Policy Brief

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Artificial Intelligence in Africa: Challenges and Opportunities

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The integration of Artificial Intelligence (AI) in Africa presents promising prospects and substantial challenges. While some countries on the continent stand out for their commitment and progress in preparing for AI adoption, others face significant obstacles such as structural inequalities and digital divides. This disparity highlights the need for an inclusive and holistic approach to ensure that all African countries can benefit from AI while closing the gap with other regions of the world.

To overcome these challenges and fully exploit AI's potential in Africa, a concerted effort is essential. This involves increased investment in digital infrastructure, specialized training, and Research and Development (R&D). Moreover, visionary government policies and strategic partnerships between the public sector, private sector, and civil society are necessary to create an environment conducive to innovation and AI-driven economic growth. By working together, African nations can turn current challenges into opportunities and pave the way for a future where AI contributes significantly to sustainable development and improved quality of life for all Africans.

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INTRODUCTION

Artificial Intelligence (AI) is at the forefront of technological innovation and is set to reshape the global economic landscape in unprecedented ways. Defined by its ability to simulate human intelligence through algorithms and computing power, AI promises to revolutionize industries, enhance operational efficiency, and open new avenues for growth. From autonomous vehicles to virtual assistants, predictive analytics, and robotic automation, AI applications span various sectors, including manufacturing, healthcare, finance, and transportation.

The rise of AI has sparked lively discussions among economists, policymakers, and business leaders regarding its potential implications for the global economy. On one hand, its proponents present AI as a catalyst for unprecedented productivity gains, innovation, and competitive advantages. AI-based technologies offer the possibility of optimizing business activities, improving decision-making processes, and fostering technological advancements. These developments, in turn, stimulate economic growth and prosperity by enabling companies to exploit resources more efficiently, respond more agilely to market needs, and create new opportunities for innovation and development. However, the advent of AI also raises questions and concerns about its impact on labor markets, socio-economic dynamics, and ethical considerations. The automation of routine tasks and the emergence of AI-powered systems threaten to disrupt traditional employment patterns, sparking fears of job displacement and widening income inequalities. Moreover, ethical dilemmas related to data privacy and algorithmic biases underscore the need for robust regulatory frameworks and ethical guidelines to govern the development and deployment of AI technologies.

It is therefore imperative to conduct an analysis of AI's impact on the global economy by examining its transformative potential, as well as the challenges and risks it entails.

CHAPTER 1: AI: CATALYST FOR ECONOMIC AND SOCIAL CHANGE

Artificial Intelligence has made great strides, progressively transforming our world in all aspects. This technological revolution has profound implications for the global economy, redefining growth models, employment structures, and interactions between economic actors. As AI capabilities evolve, it becomes a powerful driver of economic change, reshaping the foundations on which business activities and economic policies are built. This evolution is made possible by a combination of technological advancements, massive data volumes, and the rise of cloud computing, creating an ecosystem conducive to innovation and growth.

In this chapter, we will conduct an in-depth analysis of the impact of Artificial Intelligence on the global economy by exploring the many facets of its influence and the opportunities it offers to stimulate economic growth and promote social progress.

1.1 Positive impact of AI on the global economy

- **AI: A Driver of Transformation in the Public and Private Sectors**

Over the past decade, we have witnessed a significant evolution in AI, from traditional models to generative systems capable of creatively exploring and interpreting complex data. As highlighted by (Hervé Tourpe, 2023), this advancement opens up new opportunities in both the public and private sectors. In the public sector, governments have begun to integrate AI to improve citizen services and address workforce challenges. AI applications in public service range from the personalization of administrative services to the optimization of internal processes, leading to better efficiency and greater citizen satisfaction. For instance, AI-powered chatbots (virtual assistants) can provide quick and accurate answers to citizens' questions, enhancing their interactions with various administrations. A concrete example is the "Amelia" platform developed in France, which addresses citizens' queries regarding administrative procedures. Similarly, initiatives such as Estonia's e-residency system enable foreigners to establish businesses and manage taxes online through AI.

In the private sector, companies have also massively adopted AI to optimize operations, improve productivity, and offer more personalized products and services. The economic applications of AI in the private sector are vast, ranging from demand forecasting to inventory management and personalized marketing. Companies use AI to analyze customer data and anticipate their needs, enabling them to offer more tailored products and services, thereby increasing their competitiveness in the market. For example, Amazon uses AI to suggest specific products to customers by analyzing their purchases and preferences. This allows the e-commerce giant to offer more relevant products and boost sales.

Moreover, central banks have also leveraged AI to refine their economic forecasts and detect financial risks. By analyzing vast datasets in real time, AI models can help financial institutions better understand economic trends, predict market fluctuations, and make more informed monetary policy decisions. For example, the Athena tool analyzes and interprets the content of regulatory documents, cross-referencing it with information from other sources such as public media, providing regulators with deeper insights into banks and their risks. In terms of Big Data analysis, GABI generates and optimizes large-scale regression models, significantly expanding the range of available models and enabling more relevant comparisons. As for network analysis, NAVI produces diagrams illustrating the links within the data. Users can visualize the often complex ownership[1] structures of supervised banks and cross-reference data from multiple sources to gain an overview of holders and interdependencies (European Central Bank, 2024).

- **Contribution to Improving the Education System**

Artificial Intelligence plays a crucial role in improving the education system by offering innovative solutions to meet individual learners' needs. One of its major advances lies in personalized learning, where AI adjusts educational content based on each student's abilities and learning styles. This approach, highlighted by (Hwang et al. ,2020), accelerates learning, supports students with specific needs, and overall improves the quality of education. Furthermore, by enabling equitable access to education and providing personalized educational resources, AI has the potential to reduce learning inequalities. AI-

1. These complex properties may include governance structures, relationships between banks and their subsidiaries, networks of shareholders, and relationships between banks and other financial entities, as well as the links between banks' banking and non-banking activities' and their parent groups.

based technologies can thus help overcome the socio-economic and geographical barriers that often hinder access to quality education.

Another major contribution of AI is the automation of teachers' administrative and repetitive tasks. According to (Seo et al. ,2021), AI can handle activities such as grading assignments, tracking student progress, and providing individualized feedback. This automation frees up time for teachers, allowing them to focus on more complex aspects of teaching, such as designing tailored curricula and interacting with students.

Finally, AI offers valuable tools for predicting student behavior and optimizing educational processes. Through predictive analytics, as noted by (Vincent-Lancrin and van der Vlies ,2020), educational systems can identify students at risk of dropping out and implement early interventions. Moreover, AI helps prepare learners for future challenges by developing essential skills such as creativity and critical thinking, necessary in a constantly evolving world.

- **A Driver of Change**

Artificial Intelligence has established itself as a transformative force in various sectors of the global economy, providing significant advantages to actors in the financial sector, as well as those in agriculture, medicine, and defense. In finance, AI opens up new perspectives by improving asset protection and market prediction. Central banks are increasingly adopting AI to enhance their surveillance and regulatory operations. For example, the Central Bank of Brazil has developed a prototype robot using machine learning to classify consumer complaints against financial institutions. Similarly, the Bank of Canada uses machine learning tools to identify anomalies in regulatory submissions, improving the efficiency of its supervisory activities. Moreover, AI can help detect financial risks such as money laundering or anomalies in transactions. For instance, the Innovation Hub of the Bank for International Settlements (BIS) has used neural networks to identify patterns and anomalies in transactions, allowing the detection of money laundering. These initiatives illustrate AI's positive impact on financial risk management and transaction security (Jeff Kearns, 2023).

Beyond the financial sector, AI has also revolutionized agriculture, medicine, and defense. In agriculture, AI is used to improve food production by developing climate-resistant varieties, providing soil data, and guiding drones for precise spraying of fertilizers and pesticides. This technology helps increase food security and reduce hunger worldwide. For example, Thailand has launched programs to promote the use of technology in agriculture, including the launch of Earth observation satellites to collect data for smart farming. Thai government agencies, such as the Digital Economy Promotion Agency (DEPA) and the National Innovation Agency (NIA), also support agricultural technology startups and encourage the use of drones for field management.

In healthcare, AI enables more accurate healthcare, rapid diagnoses, the development of new treatments, and efficient management of medical records, promising to improve clinical outcomes and patients' quality of life. For instance, AI is used to improve the productivity of retinal clinics by allowing more patients to be screened for diabetes-related eye damage. A study conducted in Bangladesh showed an increase in the number of quality consultations when the AI tool was used.

Finally, in defense, AI enhances military capabilities in terms of surveillance, intelligence data analysis, and combat scenario simulation, improving operational efficiency and decision-making in military operations. For example, in Ukraine, AI is deployed in various ways,

from strategy development to the use of drones for monitoring enemy movements and conducting remote and autonomous strikes. Moreover, it plays a crucial role in information warfare, where it is used to influence narrative construction and public perception of the conflict (Robert Horn, 2023).

- **AI: A Catalyst for Productivity and Innovation**

AI represents a major technological advancement with the potential to radically transform the nature of work and economic production. Brynjolfsson and Unger (2023) envision a future where AI is widely adopted in work processes, massively increasing the productivity of tasks performed by workers. This productivity increase stems from the automation of routine and repetitive tasks, freeing up workers to focus on more creative and innovative activities. In this vision, AI does not replace workers but complements them by capturing and embodying the tacit knowledge accumulated over time. This symbiosis between humans and machines allows a greater number of workers to dedicate their time to solving new problems and innovating, thereby transforming the economy into a society of researchers and innovators.

Moreover, AI paves the way for radical advances in fields such as medicine, science, and creativity. AI-powered algorithms can accelerate the discovery of new drugs and reveal unprecedented insights into human biology. Additionally, AI could even contribute to its own development, creating a virtuous cycle of continuous improvement and innovation (Brynjolfsson and Unger, 2023).

(Acemoglu and Johnson ,2023) also offer an optimistic view of AI's impact on productivity and economic growth. According to them, the widespread adoption of AI could significantly boost productivity growth, leading to a substantial increase in global GDP. Estimates vary, but according to Goldman Sachs[2], AI adoption could increase productivity growth by 15 percentage points per year over a decade, with a 7% increase in global GDP.

- **AI in the Service of Democracy**

AI is not limited to traditional economic spheres but also extends to the political sphere, as highlighted by (Hélène Landemore ,2023). Over the past 40 years, numerous experiments have been conducted to include ordinary citizens in policy-making and law-making processes, going beyond mere voting. These initiatives have often been local and small-scale, including citizens' assemblies, juries, and other forms of direct participation. A 2020 report by the Organisation for Economic Co-operation and Development (OECD) identified nearly 600 cases where a random sample of citizens deeply engaged with political issues to formulate informed recommendations or even concrete proposals. Some of these initiatives have also sought to achieve mass participation, particularly through participatory constitutional processes in several countries, as well as multi-format consultation campaigns. However, despite these commendable efforts, many participatory processes have been hindered by technological limitations and a limited capacity to effectively process citizens' contributions.

However, recent technological advancements offer new opportunities to improve and extend these deliberative processes. The province of Taiwan, for example, adopted an

2. Goldman Sachs is a major American financial institution that has expanded its activities in France since 1987. It is present in Paris with more than 400 employees and offers a wide range of services to its institutional clients, corporations, financial institutions, funders, public sector entities, and private clients

innovative approach by introducing an online platform called pol.is. This platform allows citizens to express detailed opinions on various subjects and vote on others' opinions while using algorithms to map the landscape of opinions and identify consensus and divergences. More recently, companies such as Meta[3], have explored the possibilities of using AI to facilitate large-scale deliberative processes. The Meta Community Forums were launched in 2022 to allow randomly selected groups of users to discuss issues such as climate content regulation and cyberbullying in the metaverse[4] (Hélène Landemore ,2023).

1.2. The Harmful Implications of Artificial Intelligence on the Global Economy

- **The Labor Market**

Artificial Intelligence raises concerns about its potential effect on the labor market. While some envision increased employment opportunities and improved efficiency, others fear massive job losses and radical changes in the very nature of work.

According to a recent OECD study, 27% of jobs are in occupations at high risk of automation (OECD, 2023). This statistic, although alarming, resonates with other sources that suggest that up to a quarter of the work currently performed by humans could be accomplished by AI systems. Such a transition could potentially lead to the loss of 300 million jobs in the United States and the European Union (Goldman Sachs, 2023).

Moreover, technologists and managers have exploited AI to directly substitute many types of human labor, contributing to wage stagnation or even decline in many sectors. The advent of generative AI has introduced an additional dimension to this issue, with machines capable of producing textual, visual, and auditory content that was once considered the domain of human creativity. This evolution allows machines to interact with customers and create marketing content, threatening a broader range of jobs (Erik Brynjolfsson and Gabriel Unger, 2023).

A major concern accompanying this transition is the exacerbation of income inequalities between workers. A large body of empirical research in labor economics suggests that computers and other forms of information technology may have contributed to income inequality by automating middle-tier jobs, polarizing the workforce between high-income and low-income workers. While the CEO and the janitor remain, computers have replaced part of the middle segment of office workers (Autor, Levy, and Murnane, 2003).

- **Economic Inequalities**

AI does not merely disrupt the labor market; it also amplifies economic inequalities. As noted by (Berg, Papageorgiou, and Vaziri ,2023), the widespread adoption of AI often favors skilled workers at the expense of unskilled workers. Technological advances tend to increase the productivity of highly skilled workers, creating greater demand for their skills and exacerbating wage gaps.

3. Formerly known as Facebook

4. The metaverse is an emerging concept that represents a network of persistent and shared virtual environments, combining immersive 3D virtual worlds with elements of social networks, collaborative spaces, marketplaces, and e-commerce

At the same time, the rise of large tech companies in the AI field raises concerns about the concentration of economic power and potential regulatory policy manipulation. This concentration could not only limit market competition but also worsen inequalities by favoring the interests of large companies at the expense of workers and small businesses. To mitigate these risks, it is crucial for governments to implement appropriate regulations to ensure fair competition and equitable distribution of economic benefits.

- **Industrial Concentration**

Since the 1980s, a major phenomenon has emerged in developed economies, particularly in the United States: the rise of industrial concentration. This phenomenon, measuring the collective market share held by the largest companies in a given sector, has been largely fueled by the advent and widespread adoption of Artificial Intelligence. Large companies with considerable financial and technological resources have rapidly adopted AI to increase their productivity and profitability. This trend has created an environment where only the largest companies are able to fully exploit the benefits of AI, reinforcing their dominance in the market.

The growing use of AI in large companies is partly driven by the high costs associated with developing and operating AI models. The massive investments required to train these models, as well as the ongoing operating costs, have created a barrier to entry for smaller and less financially robust companies. Technology giants such as Alphabet, Microsoft, and OpenAI have already invested considerable sums in developing their own AI technologies, further strengthening their dominant market position. Even if AI costs were to decrease, the advantages in terms of resources and data already accumulated would still confer a disproportionate advantage to large companies.

As a result, the rise of AI has contributed to increased consolidation among large companies, making them increasingly dominant in the market. This development challenges the traditional advantages of small businesses, highlighting AI's crucial role in redefining the competitive landscape. While large companies leverage AI to improve their operational efficiency and internal coordination, small businesses face growing challenges in competing in an environment where technological innovation has become a key driver of economic success (Erik Brynjolfsson and Gabriel Unger, 2023).

- **Towards Inclusive Growth**

Automation, often perceived as a symbol of efficiency and progress, poses a paradoxical challenge to the traditional narrative of productivity. Although it undeniably elevates average productivity by streamlining operations, its impact on marginal productivity is often divergent. Technologies such as industrial robots and advanced algorithms can replace workers, thereby reducing their marginal contribution to production. In other words, each additional unit of labor added to an automated process may not bring as much value as before, as part of that value is now generated by the technology itself. Consequently, despite exponential productivity gains, the promise of shared prosperity remains elusive, highlighting the limitations of traditional approaches to fostering inclusive economic growth. For example, if a company replaces part of its workforce with automated machines, it can achieve cost savings and increase its productivity. However, this may also lead to job losses for workers, which can exacerbate economic and social inequalities.

However, there is a path forward that reconciles productivity improvement with equitable employment opportunities. Rather than relying solely on automation to increase efficiency,

alternative strategies prioritize enhancing individual contributions to production. By leveraging innovative software tools and fostering skill development, companies can increase workers' marginal productivity without resorting to massive labor replacement. For example, improved software tools for automotive mechanics can increase workers' marginal productivity without fully automating their work. This nuanced approach acknowledges the complexities of the machinery issue and offers a roadmap for navigating the evolving landscape of technological advancement towards sustainable and inclusive economic development (Daron Acemoglu and Simon Johnson, 2023).

- **AI Weapons**

In the complex context of technological emergence, the possibility of narrative manipulation by generic Artificial Intelligence (GenAI) raises serious concerns. As highlighted by (Hervé Tourpe ,2023), narratives shaped by AI can reinforce cognitive biases and information bubbles by adapting to individuals' preexisting beliefs, whether presented in text, image, or synthetic video form, creating an illusion of reality.

The persuasive power of GenAI also raises concerns about its propensity to spread misinformation on a large scale. Examples such as the synthetic video from March 2022, supposedly showing the Ukrainian president surrendering to Russian forces, illustrate how AI can be used to manipulate politics, markets, and public opinion, potentially leading to significant socio-economic disruptions (Hervé Tourpe, 2023).

However, it is important to recognize that misinformation propagated by GenAI can sometimes result from algorithmic errors or inaccuracies without malicious intent. Regardless of the intentions behind these AI-generated narratives, their consequences can be harmful and lasting, affecting political, economic, and social spheres on a global scale.

CHAPTER 2: THE GROWING ADOPTION OF ARTIFICIAL INTELLIGENCE IN AFRICA

The integration of Artificial Intelligence in Africa is a topic of increasing interest, offering both promising opportunities and formidable challenges. This chapter explores the various issues Africa faces in its journey towards significant AI adoption while highlighting the potential opportunities that can be leveraged to catalyze the continent's socio-economic development.

- **African Leaders in the Digital Transformation Race**

Artificial Intelligence is emerging as a major driver of global economic transformation, and African countries are fully aware of its potential. With a multitude of startups and emerging initiatives, the African continent is resolutely embarking on the path of adopting this revolutionary technology. In 2023, some countries stand out for their readiness to integrate AI into their socio-economic policies, benefiting from a favorable political environment, investments in infrastructure, and a growing concentration of specialized talent.

The ranking established by Oxford Insights reveals a clear hierarchy among African countries in terms of AI adoption readiness. The ranking, titled "Government AI Readiness Index 2023," covered 193 countries worldwide. It was based on 39 indicators across three major

pillars, namely "Government," "Technology Sector," "Data and Infrastructure," and "Private Sector." Mauritius, Egypt, and South Africa emerge at the top of the ranking, highlighting their commitment to developing ecosystems conducive to technological innovation. These countries have invested in progressive government policies, thus fostering the rise of AI-focused startups and companies.

However, disparities persist across the continent, as shown by the low ranking of some countries, such as Côte d'Ivoire. These gaps underscore the importance of a strategic and holistic approach to preparing African countries for AI adoption (Table 1).

Table 1

African Countries Best Prepared for AI Adoption in 2023

Country	African Rank	Global Rank	Country	African Rank	Global Rank
Mauritius	1st	61st	Botswana	11th	110th
Egypt	2nd	62nd	Seychelles	12th	112th
South Africa	3rd	77th	Cabo Verde	13th	119th
Tunisia	4th	81st	Algeria	14th	120th
Rwanda	5th	84th	Namibia	15th	125th
Morocco	6th	88th	Uganda	16th	132nd
Senegal	7th	91st	Gabon	17th	135th
Benin	8th	97th	Tanzania	18th	137th
Kenya	9th	101st	Côte d'Ivoire	19th	138th
Nigeria	10th	103rd	Ethiopia	20th	140th

Source: Oxford insights

- **The Dynamics of AI Adoption in Africa**

The growing adoption of Artificial Intelligence in Africa is an evolving phenomenon that requires a deep understanding of the social, economic, and technological dynamics at play. According to (Schoeman et al. ,2021), this adoption relies on the development of dynamic ecosystems involving five key stakeholders: policymakers, universities, large companies, startups, and multi-stakeholder partnerships. These actors play a crucial role in promoting innovation, skill development, and creating an environment conducive to the successful integration of AI in various sectors.

Concrete examples of AI usage in Africa highlight its transformative potential in areas such as healthcare, agriculture, and financial services. For example, in Ghana, Artificial Intelligence is used to optimize the accuracy and efficiency of medical diagnoses. A startup named "Mpharma" has developed an AI-powered platform that assists pharmacists and doctors in making the most accurate diagnoses of diseases and prescribing appropriate medications to patients. Similarly, data platforms like Zenvus in Nigeria facilitate access to crucial information for farmers, leading to improved yields and agricultural productivity (Francesc et al., 2019). In South Africa, another example of AI usage involves enhancing the

efficiency and accuracy of financial services. A startup named "ThisIsMe" has developed an AI-powered platform that allows financial institutions to verify their customers' identities more accurately and securely. Additionally, in Rwanda, AI is used to improve the quality of education. For example, the government has partnered with IBM to launch a program called "IBM Digital - Nation Africa," offering free online courses in AI, cloud computing, and data science to young Rwandans.

However, despite the progress made, many African countries still face persistent challenges such as a lack of infrastructure and technical skills.

- **Obstacles to AI Adoption**

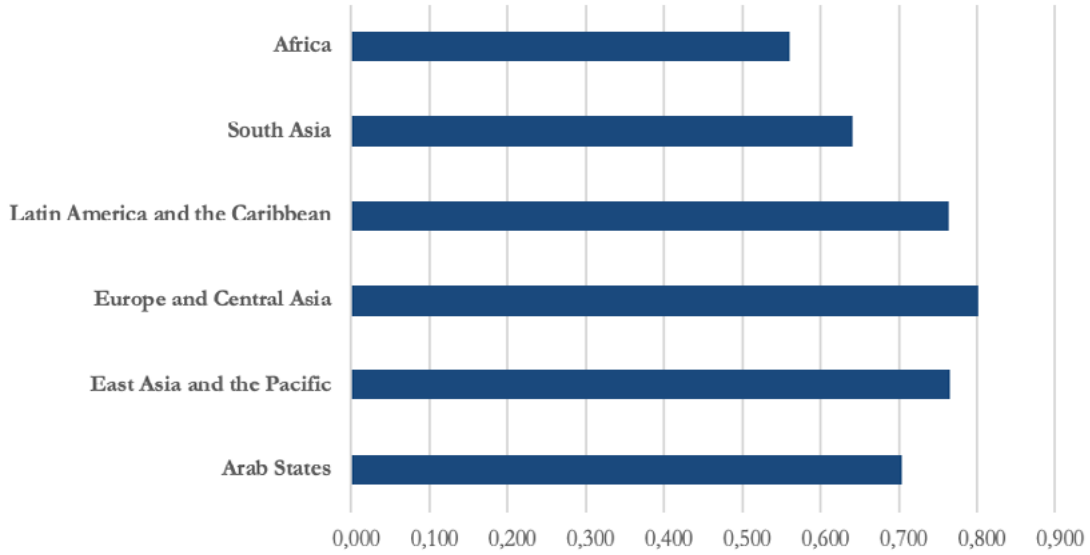
The integration of Artificial Intelligence in Africa faces a series of obstacles that hinder its development and effective use. These obstacles, stemming from various domains such as education, infrastructure, regulation, and structural inequalities, represent significant challenges to fully harnessing AI's potential on the continent.

1. The Challenges of Structural Inequalities and Digital Divides in Africa

Structural inequalities, such as limited access to socio-economic and political resources, significantly hinder the adoption of Artificial Intelligence. These disparities manifest in unequal access to essentials such as education, employment, income, information and communication technologies (ICT), and healthcare. In African countries, these inequalities are particularly pronounced, with some of the lowest levels of development in the world in these areas (Figure 1).

Figure 1

Human Development Index (2022)



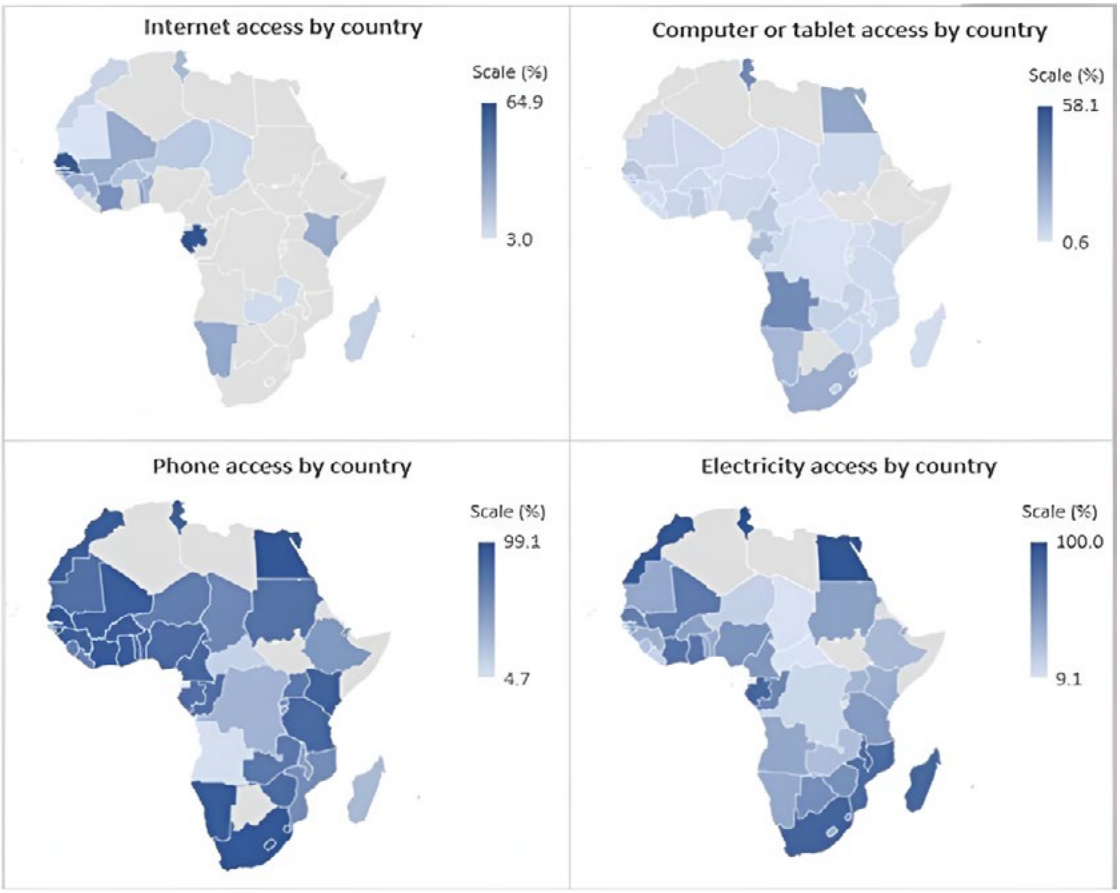
Source: United Nations Development Program and African Development Bank

At the same time, digital divides in Africa exacerbate these inequalities by limiting access to ICT. Problems such as the lack of telecommunications infrastructure, the absence of

electricity in some regions, the high cost of smartphones, and the lack of digital skills contribute to widening the gap between those who have access to ICT and those who do not. This situation exacerbates existing imbalances and prevents many individuals from benefiting from the opportunities offered by AI (Figure 2).

Figure 2

Digital Connectivity in Africa[5]



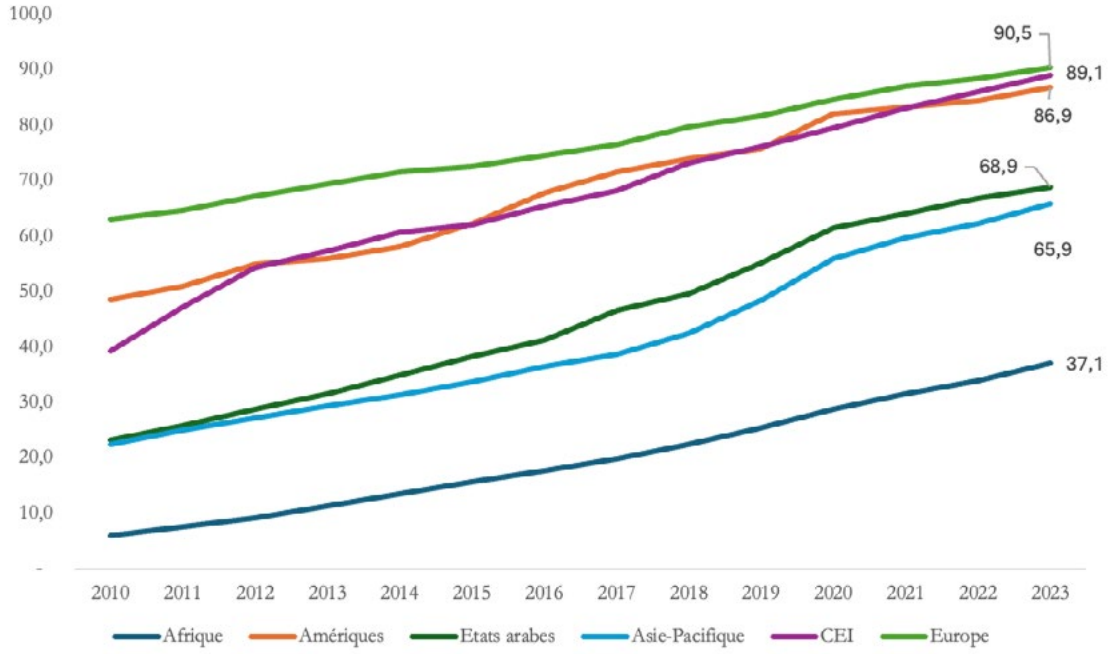
Source: World Bank 2023

The adoption of AI is also hampered by insufficient network accessibility in Africa. The growth of infrastructure development and mobile technology connectivity is slow, with a significant percentage of the African population unconnected and without Internet access (**Marino Garcia and Kelly, 2015**). Additionally, the high costs of Internet access and broadband hinder the widespread adoption of AI, with expenses reaching up to 44% of GDP in some African countries (**Marino Garcia and Kelly, 2020**).

5. Note: The countries in gray do not have data on the measure concerned. Only the countries in blue represent those with available data.

Figure 3

Individuals Using the Internet by Region (%)[6]



Source: International Telecommunication Union

Consequently, structural inequalities and digital divides compromise African countries' readiness to fully benefit from AI's potential advantages. Not only does this affect employment, education, and healthcare opportunities for many people, but it also limits governments' ability to effectively leverage these technologies for the general well-being of the population (**Arakpogun et al., 2021**).

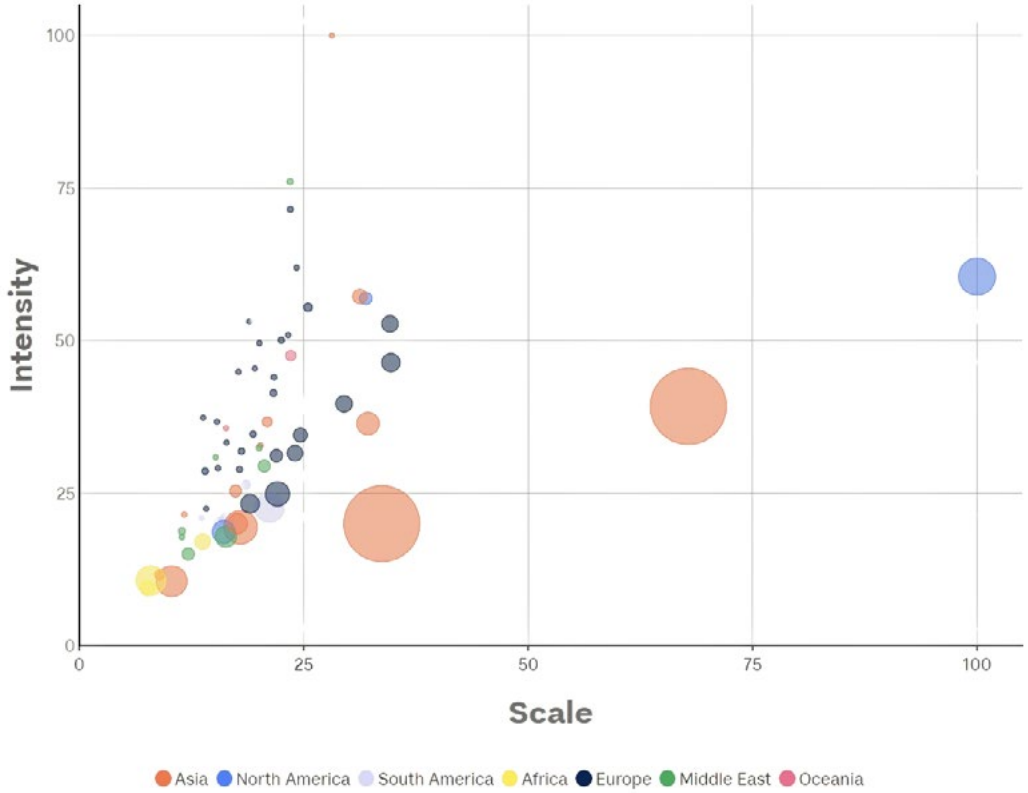
2. The Challenge of Catching Up

Africa lags behind other regions of the world in AI adoption and readiness. AI startups in Africa emerged nearly a decade after the beginning of the Fourth Industrial Revolution in 2000, and no African nation ranks among the top 50 countries in terms of government readiness for AI (**Arakpogun et al., 2021**). This lag highlights the challenges Africa faces in catching up and fully adopting AI technologies (Figure 4).

6. See appendix (Table 2)

Figure 4

Comparative Analysis of AI Capacity[7]



Source : Tortoise

3. Low Investment in Research and Development

Artificial Intelligence has become an essential field of Research and Development (R&D) worldwide. Progress in this area has led to numerous technological, economic, and social advancements. However, in Africa, insufficient investment in R&D (Figure 5) has limited AI innovation growth on the continent.

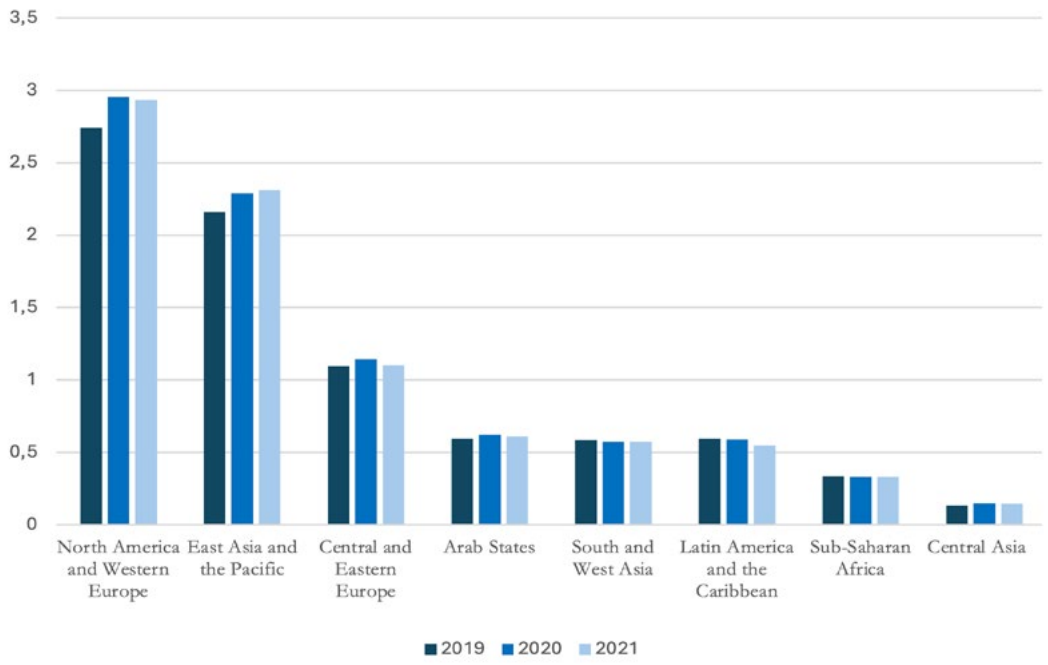
Underinvestment in R&D in Africa is a major obstacle to the continent's ability to generate innovations relevant to its specific AI needs. Financial resources, both public and private, are limited, hindering cutting-edge research and the development of innovative applications. This situation risks keeping Africa on the sidelines of the global AI economy, compromising its long-term economic growth. Additionally, the lack of skills and training in AI is a major obstacle to innovation growth on the continent. African universities lack the resources to offer quality AI training programs, limiting students' opportunities to acquire the necessary skills (**CARI, 2021; University World News, 2023**).

7. The Global AI Index assesses the artificial intelligence capacity of nations through two measures: absolute and relative. The final score is a combination of these two approaches, broken down into two key concepts: scale, which measures the raw power of a country's AI ecosystem on the global stage, and intensity, which evaluates the efficiency of AI resource utilization relative to the size of the country's population or economy. This combination provides a holistic assessment of a country's AI capacity, considering both the quantity of AI activity and its relative effectiveness

Finally, the lack of AI Research and Development infrastructure in Africa limits the possibilities for collaboration and knowledge exchange between local and international researchers. Specialized AI research centers are rare, as are adequate telecommunications and energy infrastructures. This situation hinders the implementation of large-scale AI projects, thereby limiting the potential impact of this technology on the continent.

Figure 5

R&D Investment Expenditures (as a Percentage of GDP by Region)



Source : UNESCO Institute for Statistics

CONCLUSION

The integration of Artificial Intelligence in Africa presents considerable opportunities but also substantial challenges. While some African countries stand out for their commitment and progress in preparing for AI adoption, others face significant obstacles such as structural inequalities and digital divides. This disparity highlights the need for an inclusive and holistic approach to ensure that all African countries can benefit from AI while closing the gap with other regions of the world.

To overcome these challenges and fully exploit AI's potential in Africa, a concerted effort is essential. This involves increased investment in digital infrastructure, specialized training, and Research and Development. Moreover, visionary government policies and strategic partnerships between the public sector, private sector, and civil society are necessary to create an environment conducive to innovation and AI-driven economic growth. By working together, African nations can transform current challenges into opportunities and pave the way for a future where AI contributes significantly to sustainable development and improved quality of life for all Africans.

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APPENDIX

Table 2

Afrique	Amériques	États arabes	Asie-Pacifique	CEI	Europe
Angola	Antigua and Barbuda	Algeria	Afghanistan	Armenia	Albania
Benin	Argentina	Bahrain	Australia	Azerbaijan	Andorra
Botswana	Bahamas	Comoros	Bangladesh	Belarus	Austria
Burkina Faso	Barbados	Djibouti	Bhutan	Kazakhstan	Belgium
Burundi	Belize	Egypt	Brunei Darussalam	Kyrgyzstan	Bosnia and Herzegovina
Cameroon	Bolivia	Iraq	Cambodia	Russian Federation	Bulgaria
Cabo Verde	Brazil	Jordan	China	Tajikistan	Croatia
Central African Rep.	Canada	Kuwait	Dem. People's Rep. of Korea	Turkmenistan	Cyprus
Chad	Chile	Lebanon	Fiji	Uzbekistan	Czech Republic
Congo (Rep. of the)	Colombia	Libya	Hong Kong, China		Denmark
Côte d'Ivoire	Costa Rica	Mauritania	India		Estonia
Dem. Rep. of the Congo)	Cuba	Morocco	Indonesia		Finland
Equatorial Guinea	Dominica	Oman	Iran (Islamic Republic of)		France
Eritrea	Dominican Rep.	Palestine	Japan		Georgia
Eswatini	Ecuador	Qatar	Kiribati		Germany
Ethiopia	El Salvador	Saudi Arabia	Korea (Rep. of)		Greece
Gabon	Grenada	Somalia	Lao P.D.R		Hungary
Gambia	Guatemala	Sudan	Macao, China		Iceland
Ghana	Guyana	Syrian Arab Republic	Malaysia		Ireland
Guinea	Haiti	Tunisia	Maldives		Israel
Guinea-Bissau	Honduras	United Arab Emirates	Marshall Islands		Italy
Kenya	Jamaica	Yemen	Micronesia		Latvia
Lesotho	Mexico		Mongolia		Liechtenstein
Liberia	Nicaragua		Myanmar		Lithuania
Madagascar	Panama		Nauru		Luxembourg
Malawi	Paraguay		Nepal (Republic of)		Malta
Mali	Peru		New Zealand		Moldova
Mauritius	Saint Kitts and Nevis		Pakistan		Monaco
Mozambique	Saint Lucia		Papua New Guinea		Montenegro
Namibia	Saint Vincent and the Grenadines		Philippines		Netherlands
Niger	Suriname		Samoa		Norway
Nigeria	Trinidad and Tobago		Singapore		Poland
Rwanda	United States		Solomon Islands		Portugal
Sao Tome and Principe	Uruguay		Sri Lanka		Romania
Senegal	Venezuela		Thailand		San Marino
Seychelles			Timor-Leste		Serbia
Sierra Leone			Tonga		Slovakia
South Africa			Tuvalu		Slovenia
South Sudan			Vanuatu		Spain
Tanzania			Viet Nam		Sweden
Togo					Switzerland
Uganda					Rep.of North Macedonia
Zambia					Türkiye
Zimbabwe					Ukraine
					United Kingdom
					Vatican

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Fahd Azaroual is an Economist at the Policy Center for the New South. His research areas cover macroeconomics. He is currently working on themes related to Economic growth and business cycles. Fahd holds a master's degree in applied economics and is currently a PhD student at Mohammed V University in Rabat. he joined the Policy Center for the New South in October 2019.

About the Policy Center for the New South

The Policy Center for the New South (PCNS) is a Moroccan think tank aiming to contribute to the improvement of economic and social public policies that challenge Morocco and the rest of Africa as integral parts of the global South.

The PCNS pleads for an open, accountable and enterprising "new South" that defines its own narratives and mental maps around the Mediterranean and South Atlantic basins, as part of a forward-looking relationship with the rest of the world. Through its analytical endeavours, the think tank aims to support the development of public policies in Africa and to give the floor to experts from the South. This stance is focused on dialogue and partnership, and aims to cultivate African expertise and excellence needed for the accurate analysis of African and global challenges and the suggestion of appropriate solutions.

Read more

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