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Digital Transformation: Aligning Italy's Piano Mattei with African Development Priorities

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ABSTRACT

Africa's digital landscape is undergoing rapid transformation driven by a surge in entrepreneurial activity and widespread adoption of digital technologies. The Digital Flagship – a strategic partnership between the Italian government, UNDP and four African countries – builds on this progress by leveraging Africa's digital transformation to build climate-neutral, cyber-resilient digital infrastructure, strengthen digital public platforms and accelerate technology adoption to improve the accessibility and delivery of public services. However, the success of Africa's digital transformation depends on overcoming key structural barriers including Africa's widening digital infrastructure gaps, digital skills shortages, underdeveloped financing mechanisms and fragmentation caused by overlapping and uncoordinated digital initiatives. These structural bottlenecks risk undermining coherent regulatory frameworks and the long-term viability of Africa's digital sector. Bridging these gaps is crucial to strengthening Italy-Europe-Africa digital partnership.

keywords

Africa | Digital policy | Italian foreign policy

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Introduction

The world's digital landscape is marked by profound disparities – both within and across societies shaped by geography, gender, income, race, ethnicity, education and age. While global connectivity has expanded from one billion people with access to the internet in 2002 to over 5.3 billion in 2024, the digital divide remains stark.[1] In Europe, 89 per cent of the population is online, compared to just 44 per cent in sub-Saharan Africa.[2] In many low-income countries, limited connectivity and unreliable energy supply, inadequate data centres and poor infrastructure have led to over 1 trillion dollars in economic losses.[3] Affordability remains a critical barrier to universal internet access. For example, in sub-Saharan Africa, where internet penetration is the lowest globally, the cost of a smartphone exceeds 40 per cent of the average monthly income and data prices remain nearly three times the global average. Recognising the transformative potential of digitalisation, African countries and regional economic communities (RECs) have established or are in the process of establishing national and sub-regional digital policy

[1] United Nations, "A Global Digital Compact - an Open, Free and Secure Digital Future for All", in *Our Common Agenda Policy Briefs*, No. 5 (May 2023), p. 2, https://doi.org/10.18356/27082245-28.

[2] GSMA, *The Mobile Economy Sub-Saharan Africa 2024*, November 2024, p. 11, https://www.gsma.com/solutions-and-impact/connectivity-for-good/mobile-economy/wp-content/uploads/2024/11/GSMA_ME_SSA_2024_Web.pdf; Eurostat, *Access to Internet in Urban and Rural Areas in 2023*, 22 November 2024, https://ec.europa.eu/eurostat/web/products-eurostat-news/w/ddn-20241122-1.

[3] World Bank, *Well Maintained: Economic Benefits from More Reliable and Resilient Infrastructure*, May 2021, p. 27, https://ppp.worldbank.org/node/5580.

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frameworks to inform Africa's digital transformation. For instance, both the Digital Transformation Strategy for Africa (2020-2030)[4] of the African Union (AU) and the AU's Continental AI Strategy[5] underscore the continent's demographic dividend as a growth frontier. Both policy documents aim to harness the transformative power of digital technologies to stimulate innovation and job creation, address skills shortage, reduce inequalities, improve public service delivery and promote economic integration. With an estimated three-hundred million Africans expected to come online by 2025,[6] urgent, coordinated action from governments, development partners, academia, civil society and the private sector is needed to ensure that Africa's digital transformation is both inclusive and equitable, and that it compliments national, sub-regional and continental efforts to drive sustainable socio-economic development.

This paper examines key trends, emerging opportunities and structural challenges shaping digital transformation and digital infrastructure ecosystems in Côte d'Ivoire, Ghana, Mozambique and Senegal – the four African partner countries participating in Italy's Digital Flagship initiative. It explores how the Digital Flagship initiative can be leveraged to build climate-neutral and cyber-resilient digital ecosystems, advance Africa's digital public infrastructure and accelerate technological adoption to improve access to and delivery of public goods and services. The concluding section offers policy recommendations and identifies action areas to further strengthen Italy-Europe-Africa digital partnership.

1. The spirit driving Africa's technological revolution

From the bustling streets of Nairobi to the vibrant tech hubs of Lagos and Kigali, and the towering skylines of Cape Town and Johannesburg, African innovators and techprenuers are harnessing the power of AI and digital technologies to drive innovation and develop transformative solutions to pressing challenges. Digital fintech start-ups in Rwanda and Nigeria, mobile money innovations in Kenya, Lesotho and Zimbabwe, and pay-as-you-go solar innovations in Kenya and Ghana attest to ingenuity of Africa's techprenuers and its dynamic digital and technology landscape.[7] An example is CF Grower, a tech start up in Ghana which uses AI technology to help reduce barriers to entry for new and aspiring farmers.[8] The platform enables new and aspiring farmers to hire highly experienced farm managers to oversee day-to-day farm operations. AgroCenta – a platform that

[4] African Union, *The Digital Transformation Strategy for Africa (2020-2030)*, 18 May 2020, https://au.int/en/node/38507.

[5] African Union, *Continental AI Strategy. Harnessing AI for Africa's Development and Prosperity*, July 2024, https://au.int/en/node/44004.

[6] African Union, *The Digital Transformation Strategy for Africa*, cit., p. 3.

[7] Mike Bruton, *Harambee. The Spirit of Innovation in Africa*, Cape Town, HSRC Press, 2022.

[8] CF Grower website: *Farm with Confidence as a First-Time Farmer*, https://www.completefarmer.com/products/grower/new-farmer.

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enables rural based smallholder farmers in Ghana to directly access markets and finance by bypassing middlemen, is another.[9] A further example is Danaya in Côte d'Ivoire – an information security management systems firm that enables clients to verify the identity of individuals and businesses by examining authenticity of documents. The firm specialises in mitigating financial losses and managing risks related to fraud and identity theft which are estimated to cost businesses and individuals millions of dollars annually.[10] These innovations demonstrate Africa's commitment to leverage digital technologies to drive socioeconomic development and build a digitally inclusive future for all. Currently, there are more than 440 technology hubs in 93 cities across 42 African countries.[11] The AI Hub for Sustainable Development Start-Up Accelerator Pilot[12] – an initiative between the Italian government and the United Nations Development Programme (UNDP) – aims to support Africa's entrepreneurs to harness the potential of AI to drive human progress and accelerate achievement of Sustainable Development Goals (SDGs).[13] Between 2018 and 2020, more than 130 new technology hubs opened in Africa representing a four-fold yearly increase in total funding received for start-ups.[14]

In 2023, African start-ups secured over 3.5 billion dollars in total funding (both equity and debt), with the number of funding deals almost doubling. Total transactions and funding breached the twenty-billion-dollar mark in just ten years - 68 per cent of it in the last three years alone.[15] Across the continent, many African governments continue to demonstrate strong ambition to leverage digital technologies for sustainable development. This is reflected in continental policy documents and attempts at country and sub-regional levels to develop digital policy frameworks. For instance, the four pilot countries under Italy's Digital Flagship project[16] – Côte d'Ivoire, Ghana, Mozambique and Senegal – have each established national digital strategies and policies to inform implementation and guide roll-out of digital infrastructure ecosystems. However, despite these efforts, several constraints including infrastructure and financing gaps hinder sustainable investment in the digital sector, limiting the sector's long-term impact and scalability.

[9] AgroCenta website: https://agrocenta.com.

[10] Danaya website: https://docs.danaya.africa/documentation.

[11] Maxine Bayen, "Africa: A Look at the 442 Active Tech Hubs of the Continent", in *GSMA Blog*, 10 April 2024, https://www.gsma.com/solutions-and-impact/connectivity-for-good/mobile-for-development/blog/africa-a-look-at-the-442-active-tech-hubs-of-the-continent.

[12] AI Hub for Sustainable Development website: *About*, https://www.aihubfordevelopment.org/about; UNDP website: *AI Hub for Sustainable Development Co-Design*, https://www.undp.org/node/479016.

[13] UNDP, *Launch of Italy's Digital Flagship with Africa Initiative Aims to Close Africa's Sustainable Financing Gap*, 15 November 2024, https://www.undp.org/node/493966.

[14] African Union, *The Digital Transformation Strategy for Africa*, cit.

[15] Partech, *Presenting the 2023 Partech Africa Report: A Rough Year for the Ecosystem*, 23 January 2024, https://partechpartners.com/news/presenting-the-2023-partech-africa-report-a-rough-year-for-the-ecosystem.

[16] UNDP, *Launch of Italy's Digital Flagship with Africa*, cit.

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2. Africa's digital infrastructure for inclusive growth and service delivery

As African countries work towards a digitally secure and inclusive future, the need for robust regulatory and institutional mechanisms and policy frameworks to address cybersecurity threats, safeguard data protection and privacy, ensure affordable connectivity and foster strategic partnerships has never been greater. From pioneering digital and AI innovations in healthcare to breakthrough treatments for deadly diseases and innovative solutions for tackling climate change or improving educational outcomes for millions of people on the continent, Africa's digital future holds great promise. The World Bank estimates that digital technologies and AI have the potential to contribute up to 15.7 trillion dollars to the global economy, with Africa expected to generate approximately 1.2 trillion dollars – equivalent to a 5.6 per cent increase in the continent's GDP.[17]

In countries with fragile and weak governance systems, digitalisation of public services and goods can enhance stability and security by improving transparency and accountability, enhancing responsiveness and accessibility in the delivery of public goods and services. This is particularly true in contexts where causal linkages can be drawn between deficiencies and chronic incapacity in service provision and conflict, instability and insecurity or where the social contract is weak.[18] Research shows that absence of life-enhancing opportunities (such as access to health, education, employment) and sustainable livelihoods remain significant drivers of fragility and growing insecurity in Africa.[19] Poor service delivery (a manifestation of weak state presence) exacerbates horizontal inequalities which, when paired with perceptions of marginalisation, reinforce concerns about state neglect that erode trust in public institutions. For instance, lack of justice, pervasive impunity and perceived bias within judicial systems – often exacerbated by corruption and nepotism can serve as drivers of instability and insecurity.[20] One of the primary functions of a state is its ability to deliver public goods and services. It is one of the fundamental ways by which citizens and ordinary people interact with the state – and these interactions shape overall perceptions of the state and the legitimacy of its institutions. In countries with weak governance systems, skewed coverage and uneven distribution of public services can undermine long-term stability by elevating risks of instability and insecurity.

[17] Oyebola Okunogbe and Fabrizio Santoro, "Increasing Tax Collection in African Countries: The Role of Information Technology", in *Journal of African Economies*, Vol. 32, Supplement 1 (March 2023), p. 57-83, https://doi.org/10.1093/jae/ejac036.

[18] UNDP, "Journey to Extremism in Africa: Pathways to Recruitment and Disengagement", in *UNDP Reports*, February 2023, https://www.undp.org/node/385896.

[19] UNDP, "Journey to Extremism in Africa: Drivers, Incentives and the Tipping Point for Recruitment", in *UNDP Reports*, September 2017, https://www.undp.org/node/5966.

[20] UN Secretary-General, *Promotion of Durable Peace and Sustainable Development in Africa* (A/78/234-S/2023/553), 26 July 2023, https://www.un.org/osaa/node/1329.

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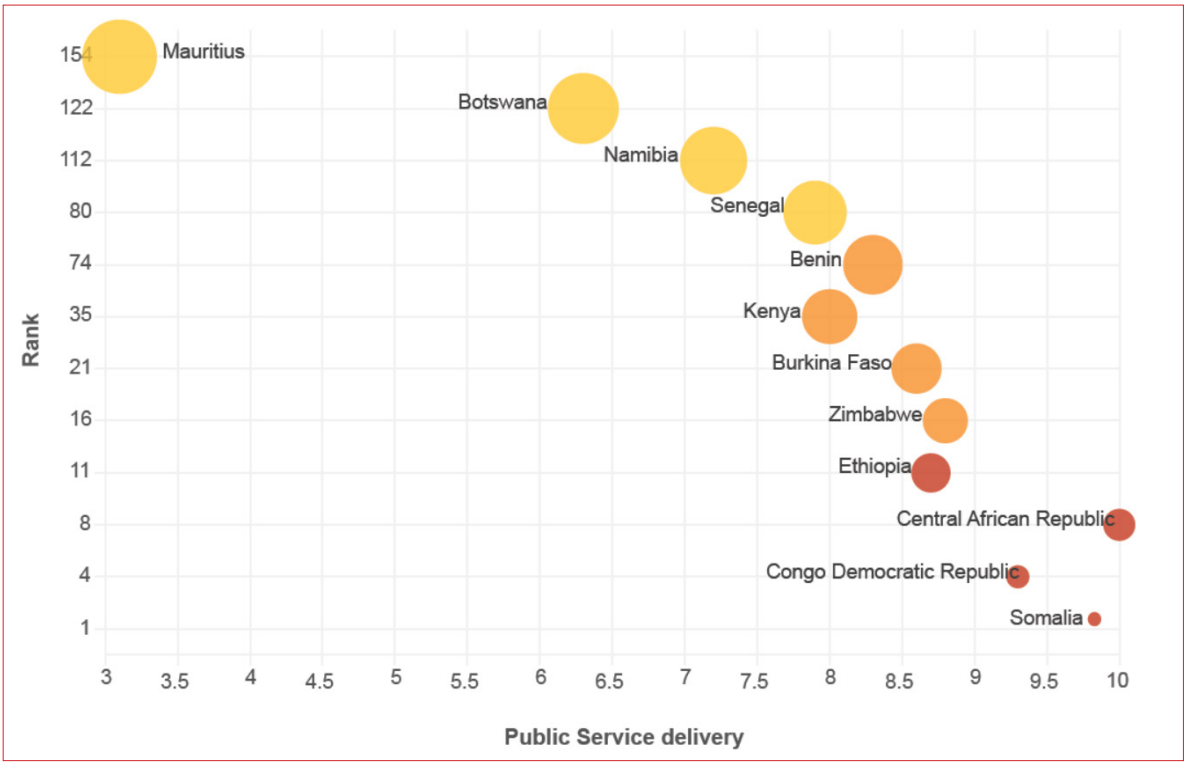
Figure 1 | Public service delivery in African countries with varying levels of fragility



Source: UN Office of the Special Advisor on Africa, *Home-Grown School Feeding: From Hot Meal to Macroeconomic Tool - A Low-Hanging Fruit for Africa's Urgent Challenges*, New York, United Nations, September 2024, p. 8, https://www.un.org/osaa/content/home-grown-school-feeding-hot-meal-macroeconomic-tool-for-africas-challenges.

Dissatisfaction and discontent with poor service delivery is linked to a rise in violent protests and riots (see Figure 1). Countries with weak and fragile governance systems face significantly heightened risks of insecurity and instability. Digital technology solutions and AI powered innovations that bridge digital divides and improve delivery of public goods and services can help build stable and more secure communities.

In Ghana, recent technological advancements have substantially lowered the cost of integrating identity data across government functions. The introduction of the national identification system, the "Ghana Card" in 2021 marked a shift in public sector efficiency. As a result, the number of registered tax filers rose from fewer than four million to nearly 6.6 million. Importantly, the Ghana Revenue Authority reported that it could now identify and trace approximately 85 per cent of the population, compared to just 4 per cent under the previous system – significantly enhancing the country's capacity for tax compliance and domestic resource mobilisation.

Similarly, the adoption of digital technologies has significantly enhanced the capacity of tax authorities to identify and rectify inconsistencies in taxpayer

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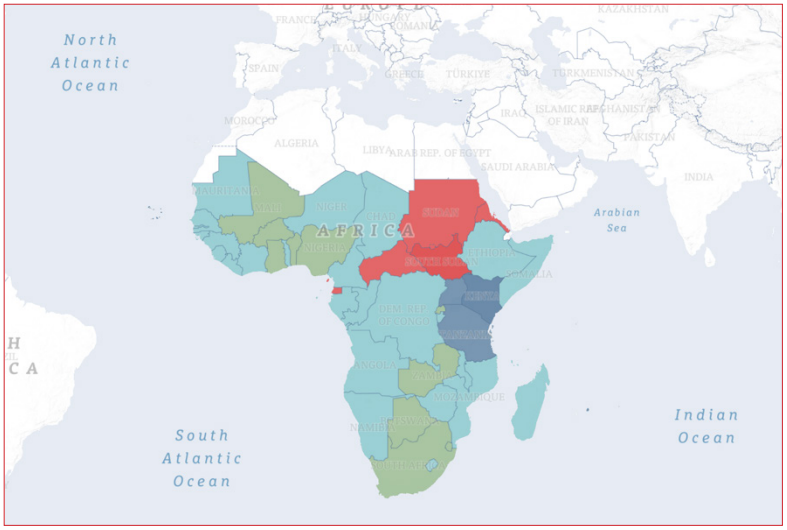
data in Kenya. This has contributed to stronger domestic resource mobilisation efforts. Improving tax compliance can positively impact the tax-to-GDP ratio. Between 2016 and 2017, the Kenyan Revenue Authority increased VAT collection by more than one billion dollars – thanks to M-PESA.[21] Digitalisation of public sector services affords users the flexibility to conduct transactions on the go and settle trade payments with ease. For those with internet connectivity and access, digitalised and automated systems are more efficient and are easier to track and monitor.

Figure 2 | GovTech Maturity Index (GTMI)[22] in 2022



Glossary

GTMI score no of countries
Blue (A) - 4
Green (B) - 10
Light blue (C) - 19
Red (D) - 15
Total 48

Source: World Bank, *GovTech Maturity Index (GTMI) Data Dashboard*, 15 November 2022, https://www.worldbank.org/en/data/interactive/2022/10/21/govtech-maturity-index-gtmi-data-dashboard.

3. Ghana's e-justice project

Ghana's e-justice project is underpinned by the country's Digital Transformation Agenda (2018).[23] It is integral to global governance efforts and for sustainable development and Ghana's own efforts to achieve SDG 16: peace, justice and strong institutions. With a history dating back decades, Ghana's e-justice project is

[21] M-PESA is Africa's largest mobile money platform that does not require a traditional bank account and is credited with facilitating financial inclusion among previously unbanked populations in Kenya.

[22] GTMI measures key aspects of 4 GovTech focus areas – supporting core government systems, enhancing service delivery, mainstreaming citizen engagement, and fostering GovTech enablers. Countries with lower scores (A=highest, D=lowest) have lower adoption for digitalisation for public service delivery.

[23] According to the UNDP's *E-Government Development Index*, Ghana advanced 15 places globally, rising from 123rd position in 2014 to 108th in 2024 – a reflection of the country's sustained investment in digital governance and public sector innovation.

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intended to ensure that justice delivery is effective, transparent and efficient by replacing old manual systems characterised by inefficiency, delays and allegations of corruption.[24] According to an Afrobarometer survey, the judiciary in Ghana is viewed in largely negative terms. Public trust is dented with a 32 per cent distrust and 30 per cent minimal trust.[25] Allegations of corruption, missing documents, delays in court proceedings and duplication continues to dent public trust in judiciary processes. Established in 2017 by the Ministry of Trade and Industry with technical assistance from the ACP-Friendly Programme, Ghana's Business Regulatory Reform (BRR) Unit leverages digital platforms to enhance citizen engagement and participation in public policy processes.[26] A key component of this project is the roll-out of Ghana's "virtual court rooms" (e-justice project) to facilitate speedy resolution of legal disputes. Ghana's e-justice project is expected to expedite justice delivery by eliminating the need for in-person court appearances, thereby reducing costs and time associated with traditional court hearings, particularly for people residing in remote areas and low-income households where physical court appearances can lead to additional financial burdens.

Globally, an estimated four billion people live outside the protection of the rule of law because of their marginal positions in society. In Africa, this was most visible during the Covid-19 pandemic when "lockdowns" created additional bureaucratic layers by restricting non-essential physical mobility and by extension access to justice and the efficient resolution of legal matters. A survey conducted by Afrobarometer across 36 African countries found that 54 per cent of citizens reported difficulties in accessing justice.[27] For example, the Kenyan court system had backlogs of up to one million cases in 2012 while Zimbabwe's High Court processes less than half of all cases brought before it per year.[28] Ghana's e-justice project that integrates modern technology illustrates how digital innovation can enhance inclusive governance and accelerate the delivery of justice. By improving user experience, increasing transparency and strengthening responsiveness, accountability and accessibility, Ghana's e-justice project has reduced case backlogs and alleviated pressure on judicial systems.

[24] Maame Efua Addadzi-Koom, *Positioning E-Justice in Ghana's E-Governance Agenda for Sustainable Development: Post-Pandemic Reflections*, paper presented at the 5th African Governance Seminar Series, Addis Ababa, 2022, https://www.researchgate.net/publication/375921843.

[25] Afrobarometer and Ghana Center for Democratic Development, *Summary of Results for the Afrobarometer Round 9 Survey in Ghana in 2022*, 24 October 2022, p. 50, https://www.afrobarometer.org/?p=17727.

[26] Jean Arlet and Madelynne Grace Wager, "Transforming Governance in Ghana: A New Regulatory Service Model for Africa", in *Africa Can End Poverty Blog*, 26 March 2024, https://blogs.worldbank.org/en/africacan/transforming-governance-in-ghana-a-new-regulatory-service-model.

[27] Carolyn Logan, "Ambitious SDG Goal Confronts Challenging Realities: Access to Justice Is Still Elusive for Many Africans", in *Afrobarometer Policy Papers*, No. 39 (March 2017), p. 3, https://www.afrobarometer.org/?p=6528.

[28] Logan Finucan, Erika Barros Sierra and Namita Rajesh, *Smart Courts: Roadmap for Digital Transformation of Justice in Africa*, London, Access Partnership, March 2019, https://accesspartnership.com/?p=2113.

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4. Unlocking Africa's agricultural potential: Harnessing AI for a climate-resilient future

African techprenuers and innovators are leveraging AI and digital technological solutions to build climate resilience, revolutionise and transform agriculture. According to a report published by the African Development Bank, Africa holds 65 per cent of the world's uncultivated arable land. The agriculture sector contributes approximately 30 per cent of the continent's GDP and employs more than 50 per cent of its current workforce.[29] Despite its vast potential, Africa's agricultural sector grapples with significant challenges, including water scarcity, food insecurity, environmental degradation and unpredictable weather patterns.

In response, African agritech entrepreneurs are harnessing AI-driven solutions to enhance resource efficiency, optimise yields and build resilience against climate-related shocks, driving a more sustainable and technology-enabled agricultural transformation. In Ghana, Senegal, Côte d'Ivoire and Mozambique, AI-powered precision agriculture is transforming resource management by optimising the use of scarce inputs such as water while enhancing crop quality and yields. In Ghana, where technological infrastructure is relatively advanced, cutting-edge tools, including satellite imagery, high-resolution drone sensors and geographic information systems enable real-time monitoring of crop and soil health, and nutrient levels. These innovations are empowering smallholder farmers to carry out their activities more efficiently and effectively – from applying fertilizers, water and pesticides to significantly lowering production costs and minimising post-harvest losses (PHLs) and reducing environmental impact. A notable example is TechShelta, a tech start-up in Ghana that provides specialised greenhouse services to smallholder farmers.[30] The company integrates technology with agriculture, allowing for automation for efficient remote operational monitoring and control. Another is Senegal's e-Tolbi, an AI-powered tool that provides farmers with yield forecasting information and field management platform to monitor plant health, fertilisation and water requirements.[31]

Conservative projections estimate that the use of AI in agriculture will grow at an annual growth rate of 23 per cent between 2023 and 2028, rising from 1.7 billion to 4.7 billion dollars in investments.[32] In sub-Saharan Africa, the agri-food tech sector has experienced remarkable expansion, with private investments surging from under 10 million dollars in 2014 to nearly 600 million dollars by 2022.[33] The highest adoption of AI is in fintech followed by crop monitoring (see Figure 3).

[29] African Development Bank, *Feed Africa*, May 2019, https://www.afdb.org/en/node/28532.

[30] Ghana Techshelta: https://ghanacic.ashesi.edu.gh/ventures/techshelta-limited.

[31] Tolbi website: https://tolbi.ai/fr.

[32] Chakib Jenane, "Is Artificial Intelligence the Future of Farming? Exploring Opportunities and Challenges in Sub-Saharan Africa", in *Agriculture & Food Blog*, 12 March 2025, https://blogs.worldbank.org/en/agfood/artificial-interlligence-in-the-future-of-sub-saharan-africa-far.

[33] Ibid.

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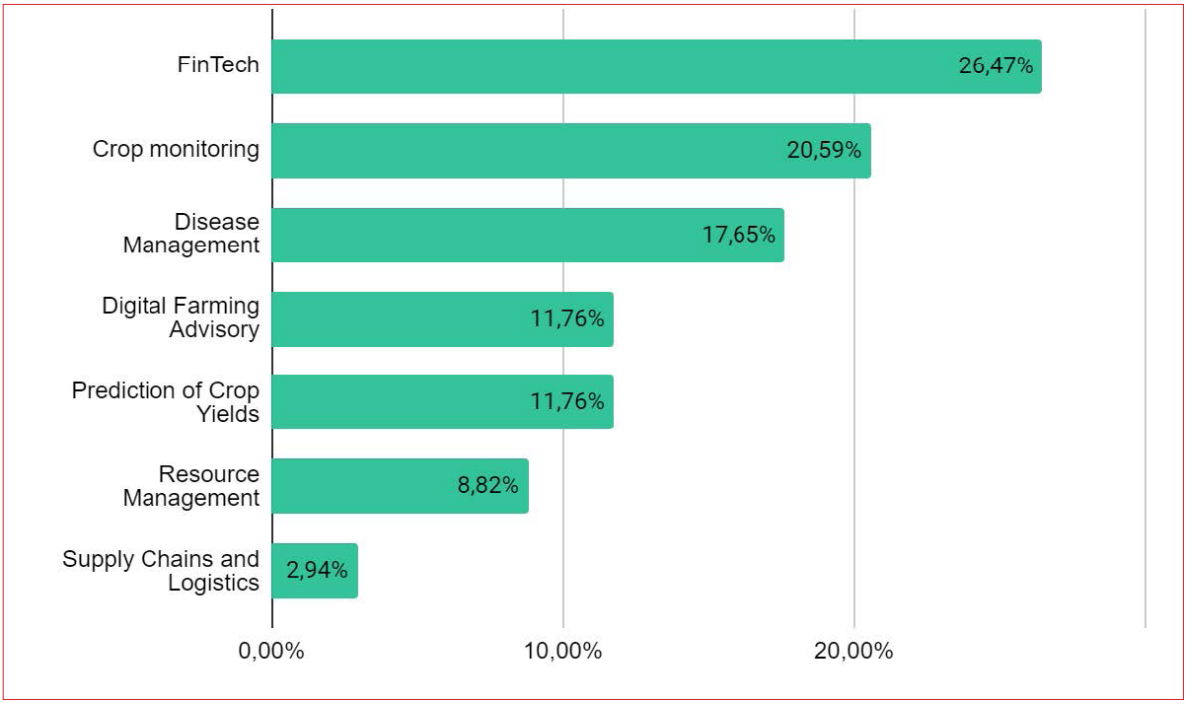
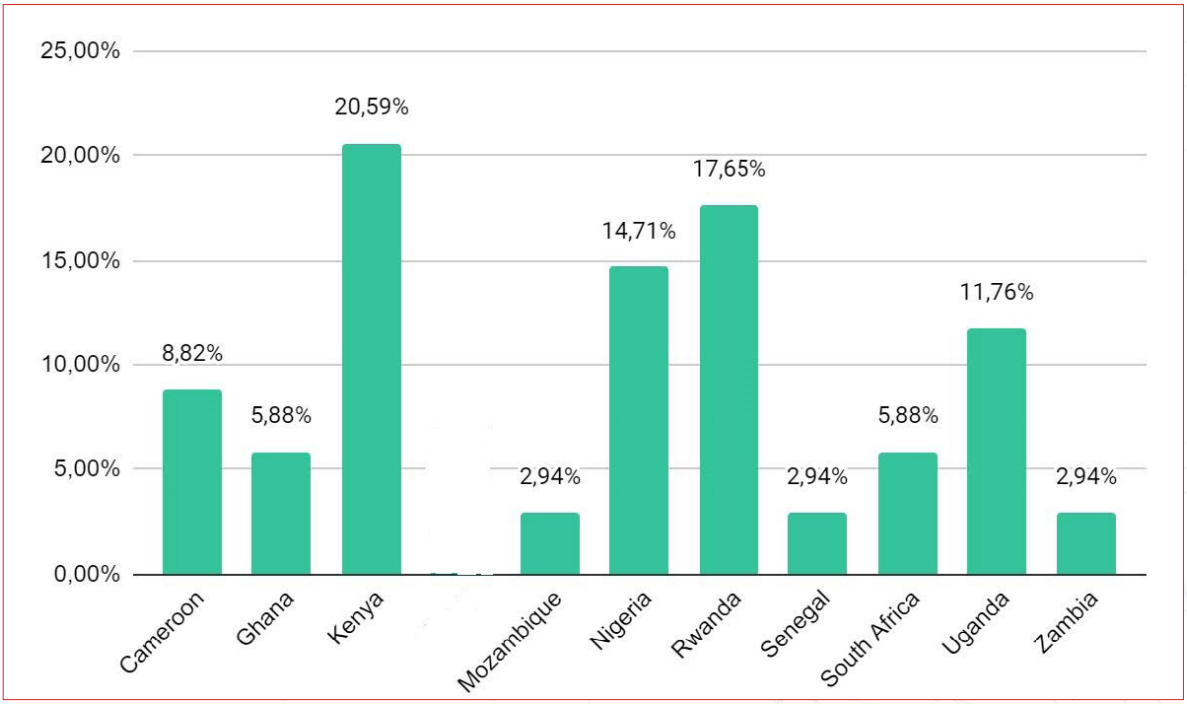
Figure 3 | Deployment of AI across the agriculture value-chain in Africa



Source: Thomas Hervé Mboa Nkoudou, *State of AI in Agriculture in Sub-Saharan Africa*, International Centre of Expertise in Montreal on Artificial Intelligence (CEIMIA), 2024, p. 37, https://zenodo.org/records/13144813.

Figure 4 | Most active countries in developing AI solutions in agriculture



Source: Thomas Hervé Mboa Nkoudou, *State of AI in Agriculture in Sub-Saharan Africa*, cit., p. 38.

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5. Plugging Africa's digital infrastructure and skills gaps

Innovation and digitalisation are key to transforming African societies and economies and promote regional and continental integration, generate inclusive economic growth and stimulate job creation to absorb the ever-growing number of Africans joining the labour force every year. It is estimated that by 2050, Africa will have added nearly eight hundred million people to its labour force.[34] Partnerships and investments that help build the necessary digital skills, regulatory environment and infrastructure base can help unleash the continent's true economic potential. For instance, global digital trade (largely dominated by US and Chinese technology firms) represents a multi-billion-dollar industry. The US Department of International Trade and Administration estimates that the value of e-commerce globally will reach six trillion dollars in 2025.[35] In 2017 alone, e-commerce accounted for 12 per cent of global trade in goods - with Africa accounting for a small slice of global e-commerce revenues.

Supporting existing initiatives like the African Continental Free Trade Area (AfCFTA) that aim to create a single digital market has the potential to create economies of scale with a combined GDP of 2.5 trillion dollars – large enough to jump-start African economies and unlock economic opportunities for millions of young people. In countries with advanced digital infrastructure, e-commerce channels are increasingly being used by governments for the delivery of public services through for example visa processing and issuance, civil registration, tax payments and tendering.[36] Between 2012 and 2020, Africa's digital economy grew by 3.4 per cent of GDP and is expected to reach 5.2 per cent in 2025 and 8.5 per cent by the middle of the century.[37] With the appropriate infrastructure in place and an enabling regulatory framework, Africa's contribution to the global economy is expected to reach 720 billion dollars of GDP, far exceeding current contribution of 180 billion dollars.[38]

Building a secured digital market characterised by free movement of persons, goods, capital and services is critical to ensure that people and businesses can seamlessly access and engage in online activities in line with AfCFTA. To achieve this, African countries need to build necessary digital skills, cross border and transnational data infrastructure and capabilities to unleash this potential. At the moment, limited and unreliable energy and connectivity, inadequate data centres and poor infrastructure remain significant challenges to the creation of an African digital market. It is estimated that nearly three hundred million Africans live more

[34] David McNair (ed.), *Why Europe Needs Africa*, Washington, Carnegie Endowment for International Peace, 2024, https://carnegieendowment.org/research/2024/07/why-europe-needs-africa.
[35] US Department of Commerce International Trade and Administration, *2024 eCommerce Size and Sales Forecast*, 2024, https://www.trade.gov/ecommerce-sales-size-forecast.
[36] African Union, *The Digital Transformation Strategy for Africa*, cit.
[37] Ibid.
[38] Ibid.

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than fifty kilometres from a cable or fibre broadband connection,[39] hence the lack of widespread availability of high-speed and reliable broadband and connectivity remains a significant hurdle to connectivity and infrastructure roll outs. According to a report published by the International Finance Corporation (IFC), Africa needs about half a million kilometres of fibre-optic cable construction to provide continent-wide coverage.[40]

Despite these gaps, significant gains have been achieved in recent years. For instance, between 2019 and 2022, over 160 million Africans gained broadband access[41] – thanks to initiatives such as the "All Africa Digital Economy Moonshot" – a World Bank backed facility that aims to improve digital connectivity in Africa by 2030. As data costs drop and infrastructure gaps narrow, digital trade in Africa will continue to rapidly grow and is expected to constitute a growing share of intra-continental trade by the middle of the century. To support the roll out of digital services and skills, tech innovators and entrepreneurs are forming communities of practice to share experiences, learn from each other's successes and brainstorm new innovations to meet the needs of the industries and sectors they work with. Unlocking Africa's digital economy potential will involve closing infrastructure gaps, promoting data sovereignty, expanding internet connectivity, reducing connectivity costs and building a cohort of trained professionals with high-level digital skills. To achieve this, collaboration between governments, development partners and the private sector is crucial.

Access to affordable and reliable energy is a cornerstone of sustainable socioeconomic development, and a stable energy supply is essential to underpin the large-scale deployment of digitalisation initiatives across sectors. While the continent has abundant energy sources including 7.2 per cent and 13 per cent of global oil and natural gas reserves respectively, over half of the population lacked access to electricity in 2023.[42] Furthermore, Africa's energy consumption is disproportionately low, accounting for less than 4 per cent of global energy use, with just 1.1 per cent of electricity generation and 3 per cent of industrial energy consumption worldwide.[43] Specifically, sub-Saharan Africa has the lowest electricity consumption per capita globally, averaging around 600 kWh annually. In some countries, such as Niger, this figure drops to just 54 kWh per year, starkly

[39] European Commission AU-EU Digital Economy Task Force, *New Africa-Europe Digital Economy Partnership. Accelerating the Achievement of the Sustainable Development Goals*, June 2019, https://digital-strategy.ec.europa.eu/en/node/1744.

[40] International Finance Corporation (IFC), *Fiber-Optic Cables Connect Africa to the Digital Economy*, 27 August 2019, https://www.ifc.org/en/stories/2010/fiber-optic-cables-connect-africa-to-digital-economy.

[41] World Bank, *Digital Transformation Drives Development in Africa*, 18 January 2024, https://www.worldbank.org/en/results/2024/01/18/digital-transformation-drives-development-in-afe-afw-africa.

[42] International Energy Agency (IEA) website: *Africa: Energy Mix*, https://www.iea.org/regions/africa/energy-mix.

[43] IEA, *Africa Energy Outlook 2022*, June 2022, https://www.iea.org/reports/africa-energy-outlook-2022.

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contrasting with the global average of 3,000 kWh per year.[44]

Similarly, investments in Africa's Renewable Energy sector are low, potentially stalling the expansion of decentralised energy infrastructures and limiting the adoption of energy intense technologies like AI, cloud computing, e-commerce and others. According to Data Center Map, Africa, home to over 1 billion people, hosts just 183 data centres across 33 countries.[45] In contrast, Canada has 264, Japan 182 and the United States boasts more than 3,600 data centres. These disparities highlight the continent's significant infrastructure gaps. As African countries scale up investments in AI-driven technologies amid rapid population growth – projected to exceed 2.5 billion by 2050 closing energy access gaps and building resilient, future-ready energy systems will demand bold, forward-looking policy interventions. Innovations in energy infrastructure, backed by smart regulation and strategic planning, is essential to meet the rising demand while enabling inclusive, low-carbon energy development.

6. Navigating geopolitical competition: Strengthening Italy's digital partnerships with Africa

Unless urgently addressed, geopolitical competition over Africa's digital future will likely lead to fragmented digital initiatives, disjointed regulatory frameworks and overlapping projects that may further entrench structural disparities and exacerbate the digital divide.[46] For instance, by 2020, China had concluded cooperation agreements with at least sixteen African countries under the Digital Silk Road Initiative (DSR).[47] DSR is China's global digital infrastructure undertaking involving Chinese technology companies building telecommunications networks, AI capabilities, cloud computing, e-commerce, surveillance technologies and other high-tech innovations around the world.

Similarly, the United States, EU and other powers are deploying a combination of financial investments, strategic policy frameworks and geopolitical engagement aimed at securing technological, economic and normative leadership on the continent. With financial backing of 150 billion dollars for Africa alone,[48] the EU's Global Gateway in combination with initiatives like the AU-EU Digital4Development

[44] Ibid.

[45] Data Center Map website: https://www.datacentermap.com/datacenters.

[46] Ennatu Domingo et al., "The Geopolitics of Digital Literacy and Skills Cooperation with Africa", in *ECDPM Discussion Papers*, No. 369 (June 2024), https://ecdpm.org/work/geopolitics-digital-literacy-and-skills-cooperation-africa.

[47] US Congress, *China's Strategic Aims in Africa*, Hearing before the U.S.-China Economic and Security Review Commission, 8 May 2020, https://www.uscc.gov/sites/default/files/2020-06/May_8_2020_Hearing_Transcript.pdf.

[48] European Commission DG for International Partnerships website: *EU-Africa: Global Gateway Investment Package*, https://international-partnerships.ec.europa.eu/node/2530_en.

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(D4D) Hub and #TeamEurope Initiatives like Digital Health) are aligning development assistance, private capital, technological aid and research cooperation to shape Africa's digital transformation agenda. In 2022, the US Administration of President Joe Biden (2021-25) launched its Digital Transformation with Africa Initiative (DTA) backed by an 800-million-dollar financial package. International financial institutions like the World Bank, European Investment Bank, International Monetary Fund and African Development Bank are involved in joint or leading parallel initiatives across the digital spectrum. To harness global digital competition for their own development, African countries need to institutionalise policy and regulatory frameworks and harmonise strategies – ensuring that initiatives are demand-driven and that investments align with and complement national development efforts and continental priority needs.

Individual EU member states are also developing their own digital partnerships with Africa – and a notable example is Italy's Digital Flagship with Africa – part of its Piano Mattei.[49] Italy is pursuing a hybrid approach that blends traditional development cooperation with external policy objectives, leveraging a mix of financing instruments including loans, grants and private capital to shape Africa's digital policy landscape.[50] This strategy is operationalised through centring digital transformation in the "six thematic pillars" of the Mattei Plan. As African countries navigate geopolitical competition and craft their own digital strategies and identify priority areas to secure long-term technological, economic and data sovereignty, the end goal must be to achieve maximum impact with technology as an enabler of sustainable development and human progress. Initiatives like the AI Hub for Sustainable Development Start-Up Accelerator Pilot, a project between the Italian government and UNDP, has attracted over three hundred applications from cutting edge start-ups from the 14 priority countries of the Italy-Africa Mattei Plan. The programme is designed to assess effective, ethical and necessary partnerships to accelerate the development and adoption of Language AI technologies. It prioritises support for sustainable, locally driven innovations that incorporate enhanced safeguards such as advanced content moderation mechanisms, prompt filtering and improved reinforcement learning protocols to ensure responsible and trustworthy AI development.

The successful roll out of such initiatives largely depends on development of several elements that are critical to building reliable data infrastructure ecosystems. Africa's energy access gaps, skills shortage and poor energy infrastructure needs to be bridged through tailored trainings and innovative financing models for scalable infrastructure development in the energy, fibre connectivity and water sectors. Projections estimate that data centre energy consumption needed to

[49] Italian Chamber of Deputies Research Department, *D.L. 161/2023 - Disposizioni urgenti per il «Piano Mattei» per lo sviluppo in Stati del Continente africano*, 10 January 2024, https://temi.camera.it/leg19/provvedimento/disposizioni-urgenti-per-il-piano-mattei-per-lo-sviluppo-in-stati-del-continente-africano.html.

[50] Ibid.

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power AI driven technologies could reach 1,580 terawatt hours by 2034 – roughly equivalent to India's total energy consumption. Data centres alone are projected to be the world's third-largest consumer of energy, consuming more energy than the whole of EU put together. Due to their high energy intensity, data centres require substantial cooling systems, often consuming thousands of litres of water per hour to maintain optimal operating temperatures and ensure uninterrupted performance. These are critical sectors that require urgent interventions and investments. Italian firms aiming to deepen partnerships with African countries should prioritise investments in decentralised renewable energy systems to enhance energy access in areas underserved by national grids and physical infrastructure. In parallel, investments in rehabilitating wastewater infrastructure for agricultural and industrial use can improve resource efficiency in water stressed regions where resource scarcity could ignite new conflict dynamics. These interventions are critical enablers for the deployment of digital infrastructure ecosystems that support Africa's growth efforts.

7. Policy recommendations

Action in several areas would have a beneficial impact to strengthen Itay-Europe-Africa digital partnership across infrastructure development, skills training and policy frameworks:

- Align public and private sector investments and contributions with regional and sub-regional development strategies and priorities. A harmonised demand-driven-approach as opposed to a supply-driven-approach will mitigate the risk of disjointed digital development initiatives led by competing external actors.

- Prioritise targeted investments in strategic sectors that enhance fiscal capacity including scaling up investment in regional and transnational digital infrastructure such as interoperable payment systems, digital identity frameworks and cross-border e-governance platforms that facilitate economic integration, integrate informal economy and enhance domestic resource mobilisation.

- Private lending for Africa's digital infrastructure sector faces volatility and uncertainty, particularly during periods of economic or political crisis. This unpredictability drives up borrowing costs and delay or derail project implementation. Italian and European private lenders should explore risk-mitigation measures such as local currency lending to reduce exposure to risks and exchange-rate volatility. This will lower borrowing costs, stabilise project implementation and enhance the long-term viability of digital infrastructure investments in Africa.

- Scale up digital skills training aligning with labour market demands and the digital economy by investing in digital infrastructure that supports e-learning

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and remote education delivery, particularly in rural and underserved communities.

- Invest in large scale transformative development projects that impact socioeconomic outcomes and lead to improved quality of life. For example, investments in decentralised energy and water systems to support both sustainable growth while bridging digital divides.

- Consider the creation of coordination platforms (private sector, civil society, academia, governments) where public and private sector investments and contributions are reviewed and aligned with regional and sub-regional digital and development strategies. This will ensure that investments are aligned with the Digital Flagship Project goals and are effectively contributing to the development of regional and sub-regional frameworks in pilot countries.

- Support local value creation mandates by ensuring that private digital investments contribute to skills development, local content creation and infrastructure sharing. This will enhance digital adoption and relevance.

- Digital transformation is only impactful when paired with human capital development. Integrating digitalisation with education and training implies continuous monitoring and reporting to minimise harm, eliminate algorithmic bias and surveillance risks.

- Italy's bilateral and fiscal reach in Africa is limited; therefore, an EU-coordinated approach addresses Italy's limited fiscal capacity and reach. Through #TeamEurope and existing programmes, including EU-AU digital partnerships, Italy can offer a harmonised package of investment, regulation and capacity support. A unified EU voice helps avoid fragmented offers and strengthens Africa's digital sovereignty goals.

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