including Chinese embassies in 27 African countries. Those with greatest artificial amplification were: Angola, Liberia, South Africa, Ghana, Malawi, Namibia, Botswana, Djibouti, Mali, Chad	2018	China	<ul style="list-style-type: none"> Artificially amplify the messages of the Chinese Central Propaganda Department 	<ul style="list-style-type: none"> Chinese officials amplified state-run media reports Armies of fake accounts then boosted officials' posts through retweets 	<ul style="list-style-type: none"> Chinese diplomats in a majority of African countries had their tweets artificially amplified Tens of thousands of fake retweets Twitter suspended 30,000 accounts linked to this campaign

Target Country	Year Started	Key Actors	Objectives	Tactics	Impact
The Democratic Republic of the Congo	2020	Congolese politician, Honoré Mvula, and his political party, Force des Patriotes	<ul style="list-style-type: none"> • Build followers for Mvula and his political party 	<ul style="list-style-type: none"> • Inauthentic social media accounts managed by university students ran pages posting sensational news, which were then opaquely rebranded to support Mvula 	<ul style="list-style-type: none"> • 1.5 million likes were accumulated from the pages
Guinea	Leadup to October 2020 election	President Alpha Condé's political party: the Rally of the Guinean People and its network of paid political communicators	<ul style="list-style-type: none"> • Flood Facebook in Guinea with pro-Condé content in the leadup to his controversial bid for a third term 	<ul style="list-style-type: none"> • Coordinated content was promoted on Facebook through a large network of accounts and pages with fake names, which did not disclose that they were paid political communicators for Condé's party • Several page administrators were based in Turkey 	<ul style="list-style-type: none"> • Content reached 800,000 followers in a country of 13 million people
Sudan	2019, 2021	Prigozhin-linked entities and Russia's Internet Research Agency	<ul style="list-style-type: none"> • Promote Russia and Prigozhin as friends of Sudan • Support Sudan's Rapid Support Forces • Portray Sudan's civilian leaders as pawns of the United States 	<ul style="list-style-type: none"> • Fake social media accounts claimed to be Sudanese politicians or media organizations • Sudanese citizens were hired to operate some of these pages 	<ul style="list-style-type: none"> • The disinformation network gained a following of over 440,000 user accounts
Togo and Côte d'Ivoire	2019 and 2020	Tunisian digital communications firm Ureputation	<ul style="list-style-type: none"> • Promote the controversial election bids of longtime Togo President Faure Gnassingbé in February 2020 and that of former president Henri Bédié in Côte d'Ivoire in October 2020 • Additional pages targeted Chad, Comoros, Congo-Brazzaville, Gambia, Guinea, Mali, Niger, and Senegal 	<ul style="list-style-type: none"> • Coordinated inauthentic content was spread through networks of fake accounts that posed as locals and independent news organizations in the countries targeted 	<ul style="list-style-type: none"> • 900 accounts, groups, and pages affiliated with the UReputation operation had a combined 3.8 million followers
Somalia	2019	Private firms based in Egypt and UAE	<ul style="list-style-type: none"> • Pushed claims that the Qatar government had sponsored terror attacks in Somalia as part of Gulf State competition in the Horn of Africa 	<ul style="list-style-type: none"> • Created false claims of Qatar sponsorship of terrorist attacks, which were amplified via pages posing as regional news outlets 	<ul style="list-style-type: none"> • Pages had more than 13.7 million followers across North Africa and the Middle East
Cameroon, CAR, Côte d'Ivoire, DRC, Madagascar, Mozambique, and Sudan	2018	Russian entities linked to Yevgeny Prigozhin	<ul style="list-style-type: none"> • Provide political cheerleading for ruling party candidates • Fan anti-French sentiment • Champion Russia and Russian interests, especially around mineral extraction and arms deals 	<ul style="list-style-type: none"> • Disseminate coordinated inauthentic content through fake accounts based abroad and "franchised" national accounts (where locals are paid to post) 	<ul style="list-style-type: none"> • The inauthentic pages posted 48,000 times, received more than 9.7 million interactions, and were liked by over 1.7 million accounts
South Africa	2016	Bell Pottinger, British PR firm retained by Gupta brothers (accused of massive corruption as part of state capture scandal)	<ul style="list-style-type: none"> • Stoke racial animosity to distract from the Gupta's role in state capture 	<ul style="list-style-type: none"> • Campaign involved 100 fake Twitter accounts and bots to generate 220,000 tweets to amplify hate-filled websites and speeches • Content was amplified by media outlets owned by the Gupta brothers 	<ul style="list-style-type: none"> • Disinformation damaged trust and dialogue around issues of economic reform in South Africa – features that continue to shape South African political discourse
Libya	2014	External interests in Egypt, Russia, Saudi Arabia, and the United Arab Emirates	<ul style="list-style-type: none"> • Promote Libyan warlord Khalifa Haftar • Advance pro-Russian narratives of the Libyan conflict • Sow polarization, confusion, and distrust in Libyan digital spaces 	<ul style="list-style-type: none"> • Networks based in the UAE and Saudi Arabia created fake Twitter accounts posing as Libyans • Wagner Group affiliates hired Libyans to produce disinformation around the Libyan conflict 	<ul style="list-style-type: none"> • Disrupted Libya's nascent digital information networks • Amplified the polarization of Libyan society

E – Census of metaverses in Sub-Saharan Africa

▪ a) The "Micro-Folie" gallery

Under the auspices of the Ivorian Ministry of Culture and Francophonie as well as the Parisian cultural park of La Villette, the first digital art gallery "Micro-Folie" was opened at the French Institute of Ivory Coast in November 2020 to allow visitors to virtually contemplate French and international artworks.²⁶²

▪ b) Africa's first digital museum, Discovery Museum

This one was established in 2021 in Nigeria. Its founder, Mosope Olaosebikan, clearly states his ambitions: "to stimulate innovation, fuel creativity and transform minds"²⁶³ by "shaping the cultural and human narrative in its own way through the use of immersive and innovative methods of heritage preservation, such as augmented reality (AR) and virtual reality (VR)"²⁶⁴.

▪ c) Metaverse Magna (MVM)

This Nigerian blockchain gaming platform raised \$3.2 million in September 2022, valuing the company at around \$30 million²⁶⁵. MVM's goal is to create the continent's largest decentralized autonomous organization (DAO) to allow players to govern their own Alien Worlds communities, "the world's most popular blockchain game with nearly 11 million daily transactions and 700,000 monthly active users."²⁶⁶ Founded on the goal of bringing important aspects of real life into the digital world, the Alien Worlds community of players and developers is a veritable "social metaverse"²⁶⁷ and is seeking, particularly in Africa, to design smartphone-friendly interfaces to allow users to more easily access a wider range of community activities

▪ d) Africarare Ubuntoland²⁶⁸

Developed by South African agency Mann Made, this first exclusively African metaverse launched in October 2021 aims to enhance the folklore and traditional representations of the continent. The buildings of Ubuntoland are indeed representative of traditional African architecture. African art, fashion and entertainment are also omnipresent and highlighted in an art gallery. The purchase of 144 virtual plots of land by Africa's largest mobile network operator, MTN Group²⁶⁹, illustrates the success of this space where land can be sold, bought and rented. Ubuntoland also connects businesses and individuals and has its own currency,

²⁶². Bénédicte Vera-Cruz, "« Micro-folie », la galerie d'art virtuelle s'installe pour la première fois en Afrique de l'Ouest", Agence Ecofin, December 01, 2020, <https://www.agenceecofin.com/audiovisuel/0112-83030-micro-folie-la-galerie-d-art-virtuelle-sinstalle-pour-la-1re-fois-en-afrique-de-l-ouest>.

²⁶³. "Our pillars", Discovery Museum. Accessed March 03, 2023, <https://discoverymuseum.ng/about-spa.html>.

²⁶⁴. Balkissa Idé Siddo, *op.cit.*

²⁶⁵. Muktar Oladunmade, Caleb Nnamani, "Nestcoin's Metaverse Magna raises \$3.2 million to build Africa's largest gaming community", Techcabal, September 05, 2022, <https://techcabal.com/2022/09/05/nestcoins-metaverse-magna-raises-3-2-million-to-build-africas-largest-gaming-community/>.

²⁶⁶. "Alien Worlds devient le jeu blockchain le plus populaire avec 11 millions de transactions quotidiennes, selon DappRadar", MediaConnect, October 27, 2021, <https://mediacconnect.com/alien-worlds-devient-le-jeu-blockchain-le-plus-populaire-avec-11-millions-de-transactions-quotidiennes-selon-dappradar/>.

²⁶⁷. *Ibid.*

²⁶⁸. "Welcome yo Ubuntoland step into virtual Africa". Accessed March 03, 2023, <https://www.africarare.io/>.

²⁶⁹. Balkissa Ide Siddo, "Understanding the Metaverse – Africa's Role", Africa Business.com, June 7, 2022, <https://africabusiness.com/2022/06/07/understanding-the-metaverse-africas-role/>.

\$UBU Coin, built on the Ethereum blockchain²⁷⁰. For Mic Mann, co-founder and CEO of Africarare, "our metaverse will connect Africa to this burgeoning arena of the global economy, spur growth, and create multiple new jobs such as designers, creators, and digital architects"²⁷¹.

- **e) African Metaverse Museum**

This new universe created in 2022 aims to develop spaces and experiences for Africans and the black diaspora in the metaverse.

- **f) Metaverse Vanhille²⁷²**

A metaverse alternative aimed at the French-speaking African entrepreneurial community, this universe is inspired by Senegalese architecture.

- **g) Africa Metaverse Summit**

In June 2022, the online organization of this first summit dedicated to the metaverse by the Tunisian school NETINFO²⁷³ and international sponsors²⁷⁴ unveils the ambition "Let's Build the African Metaverse Community" to bring the continent into the global digital economy.

- **h) Africa Metaverse Tribe (AMT)²⁷⁵**

This universe is a continuation of the first metaverse summit and the *AfricanGameDev* program sponsored by Epic Games Studios and was able to federate a community of video game developers from 18 African countries²⁷⁶ to produce prototypes of games with storytelling. The AMT is built around two distinct and complementary components: 1) a Think Tank to create a charter and action plan for the African metaverse, 2) the "Metaverse Academy", launched in July 2022, to train developers aged 18 to 30 from across the continent for free²⁷⁷.

- **i) Meta's commitment**

Finally, the recent opening of the group's second office in Africa demonstrates its growing interest in the continent. This office, located in Lagos, Nigeria, is the first on the continent to

²⁷⁰. "How can the metaverse bolster African culture in the global scene?", METASEUM.space, June 8, 2022, <https://metaseumspace.medium.com/how-can-the-metaverse-bolster-african-culture-in-the-global-scene-e2dd5c701de3>.

²⁷¹. Barthelmess, Benedikt and Langlois, Jean. "Development of Blockchain-based infrastructure: Comparative perspectives from Asia and Africa, RIPE, 2018 ; Barthelmess, Benedikt and Langlois, Jean. Tokenomics: Emerging strands of research, RIPE, 2018 ; Barthelmess, Benedikt and Langlois, Jean. "Digital identity: legal and economic issues", RIPE, 2018

²⁷²François Vanhille, "Métavers en Afrique francophone", November 21, 2022, <https://francoisvanhille.wordpress.com/2022/11/21/metavers-en-afrique-francophone/>.

²⁷³. NETINFO was created in 1999 in Tunisia. This art and technology school is specialized in training for the coding and production of 3D computer graphics. Oriented towards video games, animation, virtual and augmented reality, special effects, design, architecture and engineering, it has trained nearly 15,000 students and professionals from more than 15 countries (Tunisia, Morocco, Algeria, Sudan, Cameroon, Ivory Coast, Gabon, Senegal, Benin, Togo, Belgium, France ...).

²⁷⁴. These sponsors include Epic Games, Autodesk, Nvidia, Binance, the Tezos Foundation as well as African partners in the digital and creative industries such as Africa in Colors, Afric'Up, Digiart Living Lab, ...

²⁷⁵. "Africa Metaverse Tribe". Accessed on March 04, 2023, <https://www.africangamedev.com>.

²⁷⁶. Tunisia, Cameroon, Rwanda, Kenya, South Africa, Mali, Benin, Gabon, DRC, Ivory Coast, Congo, Senegal, Ghana, Burkina Faso, Niger, Togo, Morocco and Libya.

²⁷⁷. Thierry Barbaut, "African Metaverse Summit", Info Afrique, June 1, 2022, <https://www.info-afrique.com/african-metaverse-summit/>.

have a team of engineers to support the Sub-Saharan region. In addition, Meta has also invested \$50 million over two years to fund a research fund and a project entitled "Future Africa: Telling Stories, Building Worlds"²⁷⁸. The infographic in [Appendix F](#) captures the whole group's investments and flagship initiatives for 2022.

²⁷⁸. Balkissa Ide Siddo, *op. cit.*

F – Infographic²⁷⁹: META Africa 2022 Year in Review²⁸⁰

Some of the key 2022 Meta Africa Year in Review highlights include:

Facebook Reels – Launched Facebook Reels across 20 countries in Sub-Saharan Africa to help creators monetise their crafts, connect with, and discover new audiences in News Feed and Groups.

Facebook Protect – Rolled out Facebook Protect in Mauritius and South Africa, a programme designed to provide increased protections around the world for journalists, activists and human rights defenders.

#StaySafeOnInstagram in Ghana and Nigeria – Unveiled an education campaign focused on enabling users to take steps to protect their accounts from phishing and hacking.

Economic Impact Trainings – Trained over 107,000 SMBs and Non-profits across Sub-Saharan Africa through Meta’s Economic and Social Impact Programs including Meta Boost, SheMeansBusiness and Meta Nonprofit Training Program.

WhatsApp’s first-ever global brand partnership – Launched with Nigerian-born NBA All-Star Giannis Antetokounmpo, this featured a short film about his Nigerian roots – titled “Naija Odyssey”.

“Future Africa: Telling Stories, Building Worlds” – In partnership with Africa No Filter, announced the six finalists of the program aimed at boosting the use of Virtual Reality in Africa’s storytelling.

#ReelAdventures – Created #ReelAdventures aimed at highlighting adventure-focused groups in Kenya who use reels to express themselves and share their travel experiences.

#NoFalseNewsZone – Launched a campaign and comic books across Ghana and Francophone Africa, aimed at helping people to think critically about the messages they see and read online.

Made in Africa, Loved by the World – Unveiled our 2022 international campaign aimed at celebrating Africa’s ongoing growing cultural impact on the world, whilst spotlighting eight amazing creators and innovators from across the continent, including rolling out Africa’s first Instagram #AfricaMade Reels challenge.

No Language Left Behind – Unveiled our single AI model that translates over 200 languages, including 56 African languages.

Creators of Tomorrow – Spotlighted and celebrated emerging talent from around the world who are inspiring a new movement of creative content online, including here in Africa.

²⁷⁹ . Download document: <https://bit.ly/3CiJvZ5>

²⁸⁰ . Ogbonna Oruh, “Meta releases Sub-Saharan Africa ‘2022 Year in Review’ highlighting key milestones across the region”, December 24, 2022, <https://businesstraffic.com.ng/meta-releases-sub-saharan-africa-2022-year-in-review-highlighting-key-milestones-across-the-region/>.

2Africa Deployment Genoa Landing – Alongside eight local and global partners, announced the landing of the 2Africa subsea cable system to Genoa, Italy which now connects three continents — Africa, Europe, and Asia, making it the longest subsea cable system ever developed at more than 45,000 kilometres.

AMBER Alerts in Nigeria – In partnership with the National Agency for the Prohibition of Trafficking in Persons (NAPTIP), launched AMBER Alerts, a programme aimed at helping to find abducted children by sending AMBER Alerts to the local Facebook and Instagram community.

Launched ‘My Digital World’ in Cameroon – Rolled out a digital literacy program aimed at educating users on responsible social media usage and how to stay safe online.

NFT Digital Collectibles expansion across Sub-Saharan Africa on Instagram – Enabled creators to share their digital collectibles on Instagram, including how to leverage their fanbase to monetise their craft.

AR/VR Africa Metathon – Partnered with Imisi 3D and Black Rhino VR to launch an AR/VR Africa Metathon across Africa, aimed at supporting African XR talent to build innovative solutions.

Flex Naija – Launched ‘Flex Naija’ – Meta’s first campaign in Africa, inspiring Nigeria’s creators to be amongst the first to flex in the metaverse.

Digital Literacy Trainings – Trained over 80,000 participants (youth, educators and the general public) through ‘My Digital World’, Meta’s Flagship Digital Literacy Program for responsible and safe use of digital platforms in over 9 countries.

G – Case studies

◆ Existing jihadist games

To explore the potential of video games in Africa, we analyzed various games created or adopted by jihadists. As American researcher Javier Lesaca found when analyzing 845 pieces of Islamic State propaganda, “more than 15% are directly inspired by real movies, video games, and video clips from contemporary popular culture, such as the movies *Saw*, *The Matrix*, *American Sniper*, and *V for Vendetta*; or video games such as *Call of Duty*, *Mortal Combat X*, and *Grand Theft Auto*”²⁸¹.

▪ Case study 1: Quest for Bush

The first video game developed by jihadists was *Quest for Bush*. It went viral on the Internet in September 2006 and caused international concern. Inspired by the games *Quest for Al-Qaeda* (released after the September 11, 2001 attacks) and *Quest for Saddam* (released after the 2003 Iraq War), *Quest for Bush* is a primitive point-and-shoot FPS (first-person shooter) game similar to *Wolfenstein* and *Doom*. In the scenario, the player walks through what appears to be an American military camp with pictures on the walls of President Bush, Secretary of Defense Donald Rumsfeld, and British Prime Minister Tony Blair. At the time, it was the only video game officially published directly by a jihadist. The publishing media platform, the Global Islamic Media Front, was in fact directly linked to al-Qaeda.



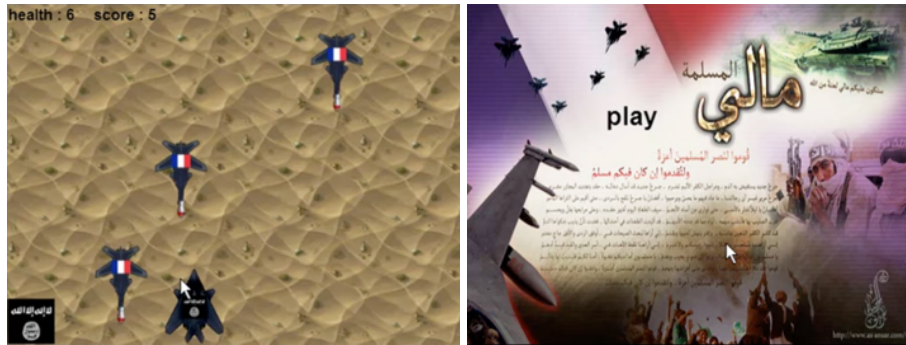
▪ Case study 2: Muslim Mali

In March 2013, a video game called “Muslim Mali” was recently posted online by two members named Ta’ir Al-Nawras and Ghareeb Fi Al-Hayat²⁸². Discovered by the Middle East Media Research Institute (Memri) on the forum of the jihadist website Ansar al-Mujahidin, this online game, which simulates aerial combat, is a response to the French military campaign in Mali. The player actually flies a jet in the colors of the black flag of al-Qaeda

²⁸¹. Javier Lesaca, “On social media, ISIS uses modern cultural images to spread anti-modern values”, Brookings, September 24, 2015, <https://www.brookings.edu/blog/techtank/2015/09/24/on-social-media-isis-uses-modern-cultural-images-to-spread-anti-modern-values/>.

²⁸². “Aqmi a conçu un jeu vidéo pour désintégrer l’armée française au Mali”, *France 24* online, March 13, 2013, <https://www.france24.com/fr/20130313-djihad-jeu-video-mali-armee-francaise-avion-al-qaida-forum-islamiste>.

fighting French planes. A propaganda tool, this game embodies virtual jihad through the messages it sends: "Muslim brother, go and repel the French invasion of Muslim Mali".



▪ Case study 3: The Clanging of the Swords

In September 2014, Islamic State supporters released a video game called "The Clash of Swords (Salil al-Sawareem / The Clanging of the Swords)", an imitation of the popular Grand Theft Auto (GTA) video game series. A year later, in September 2015, a second edition, "The Clashing of the Swords 2," was released online, along with several clips from the game on YouTube. Using the "troll, flame, and engage" technique, the Islamic State sought to achieve a dual goal through this game: first, to gain publicity, and second, to draw attention to the group, especially among young people.



▪ Case study 4: Arma 3

In 2015, supporters of the Islamic State developed a modified amateur version ("mod") of Arma 3, a military game popular around the world, from the Czech studio Bohemia Interactive (2013)²⁸³. In this version, the user can choose to play as a fighter against the Peshmerga and the Syrian army. Other versions of the game offer to play as terrorists of the

²⁸³. Wiliam Audureau, Madjid Zerrouky, "Un mod d'ArMA 3 récupéré par la propagande de l'Etat islamique", *Le Monde* online, February 05, 2015, https://www.lemonde.fr/pixels/article/2015/02/05/un-mod-d-arma-3-recupere-par-la-propagande-de-l-etat-islamique_4570415_4408996.html.

group Boko Haram. More recently, a new hijacking of the game in connection with the conflict in Ukraine has made headlines: a video showing helicopters and fighter jets sent by NATO to help Ukraine was posted on YouTube on April 26, 2022, and was distributed only by Chinese media. Although the author of the published video claimed that it was shot in the Ukrainian city of Kharkiv, a reverse image search showed that it had no connection to the ongoing conflict. In fact, it was taken from this video game²⁸⁴.



Mod of Arma 3 with Boko Haram



Mod of Arma 3 with the fighters of the EI

- Case study 5: the application with the educational game "Huroof"

This application, distributed on Android in May 2016 by the publisher Al-Hima Library, is one of the most famous educational games ("serious games") associated with the Islamic State. It was developed to gamify Arabic language learning for young children and to "strengthen commitment to the ideologies, goals, and objectives of the Islamic State"²⁸⁵. As Lakomy showed in 2019, this app "combined bright colors, images of grass, trees, clouds, trains, balloons, as well as other 'classic' graphics used in children's books, with a 'militaristic vocabulary', [...] illustrations of guns, bullets, rockets, cannons or tanks"²⁸⁶. If the use of "cute" images is part of the so-called "meme war", it is above all a way of conditioning minds and waging a cognitive war from the earliest age.

♦ *Hypotheses on the Wagner Group in Sub-Saharan Africa*

It is difficult to predict exactly how the Wagner group, or any other group, might use the metaverse and online games to influence African populations and conduct cognitive operations online. However, it is possible to explore some potential avenues and strategies that could be used.

First, the Wagner group could create virtual environments that simulate real-world events and situations in order to manipulate public opinion and influence decision-making. In line with

²⁸⁴. Dominique Desauvay, "Ukraine : les extraits du jeu vidéo Arma 3 alimentent la désinformation en ligne", RFI, January 4, 2023, <https://www.rfi.fr/fr/technologies/20230104-ukraine-les-extraits-du-jeu-vid%C3%A9o-arma-3-alimentent-la-d%C3%A9sinformation-en-ligne>

²⁸⁵. Suraj Lakhani, Susann Wiedlitzka, "'Press F to Pay Respects': An Empirical Exploration of the Mechanics of Gamification in Relation to the Christchurch Attack", *Terrorism and Political Violence*, May 31, 2022, pp. 1–18, <https://doi.org/10.1080/09546553.2022.2064746>

²⁸⁶. Miron Lakomy, "Let's Play a Video Game : Jihadi Propaganda in the World of Electronic Entertainment", *Studies in Conflict & Terrorism*, 2019, 42 (4), 383-406, DOI : 10.1080/1057610X.2017.1385903

actions taken on social networks, the group could use this platform to promote its own interests or to undermine the influence of other foreign powers.

Second, Wagner could use the video game industry as a tool for influence operations. Building on the success of propaganda videos on social networks, the group could potentially create games or content that promote its own ideology and messages, or portray its enemies in a negative light. It could also use gaming communities as a sounding board for disinformation or intelligence gathering.

In addition, the Wagner group could use social media and other online platforms to increase its outreach to specific audiences in Africa. By analyzing user data and online behavior, Wagner could identify vulnerable or influential individuals and target them with tailored messages or propaganda.

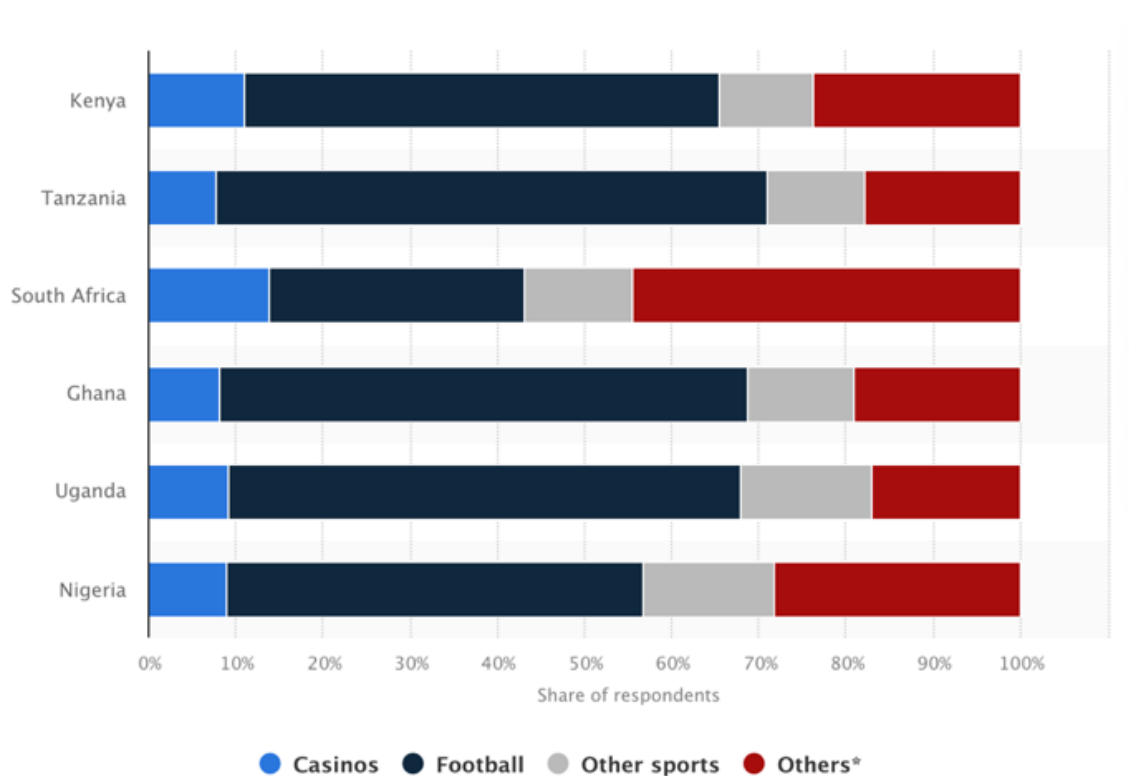
As Jean Langlois-Berthelot reminds us²⁸⁷, it is important to note that these strategies are not unique to the Wagner group and have been used by other groups and countries to conduct online influence operations. Moreover, the use of these strategies, which are often illegal and unethical, can have serious consequences for the targeted populations.

²⁸⁷. Dr. Jean Langlois-Berthelot, interview on February 15, 2023.

H – Graphs

Theses graphs helped us in our research, and so we present them here for interested parties.

♦ *Energy disparities*



Preferred types of gambling among the youth in Africa as of 2021, by country²⁸⁸

²⁸⁸. Lars Kamer, “Preferred Types of Gambling Among the Youth in Selected African Countries”, Statista, <https://www.statista.com/statistics/1305056/preferred-types-of-gambling-among-the-youth-in-africa/>.

◆ *Russia's objectives in online entertainment*

I. Implementation of a Russian strategy of influence in Africa: political support, military operations and "anti-imperialism"

A. Russian-African rapprochement since independence
From Russian political support in Africa to African political support to Russia

- Member of the world communist system from 1964 to 1992
- Member of the BRICS (diplomatic conference created in 2011 bringing together Brazil, Russia, India, China and South Africa)
- Vote at the UN General Assembly to condemn Russia for its invasion of Ukraine (March 3, 2022):
 - GAM. Country that voted for
 - NAMIBIA Country abstaining
 - G.-B. Country having preferred not to take part in the vote
 - ÉRYTHÉE Country having voted against

Intensifying trade relations: Russian interest in the Mediterranean coast and East Africa

- Russia's main economic partner
- Main Russian economic interests in Africa :
 - Nuclear cooperation agreements with Rosatom
 - Mining agreements
 - Energy agreements (hydrocarbons)

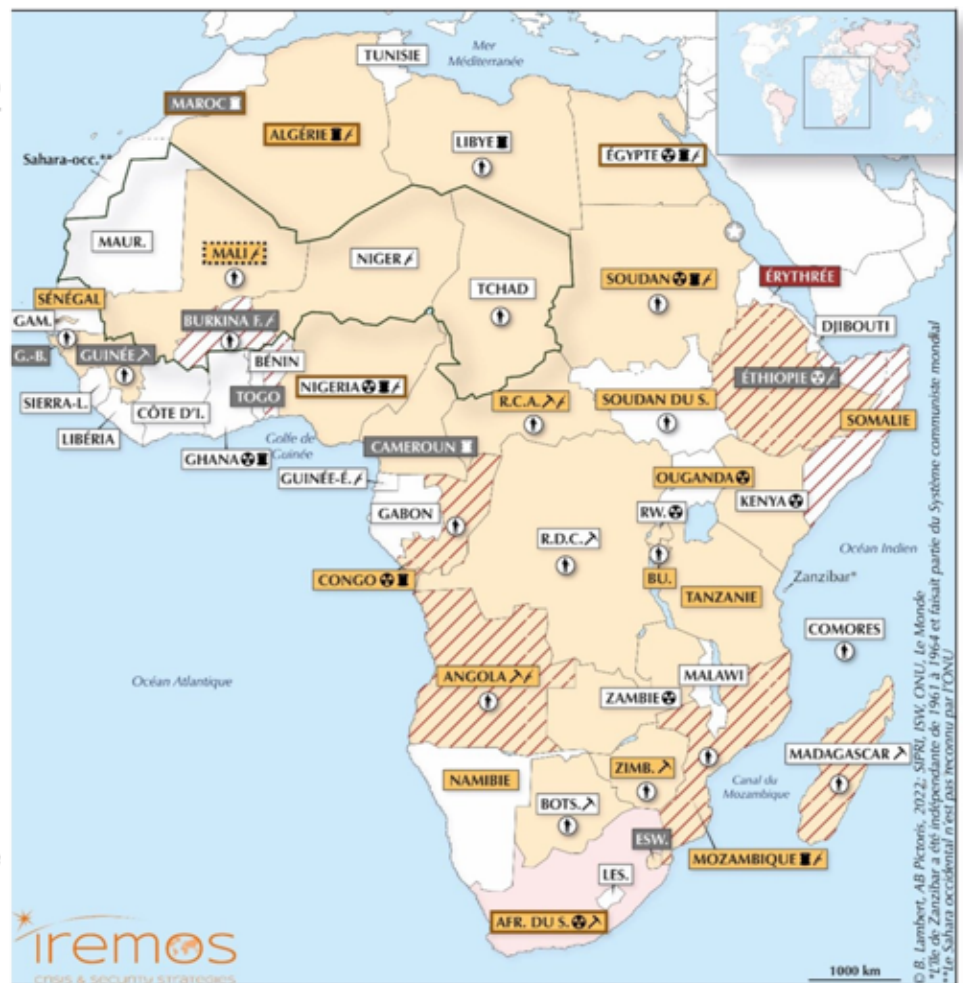
B. Military cooperation and the presence of MMPs in a post-colonial space

Russia, a pillar in the field of defense in Africa

- Importer of Russian arms
- Countries with military cooperation agreements with Russia
- Likely Russian military base on the Sudanese coast (discussions with the Sudanese government to resume in 2022)

Armed presence against a background of "anti-French" sentiment

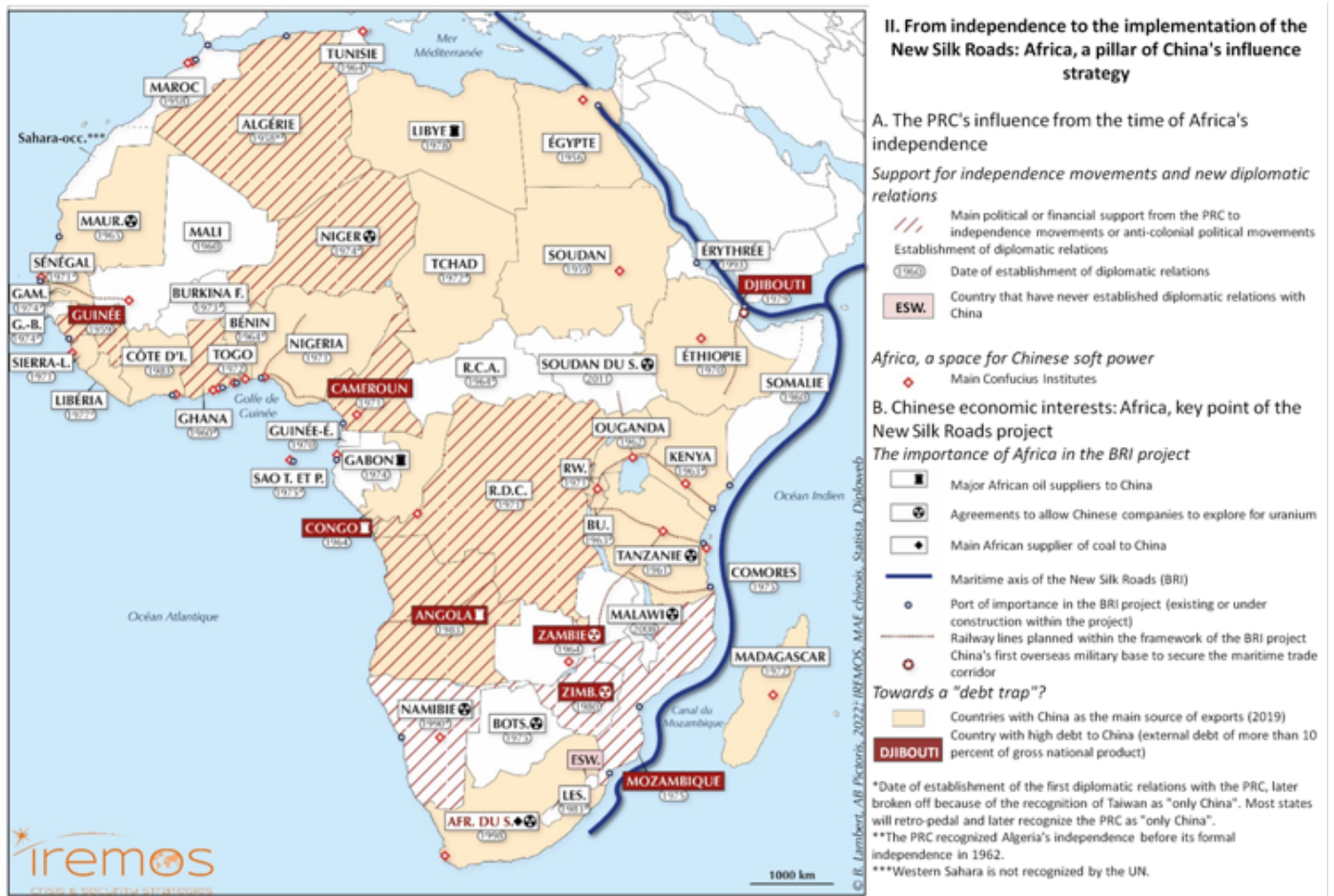
- Presence or indications of presence of the Wagner group (Russian SMP)
- Perimeter of the French military operation Barkhane (2014-2022)
- State in which "anti-French" demonstrations took place in 2022
- Departure of French forces after nearly 10 years in the country (as part of Operation Serval and then Barkhane)



Russian influence strategy: ideology, economic interests and military cooperation²⁸⁹

²⁸⁹. Iremos, November 29, 2022, <https://www.iremos.fr/>.

◆ *China's early influence in Africa*



Chinese influence strategy: ideology, economic interests and military cooperation²⁹⁰

²⁹⁰. Iremos, November 29, 2022, <https://www.iremos.fr/>.

◆ *Huawei facial recognition in Africa*



Map of African countries with Huawei facial recognition technology²⁹¹

◆ *Huawei facial recognition in Africa*

REVENUES (\$ - MILLIONS)					
Region	Segment	2022	2023	2024	2025
Sub-Saharan Africa	Total Revenues	\$ 862.8M	\$ 998.1M	\$ 1,133.9M	\$ 1,254.4M
	PC Revenues	\$ 49.4M	\$ 53.2M	\$ 53.2M	\$ 60.4M
	Browser PC Revenues	\$ 3.9M	\$ 3.6M	\$ 3.3M	\$ 3.1M
	Download/Boxed PC Revenues	\$ 45.5M	\$ 49.6M	\$ 53.6M	\$ 57.3M
	Mobile Revenues	\$ 778.6M	\$ 907.3M	\$ 1,036.0M	\$ 1,149.8M
	Apple App Stores Revenues	\$ 204.6M	\$ 245.6M	\$ 289.5M	\$ 336.8M
	Android Stores Revenues	\$ 574.0M	\$ 661.7M	\$ 746.5M	\$ 812.9M
	Console Revenues	\$ 34.8M	\$ 37.7M	\$ 40.9M	\$ 44.2M

Outlook for the video game market in Sub-Saharan Africa for the period 2022 - 2025²⁹²

²⁹¹. Julie Montcouquiol, “L’offensive chinoise avec les villes numériques”, *Ecole de Guerre Economique*, March 18, 2022, <https://www.egge.fr/infoguerre/loffensive-chinoise-avec-les-villes-numeriques>.

²⁹². “State of the African Games Industry 2023”, Games Industry Africa, January 23, 2023, <https://gamesindustryafrica.com/2023/01/23/state-of-the-african-games-industry-2023/>.

Region	Segment	2022 YoY	2022 - 2025 CAGR	2022 Global Share
Sub-Saharan Africa	Total Revenues	8.7%	13.3%	0.5%
	PC Revenues	7.0%	7.0%	0.1%
	Browser PC Revenues	-8.7%	-7.5%	0.2%
	Download/Boxed PC Revenues	8.6%	8.0%	0.1%
	Mobile Revenues	9.1%	13.9%	0.8%
	Apple App Stores Revenues	16.5%	18.1%	0.5%
	Android Stores Revenues	6.7%	12.3%	1.1%
	Console Revenues	2.4%	8.4%	0.1%

Outlook for the video game market in Sub-Saharan Africa for the period 2022 - 2025²⁹³

²⁹³. “State of the African Games Industry 2023”, Games Industry Africa, January 23, 2023, <https://gamesindustryafrica.com/2023/01/23/state-of-the-african-games-industry-2023/>.

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