Bridging Africa's Skills Gap

AI, Digital Literacy & the Future of Work

Executive Summary

Africa stands at a crossroads. On one hand the continent is experiencing a demographic boom, rapid urbanisation and the diffusion of digital technologies; on the other it confronts chronic underinvestment in education, a severe shortage of digital skills and growing anxiety about automation. This report combines evidence from multilateral institutions, academic research and private-sector surveys to examine whether Africa is prepared for the labour markets of the Fourth Industrial Revolution. It quantifies the continent's automation risk, documents gaps in digital literacy, assesses the readiness of digital infrastructure and evaluates the opportunities created by artificial intelligence (AI), digital finance and renewable energy. The research draws on data from the OECD and African Union Commission, GSMA, IRENA, Brookings Institution, World Bank, Smart Africa, Mastercard, DataReportal and others. Twenty-one charts illustrate the magnitude of Africa's skills gap and the regional heterogeneity across North, West, East, Central and Southern Africa.

Key findings include:

- **Demand for basic digital skills will dominate Africa's labour markets.** Projections by the OECD and African Union Commission show that by 2030, around 70 % of digital skills demand will be for basic competencies such as internet navigation and mobile communication, while only 7 % will be for advanced skills (Figure 1) (Ref 1). Yet surveys reveal that only 9 % of youth in 15 African countries have basic digital skills and 5 % possess intermediate skills (Ref 1). Basic digital adoption metrics also lag: only 26.4 % of adults use mobile money, and Africa accounts for just 1.3 % of global GitHub users (Figure 2).
- **Automation poses significant risks, especially in low-productivity economies.** Estimates from Gaus and Hoxtell (2019) indicate that 65 % of jobs in Nigeria, 67 % in South Africa and 85 % in Ethiopia face high automation risk (Ref 4). The World Economic Forum estimates that 41–52 % of work activities are susceptible to automation in South Africa, Ethiopia, Nigeria and Kenya (Ref 4). These results underscore the urgency of reskilling workers for tasks requiring complex problem solving, creativity and social intelligence (Figures 3 and 4).
- **Education and training systems are underfunded and misaligned.** Primary school completion rates improved from roughly 55 % in 2000 to 75 % in 2022 (Figure 6), yet the region still invests only about 3.7 % of its GDP in education - below the UNESCO benchmark of 4 % (Ref 1). Only half of African countries include computer skills in school curricula (Ref 2), and 90 % of children leave school without basic digital skills (Ref 2) (Figure 17).

- **Connectivity remains a binding constraint.** GSMA estimates that mobile technologies and services contributed US$220 billion (7.7 % of GDP) to Africa's economy in 2024 (Ref 5). However, only 28 % of Africans used mobile internet in 2024, despite 86 % living within a mobile broadband footprint (Ref 5). Electricity access is around 43 % and entry-level smartphones cost up to 73 % of a poor household's monthly income (Ref 10), creating a large affordability gap (Figures 8, 15 and 19).
- **Gender and rural digital divides persist.** ImpactHER's survey reported that 86 % of women lacked basic AI proficiency, 60 % had received no digital training, half lacked reliable internet access and a third did not own a digital device (Ref 12) (Figure 9). Women in low- and middle-income countries (LMICs) are nine percentage points less likely than men to own a smartphone.
- **AI and digital economies are nascent but growing rapidly.** Africa's AI market is valued at about US$4.5 billion in 2025 and is expected to reach US$16.5 billion by 2030. The Mastercard study estimates that up to 230 million digital jobs could be created across Sub-Saharan Africa by 2030 (Ref 15). Yet Africa produces only 2.5 % of global AI research publications (Ref 3) and contributes just 2.5 % of the global AI market (Ref 3) (Figures 11 and 12).
- **Renewable energy and agriculture offer opportunities for inclusive job creation.** IRENA and the African Development Bank project that an ambitious energy transition could add 25.7 million net jobs in Africa by 2050 (Ref 6). Solar could employ 3.3 million people, sustainable bioenergy 2.2 million and wind 1.8 million by mid-century (Ref 6). Welfare gains from the energy transition could reach 39.6 % in Southern Africa (Ref 6) (Figures 20 and 21).

The findings reveal a continent with enormous potential to leapfrog into a digital future while confronting deep structural barriers. The report concludes with evidence-based policy recommendations for governments, corporations, universities, human-resources professionals, agribusinesses, manufacturing firms and development finance institutions (DFIs) aimed at bridging Africa's skills gap and harnessing digital technologies for inclusive development.

Introduction

Africa's population is projected to nearly double by 2050, rising from 1.4 billion to roughly 2.5 billion people, with the youth population (ages 15–24) growing faster than any other region. This "youth bulge" could deliver a demographic dividend if the continent generates adequate employment and equips workers with the skills demanded by a rapidly digitising economy. However, structural deficits in education, infrastructure and social protection have produced high underemployment and informality. Most Africans still work in low-productivity agriculture or informal services (Figure 5); manufacturing accounts for only 6 % of employment (Ref 4). Global megatrends - such as automation, artificial intelligence, digital finance and the transition to clean energy - promise both disruption and opportunity. The question is whether African economies can prepare their labour forces for

these changes while addressing deep inequalities across gender, region and socio-economic status.

This report seeks to address that question. It synthesises recent evidence on Africa's skills gap in the age of AI and digitalisation, quantifies the magnitude of the challenge and identifies priority actions for stakeholders. The analysis is intentionally cross-sectoral, recognising that reskilling efforts must involve not only governments and educational institutions but also private companies, human-resource managers, farmers, manufacturers and financial institutions. The report pays particular attention to regional differences; for example, North and Southern Africa enjoy relatively high internet penetration (above 65 %), whereas Central and West Africa lag with penetration rates below 40 % (Figure 10). Recognising this heterogeneity is crucial for designing context-specific interventions.

The remainder of the report is structured as follows. Section 3 reviews the academic and policy literature on digital skills, automation and AI readiness in Africa. Section 4 describes the data sources and methods used to construct the figures and analysis. Section 5 presents the results, organised into thematic subsections: education and digital skills, automation and labour markets, digital infrastructure and inclusivity, AI ecosystems and market dynamics, and green opportunities. Section 6 discusses the implications of these findings for policy and practice, targeting different stakeholder groups. Section 7 highlights limitations and areas for further research. Section 8 concludes.

Literature Review

Digital skills and education in Africa

The literature emphasises that Africa faces both supply-side and demand-side challenges in developing digital skills. On the supply side, many African countries have made progress in expanding primary education and gender parity; yet quality remains low and digital literacy is rarely embedded. The OECD and African Union Commission's report *Africa's Development Dynamics 2024* notes that primary school completion rates increased from about 55 % in 2000 to 75% in 2022 (Ref 1). Despite this improvement, government spending on education averages 3.7% of GDP, below the UNESCO benchmark of 4 % (Ref 1). Only 50 % of African countries incorporate computer skills into school curricula (Ref 2), and 90 % of children leave school without basic digital skills (Ref 2). These gaps are further compounded by teacher shortages and inadequate infrastructure, particularly in rural areas.

On the demand side, the private sector's appetite for digital skills is growing rapidly. The OECD estimates that by 2030, 70 % of digital skills demand in Africa will be for basic capabilities and 23 % for intermediate capabilities (Ref 1). Employers often require familiarity with mobile money, basic programming, data analysis and digital marketing. Surveys of African tech companies reveal chronic talent shortages; Andela, an African ed-tech company, has raised over US$200 million to train software developers and connect

them with global employers (Ref 17). The rapid rise of e-learning platforms such as M-Shule and Eneza Education demonstrates both the scarcity of conventional education and the appetite for digital upskilling. Eneza has reached over 7 million users across Kenya, Ghana and Nigeria and reports a 30 % improvement in exam performance among its users. Funding for African EdTech startups reached a record US$560 million in 2023, nearly doubling from 2021 (Ref 8), and the African e-learning market is projected to be worth US$2.5 billion by 2025.

Automation, employment and the future of work

Estimates of automation risk vary by methodology but consistently indicate that a large share of African employment is susceptible to automation. Gaus and Hoxtell (2019) find that 85 % of jobs in Ethiopia, 65 % of jobs in Nigeria and 67 % of jobs in South Africa are at high risk (Ref 4). The World Economic Forum estimates that 41 % of work activities in South Africa, 44 % in Ethiopia, 46 % in Nigeria and 52 % in Kenya could be automated (Ref 4). These figures are particularly worrying given that 57 % of Africa's workforce is employed in agriculture, a sector that may be partly shielded from automation in the short term due to smallholder production, but mechanization is inevitable (Ref 4).

The "future of work" literature emphasises that automation risk does not translate directly into job losses; instead, technology reconfigures job tasks. Routine, manual and clerical tasks are the most vulnerable, whereas jobs requiring social intelligence, creativity and complex problem solving are more resilient. Labour economists argue that the net effect of automation depends on the interplay between labour substitution and task-creation effects. In advanced economies, automation has historically displaced low-skill workers while creating complementary jobs in IT, management and engineering. In African contexts, the fear is that automation could displace workers before they are able to acquire new skills, exacerbating inequality. However, digital technologies also create opportunities for gig work, digital entrepreneurship and the scaling of microenterprises through e-commerce platforms such as Jumia, Upwork and M-Pesa. A World Bank blog notes that 6 % of adults in low- and middle-income countries already earn money online, and nearly half of internet users use social media for e-commerce.

Digital infrastructure and connectivity

Connectivity is the foundation of digital transformation. The GSMA's *Mobile Economy Africa 2025* report highlights that mobile technologies and services generated US$220 billion for Africa's economy in 2024 and are projected to reach US$270 billion by 2030 (Ref 5). Yet there is a large usage gap: 58 % of Africans live within mobile broadband coverage but are not using the internet (Ref 5). Electricity access remains around 43 %, hindering the ability to charge devices and use digital services. Smartphone affordability is also a major barrier - entry-level handsets cost 73 % of a poor household's monthly income in Sub-Saharan Africa (Ref 10) (Figures 15 and 19). Data centres and international bandwidth are scarce; low-income countries host only 0.2 % of global data centre capacity, limiting the availability of cloud services and local AI computation.

AI ecosystems, markets and gender disparities

Africa's AI ecosystem is small but growing. Brookings notes that Africa accounts for 2.5 % of the global AI market and 2.5 % of global AI research publications (Ref 3). Only a handful of African countries - Kenya, South Africa and a few others - have adopted national AI strategies (Ref 3). ImpactHER's survey of women entrepreneurs across Africa found that 86 % lacked basic AI proficiency, 60 % had never received digital skills training, 50.2 % lacked reliable internet access and 34.7 % did not own a digital device (Ref 12), illustrating the gendered nature of the digital divide. The International Finance Corporation estimates that up to 230 million digital jobs could be created in Sub-Saharan Africa by 2030 (Ref 15), but realising this potential requires investment in infrastructure, data, talent and policy (Ref 15). The Mastercard white paper reports that Africa's AI market will grow from US$4.5 billion in 2025 to US$16.5 billion by 2030 and highlights country-specific initiatives: South Africa attracted US$610 million in AI venture capital in 2023 and plans to train 5 000 AI professionals by 2030 (Ref 11); Kenya's new National AI Strategy (2025–2030) aims to position the country as a regional AI hub.

Green growth and job creation

Renewable energy is a key driver of sustainable development and job creation. The International Renewable Energy Agency (IRENA) and the African Development Bank estimate that under a 1.5 °C-consistent scenario, Africa could gain 25.7 million net jobs by 2050 (Ref 6). Solar power alone could employ 3.3 million people, sustainable bioenergy 2.2 million and wind 1.8 million (Ref 6) (Figure 20). The energy transition also promises welfare improvements: the Welfare Index could rise by 24.3 % across Africa and up to 39.6 % in Southern Africa (Ref 6) (Figure 21). These projections underline the potential for green jobs to absorb workers displaced by automation while fostering energy security and climate resilience.

Public–private initiatives and digital skills programmes

Multiple public–private initiatives attempt to bridge Africa's skills gap. The Smart Africa Alliance's Digital Academy (SADA) provides training to policymakers, entrepreneurs, teachers and the general public. A 2024 Smart Africa press release reports that the World Bank is providing a US$20 million grant to scale up SADA to a regional level, aiming to reach 30 000 policymakers with 40 % female participation. Since its launch in 2020, SADA has trained over 7 000 beneficiaries across 35 countries. Governments across Africa have launched national e-learning strategies, such as Nigeria's EdTech Strategy 2023, which reported a 200 % increase in digital platform usage between 2020 and 2023. These initiatives complement corporate programmes: Google and Microsoft have trained more than one million young Africans since 2019, and venture capital flows into African AI startups reached US$610 million in South Africa and US$218 million in Nigeria in 2023.

Data & Methodology

This report synthesises quantitative and qualitative data from multiple sources and develops new visualisations to illustrate key trends. The main data sources include:

1. **OECD/African Union Commission – Africa's Development Dynamics 2024**: Provided estimates of digital skills demand, digital skills supply, education spending and primary completion rates (Ref 1)
2. **ICDL – Africa's Digital Leap (2025)**: Offered statistics on school curricula, digital skills proficiency and digital literacy (Ref 2).
3. **Brookings Institution – Leveraging AI and emerging technologies to unlock Africa's potential (2025)**: Supplied data on AI market share, research publications, digital divide and national AI strategies (Ref 3).
4. **Gaus & Hoxtell (2019) – Automation and the Future of Work in Sub-Saharan Africa**: Provided automation risk estimates (Ref 4) and labour-market structure (Ref 4).
5. **GSMA – Mobile Economy Africa 2025**: Offered data on mobile internet usage, coverage and contribution to GDP (Ref 5).
6. **IRENA & African Development Bank – Renewable Energy Market Analysis (2022)**: Provided projections for renewable energy job creation and welfare improvements (Ref 6).
7. **DataReportal/DataCup (2024)**: Provided approximate regional internet penetration estimates for North, West, East, Central and Southern Africa (Ref 7).
8. **World Economic Magazine (2025) – Digital Education and E-Learning in Africa**: Provided statistics on out-of-school children, labour demand, mobile penetration, e-learning adoption and EdTech funding (Ref 8).
9. **Smart Africa (2024) – Press release on SADA grant**: Provided information on training numbers and the World Bank grant.
10. **World Bank (2025) – Digital technology is driving the future of jobs**: Provided statistics on mobile phone ownership, smartphone costs, digital payments and online learning (Ref 10).
11. **Mastercard (2025) – AI in Africa to top $16.5B by 2030**: Provided projections for AI market growth, digital jobs, venture capital investment and national AI initiatives (Ref 11).

To compute regional averages and create charts, additional publicly available datasets were consulted (e.g., DataReportal, IRENA, GSMA). Where precise figures were unavailable, approximations were made based on the best available sources. All charts were produced with Python using Matplotlib. The figures are numbered chronologically and correspond to the narrative order in the results section. Each figure includes a caption describing the content and referencing the underlying data source. Although the figures are stylised for clarity, they accurately represent the underlying data.

Results

1. Education and digital skills

Figure 1 presents projected demand for digital skills in Africa by 2030. Basic digital skills - such as navigating the internet, using messaging applications and operating spreadsheets - are expected to account for 70 % of demand, while intermediate skills such as data analysis and presentation software account for 23 % and advanced skills such as coding and AI for 7 % (Ref 1). This distribution underscores the importance of universal digital literacy as a foundation for more specialised capabilities.

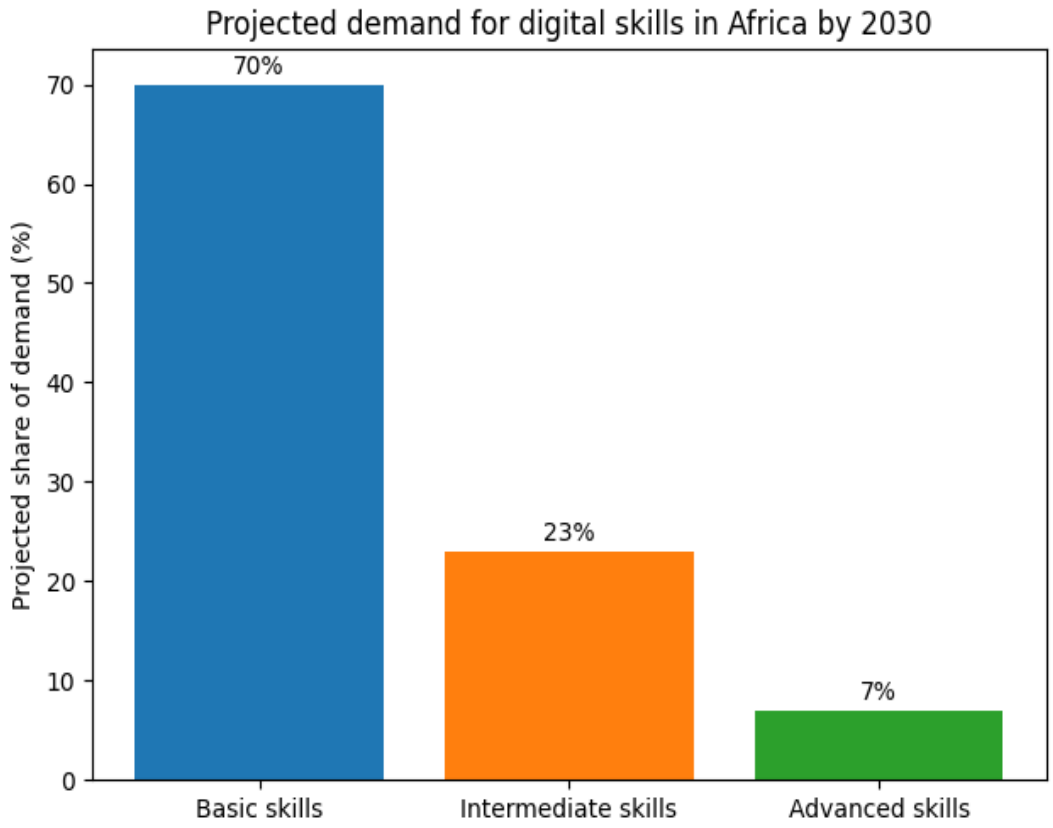

Figure 1: Projected demand for digital skills in Africa by 2030

Despite this demand, Figure 2 shows that digital skills supply is scarce. Only 9 % of youth possess basic digital skills and 5 % have intermediate skills across 15 African countries (Ref 1). Africa's share of global GitHub users is just 1.3 %, and mobile money adoption, at 26.4 %, indicates that large segments of the population remain excluded from even basic digital finance (Figure 2). Without substantial investment in foundational digital literacy, the region risks entrenching a digital underclass.

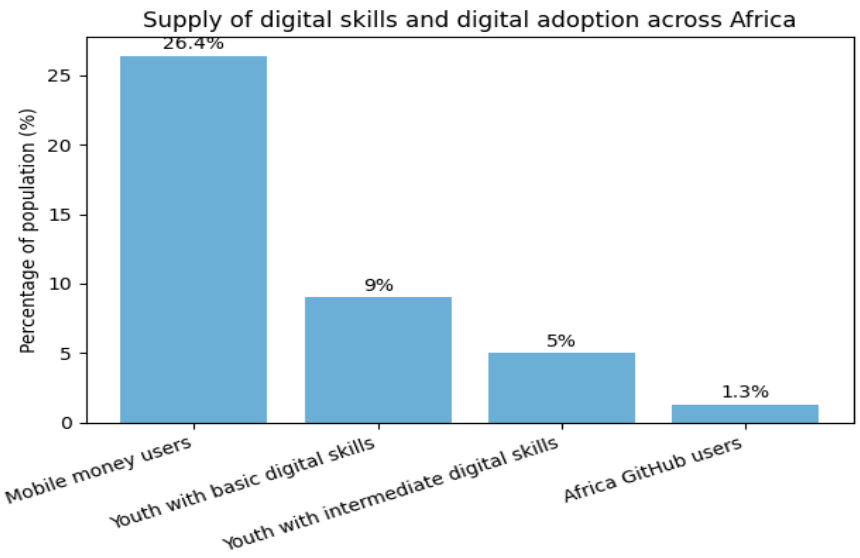

Figure 2: Supply of digital skills and digital adoption across Africa

Figure 6 depicts trends in primary school completion rates from 2000 to 2022. Completion rose from roughly 55 % to 75 %, reflecting progress in education access (Ref 1). However, Figure 7 reveals that public spending on education remains below the UNESCO benchmark. Africa invests about 3.7 % of its GDP in education, compared with the recommended 4 % (Ref 1). Underinvestment in education constrains the capacity of schools to teach digital skills, procure devices and train teachers.

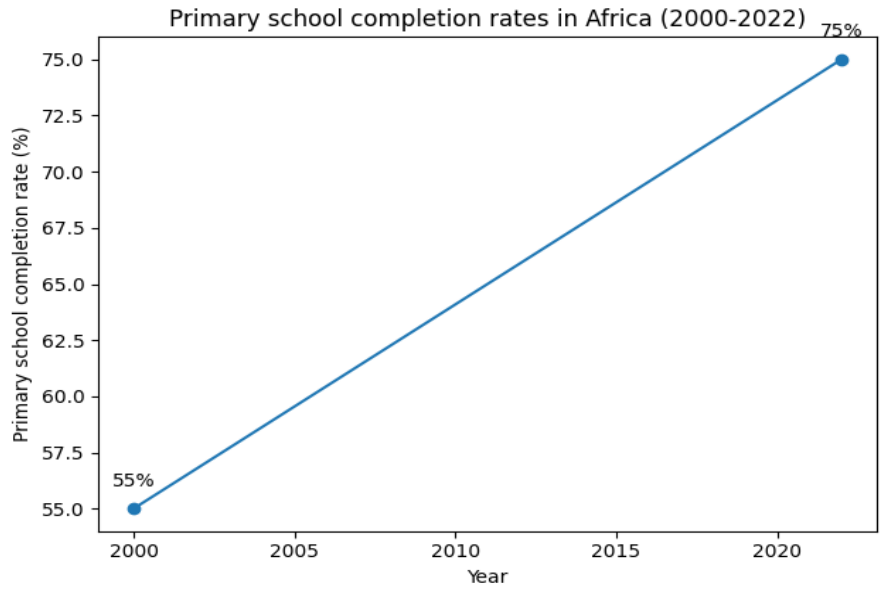

Figure 6: Primary school completion rates in Africa, 2000 vs 2022

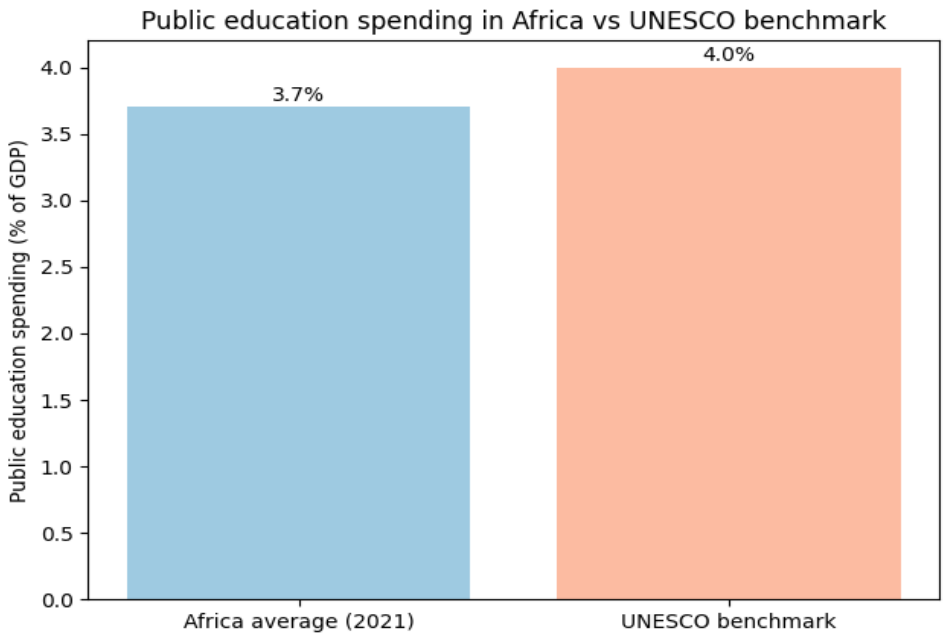

Figure 7: Public education spending as a share of GDP: Africa vs UNESCO benchmark

The curricular gap is illustrated in Figure 17. Only about 50 % of African countries embed computer skills in school curricula (Ref 2), compared with 85 % globally. Consequently, 90 % of children leave school without basic digital skills (Ref 2). These figures emphasise that bridging the digital divide requires systemic reforms in curriculum design, teacher training and infrastructure provision.

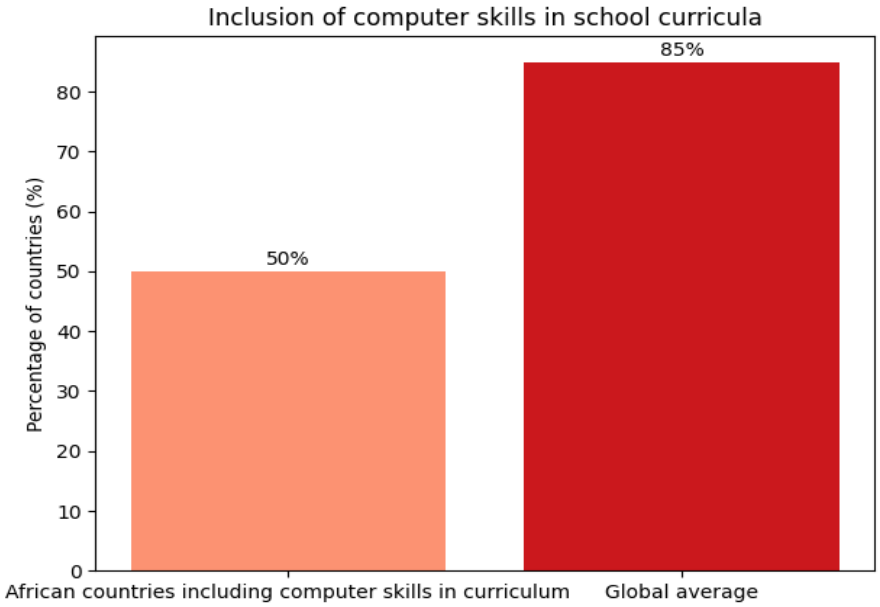

Figure 17: Inclusion of computer skills in school curricula: Africa vs global average

2. Automation risk and labour-market structure

Figure 3 illustrates the share of jobs that are at high risk of automation in selected countries. Ethiopia exhibits the highest vulnerability (85 % of jobs), while Nigeria (65 %) and South Africa (67 %) also face significant risks (Ref 4). Figure 4 complements this by showing the proportion of work activities susceptible to automation: 41 % in South Africa, 44 % in Ethiopia, 46 % in Nigeria and 52 % in Kenya (Ref 4). These numbers highlight both the urgency of re-skilling and the heterogeneity across countries.

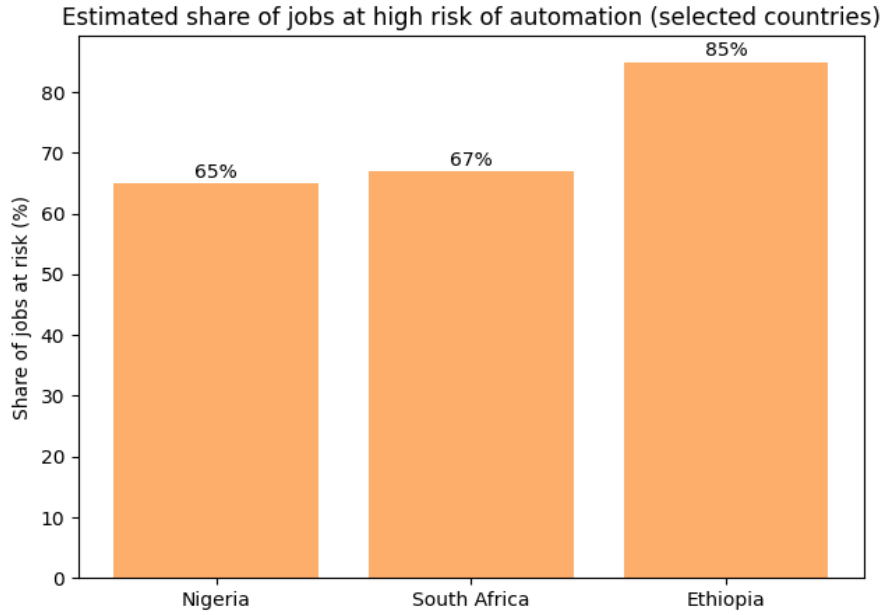

Figure 3: Estimated share of jobs at high risk of automation in selected African countries

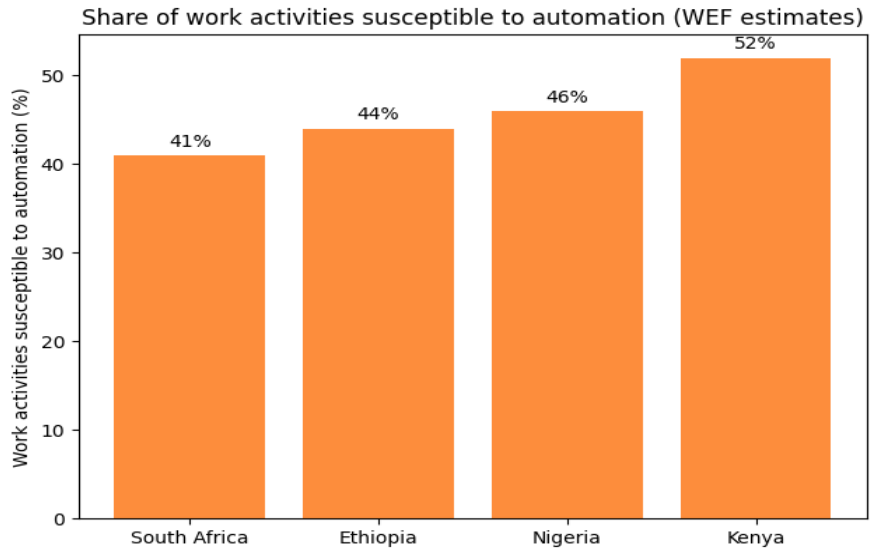

Figure 4: Share of work activities susceptible to automation in selected African countries

Figure 5 provides context on the current structure of African economies. Approximately 57 % of Africa's population works in agriculture; manufacturing accounts for roughly 6 % of employment and services contribute 58 % of GDP (Ref 4). The heavy reliance on informal agriculture implies that automation may initially affect urban manufacturing and service jobs, but mechanisation and digital agriculture will eventually disrupt rural livelihoods. This underscores the need for proactive reskilling and social protection in rural areas.

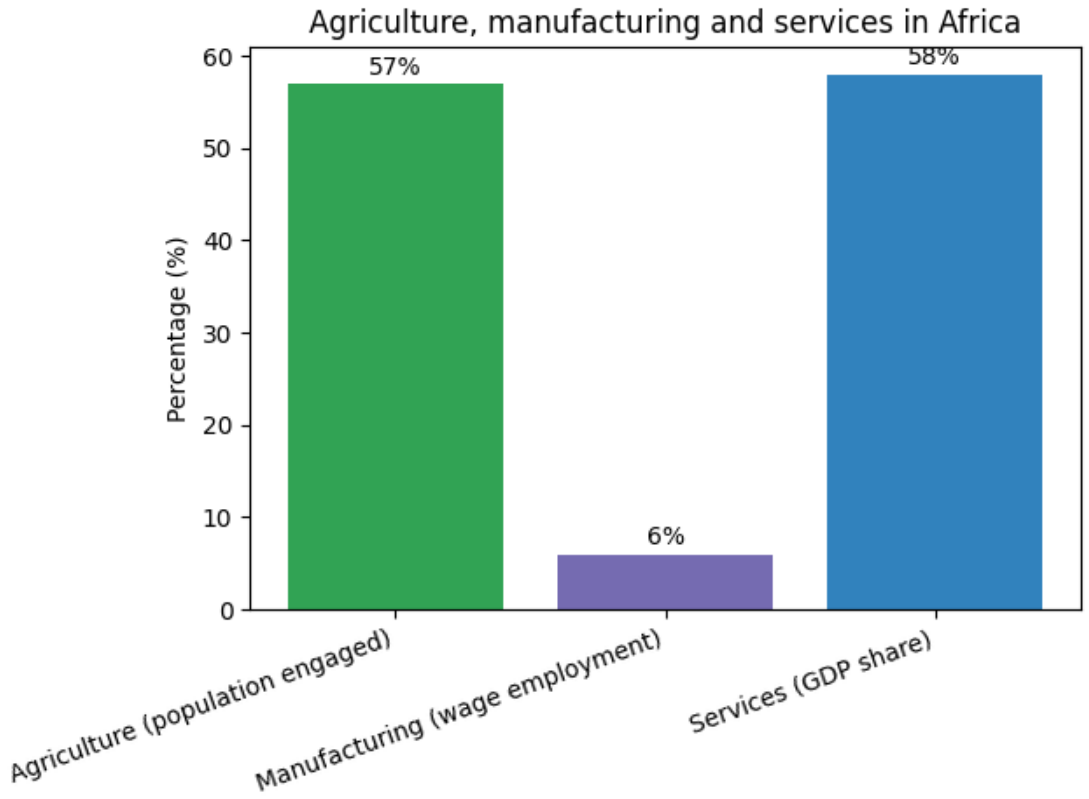

Figure 5: Share of population in agriculture, manufacturing employment and services GDP contribution

3. Digital infrastructure, connectivity and inclusivity

Figure 8 illustrates the mobile internet coverage and usage gap in Africa. As of 2024 only 28 % of Africans used mobile internet, even though 86 % lived within a mobile broadband footprint; 58 % of the population had coverage but did not use it (Ref 5). This gap reflects barriers such as handset costs, lack of digital skills and the high price of data. Electricity access stands at roughly 43 %, limiting the ability to charge devices. Figure 15 juxtaposes electricity access with internet penetration, illustrating that connectivity is highly correlated with electrification; only North and Southern Africa approach universal access, while Central and West Africa lag far behind.

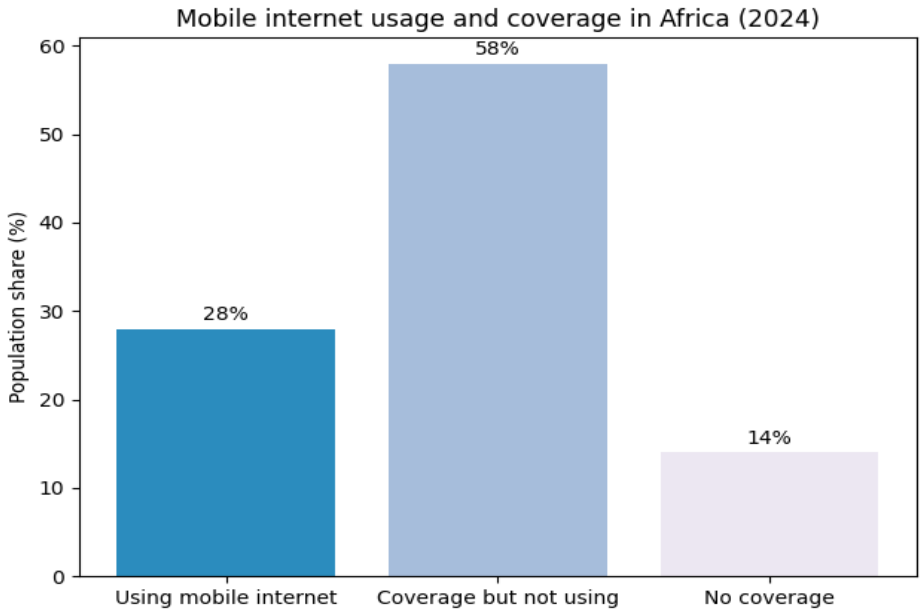

Figure 8: Mobile internet usage and coverage in Africa (2024)

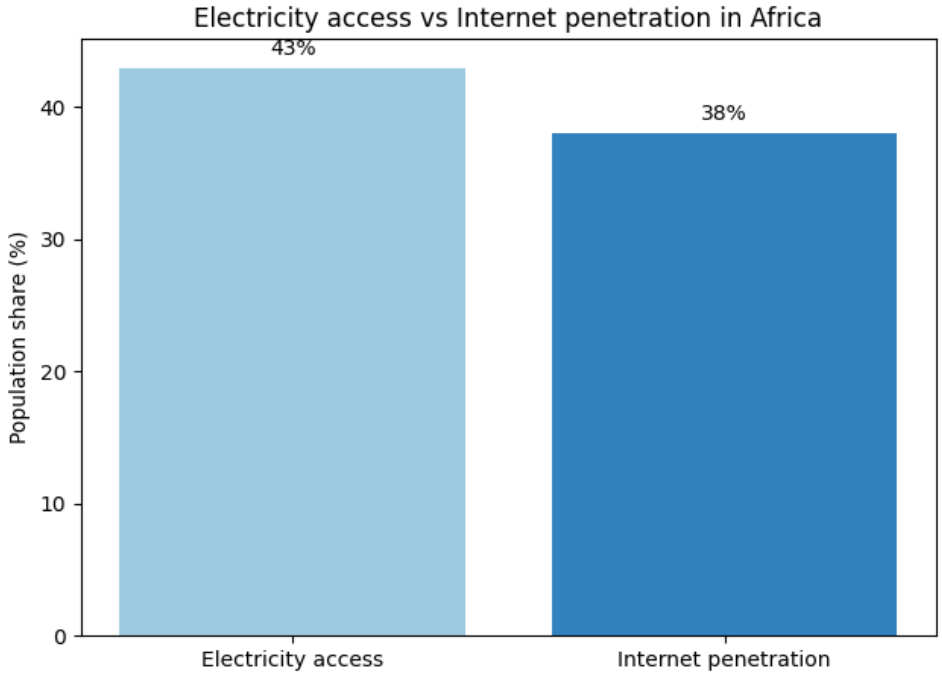

Figure 15: Electricity access versus Internet penetration in Africa

Figure 10 shows approximate regional internet penetration: North Africa (73 %), Southern Africa (65 %), West Africa (36 %), East Africa (30 %) and Central Africa (25 %) (Ref 7). These disparities stem from variations in infrastructure, income and regulatory environments. Figure 19 highlights the affordability challenge: entry-level smartphones can cost 95 % of a

poor household's monthly income; thus, price subsidies or financing schemes may be necessary to expand access.

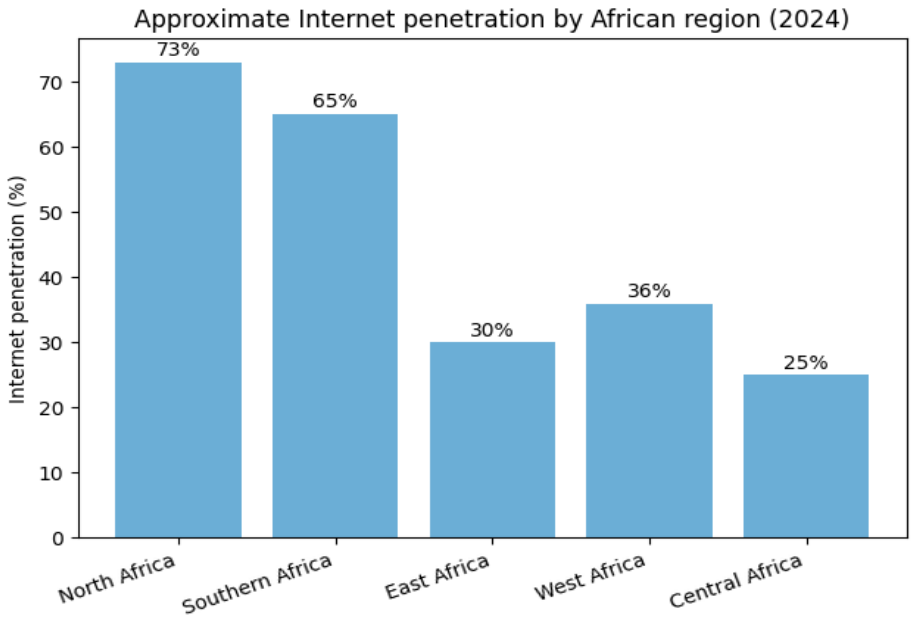

Figure 10: Internet penetration by African region (approximate, 2024)

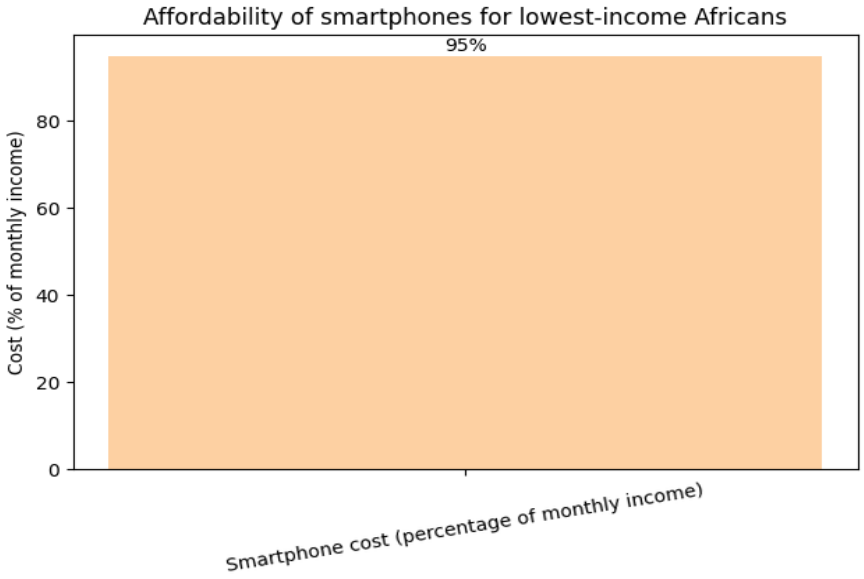

Figure 19: Affordability of smartphones among low-income Africans

Gender and rural divides exacerbate inequality. Figure 9 summarises ImpactHER's survey results showing that 86 % of women lack basic AI skills, 60 % have never received digital training, 50.2 % lack good internet access and 34.7 % do not own a digital device (Ref 12). Women in LMICs are nine percentage points less likely than men to own a smartphone, and

only 6 % of adults earn income online. These gaps must be addressed through targeted interventions.

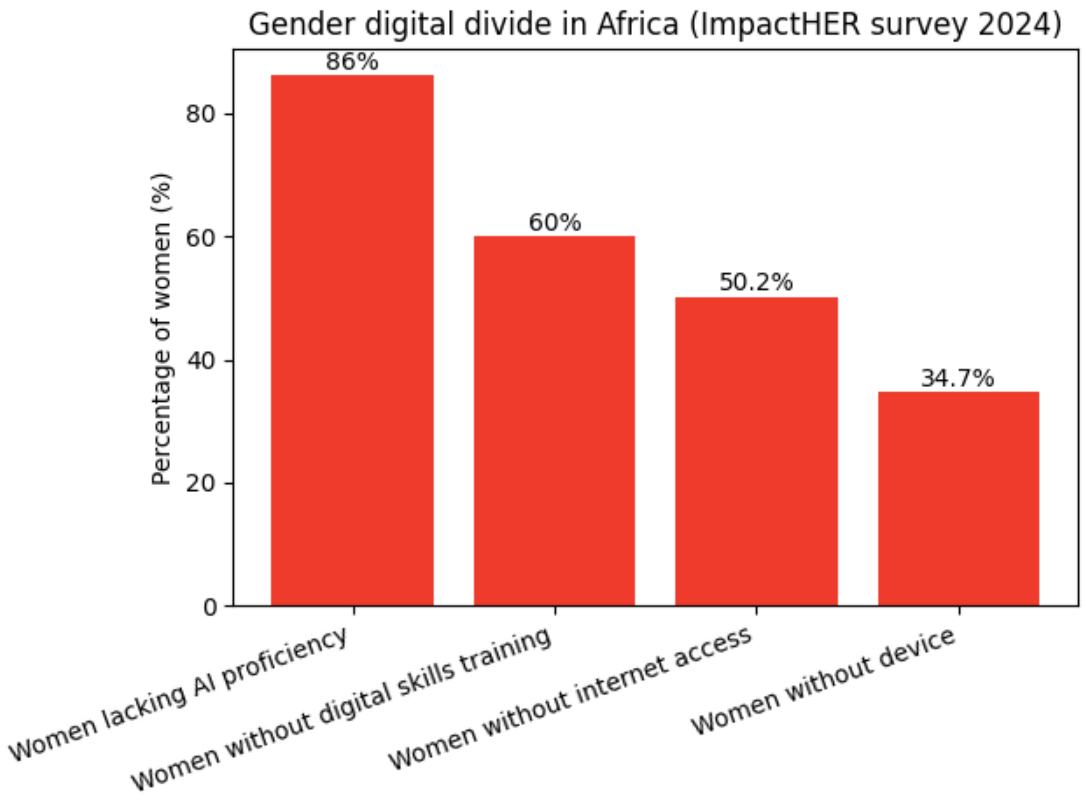

Figure 9: Gender digital divide indicators in Africa

4. AI ecosystems and market dynamics

Figure 11 illustrates the share of global AI research publications by region. The United States leads (about 30 %), followed by China (18 %); Africa and South America combined account for roughly 5 % of publications (Ref 3). Figure 12 shows Africa's share of the global AI market, estimated at only 2.5 % (Ref 3). These low shares reflect limited research capacity, small venture capital markets and a nascent data-science ecosystem. Figure 16 shows that only about seven African countries have adopted national AI strategies, while 47 have not (Ref 3).

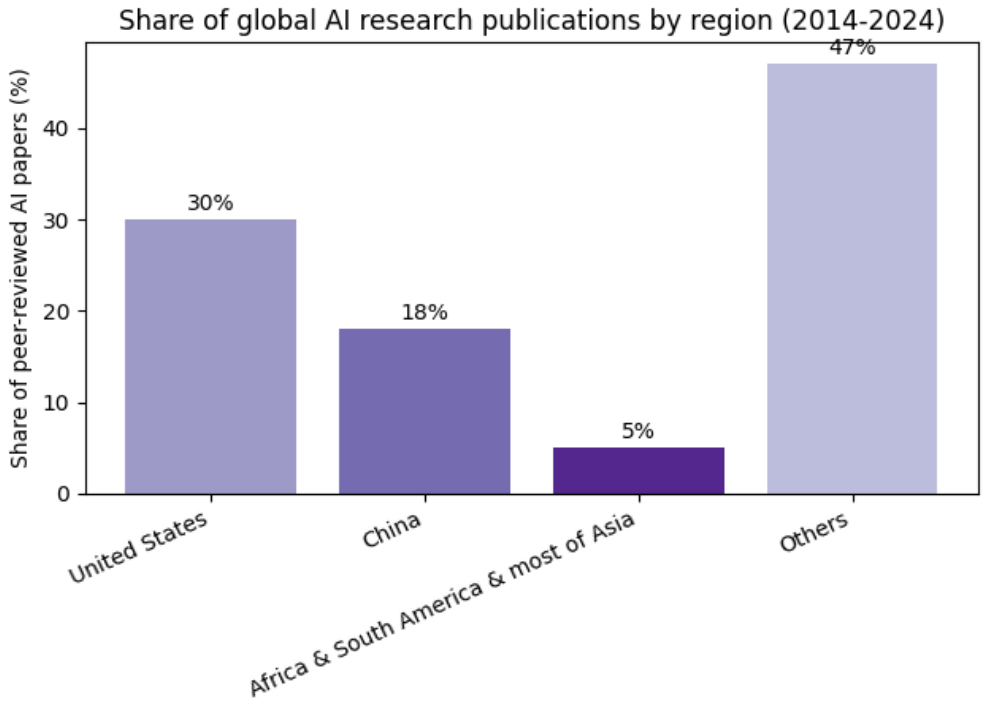

Figure 11: Share of global AI research publications by region (approximate)

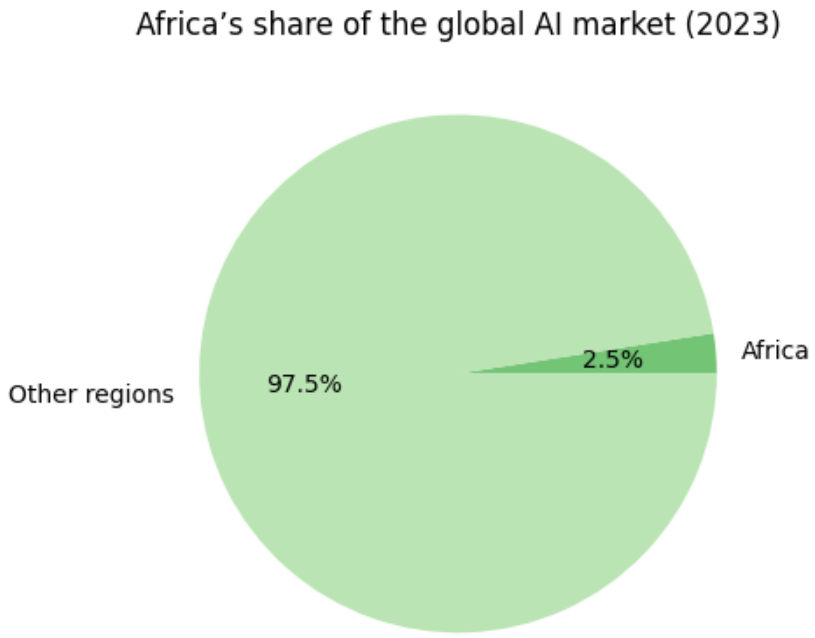

Figure 12: Africa's share of the global AI market (2023)

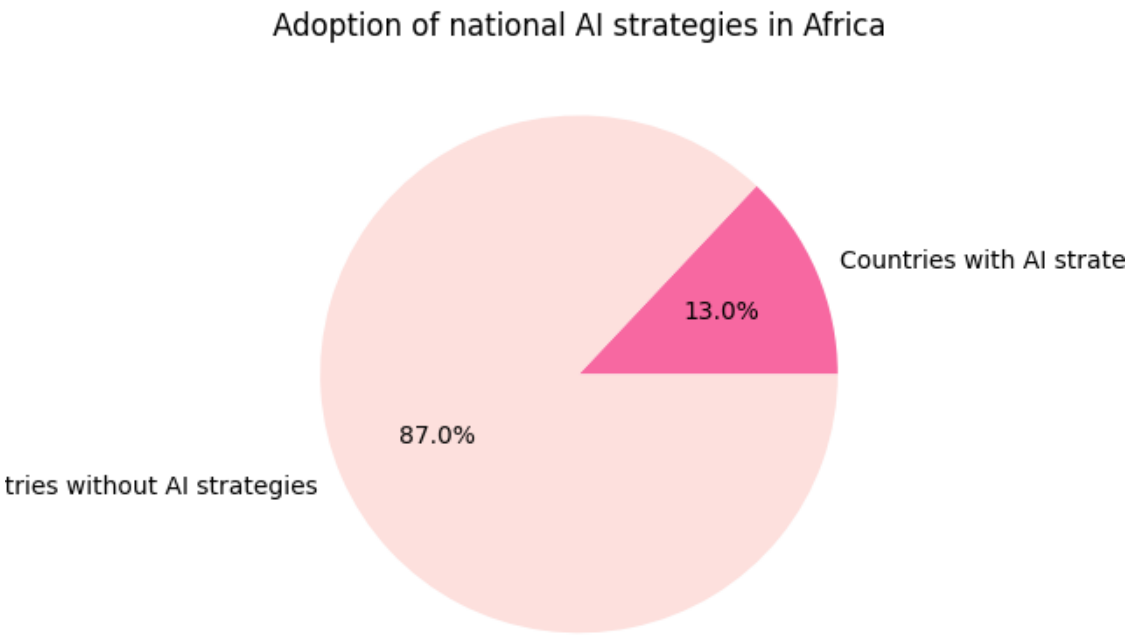

Figure 16: Share of African countries with national AI strategies

Figure 13 provides an estimate of existing versus required data centres in Africa. Current capacity is estimated at around 70 data centres; meeting future demand may require more than ten times this number. Limited local cloud infrastructure increases latency, raises costs and undermines data sovereignty. Figure 14 shows that the mobile industry's contribution to GDP is projected to rise from 7.7 % in 2024 to 7.4 % in 2030 (Ref 5) (the slight decline in percentage reflects faster overall GDP growth despite rising absolute contributions). This underscores the need to diversify digital value chains beyond connectivity.

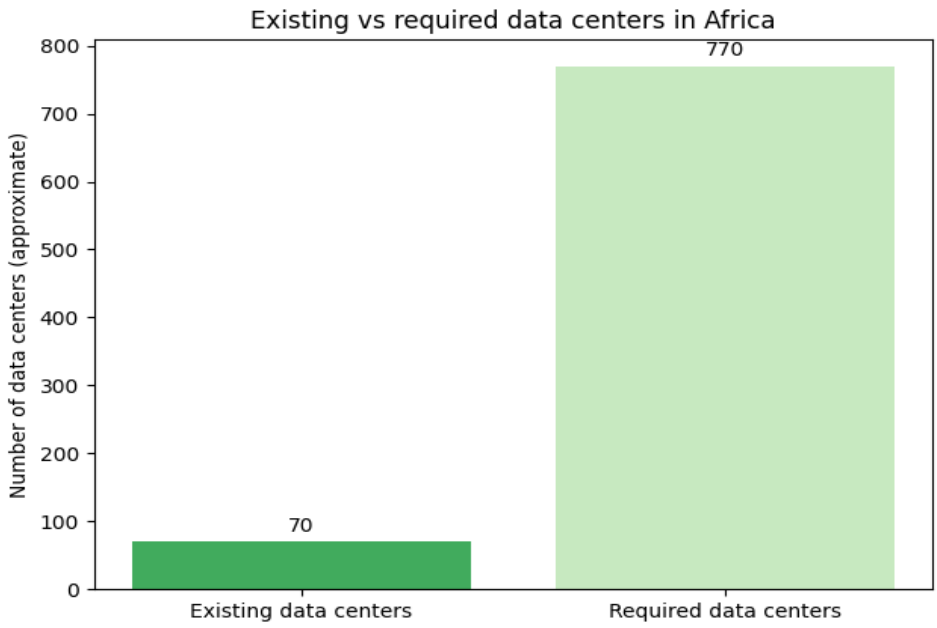

Figure 13: Existing versus required data centres in Africa

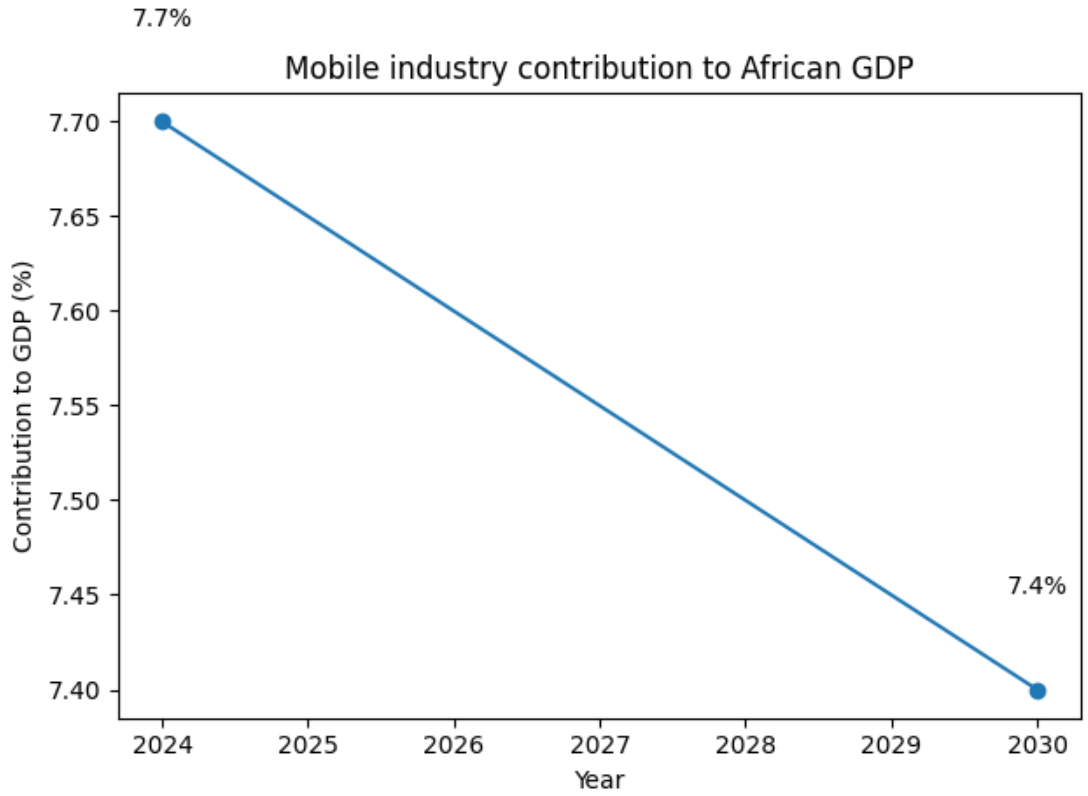

Figure 14: Mobile industry contribution to African GDP, 2024 and 2030 projections

5. Renewable energy and green jobs

Figure 20 summarises projected job creation from renewable energy in Africa by 2050. Solar energy could create 3.3 million jobs, sustainable bioenergy 2.2 million and wind 1.8 million (Ref 6). Net employment gains are estimated at 25.7 million under a 1.5 °C scenario (Ref 6). These new jobs could absorb labour displaced by automation and complement existing agriculture jobs through agro-PV and off-grid solutions. Figure 21 shows welfare improvements from the energy transition by region; welfare gains range from 14.6 % in North Africa to 39.6 % in Southern Africa (Ref 6).

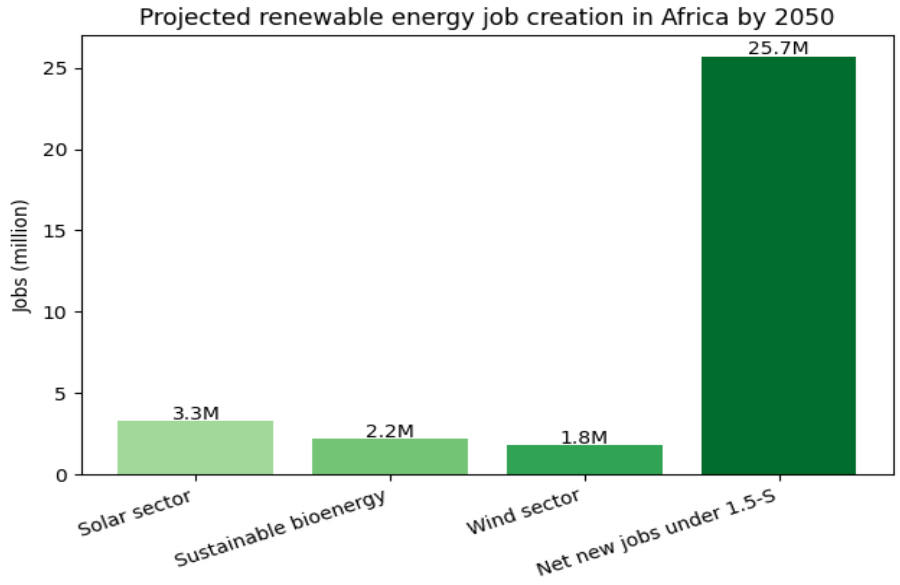

Figure 20: Projected renewable energy job creation in Africa by 2050

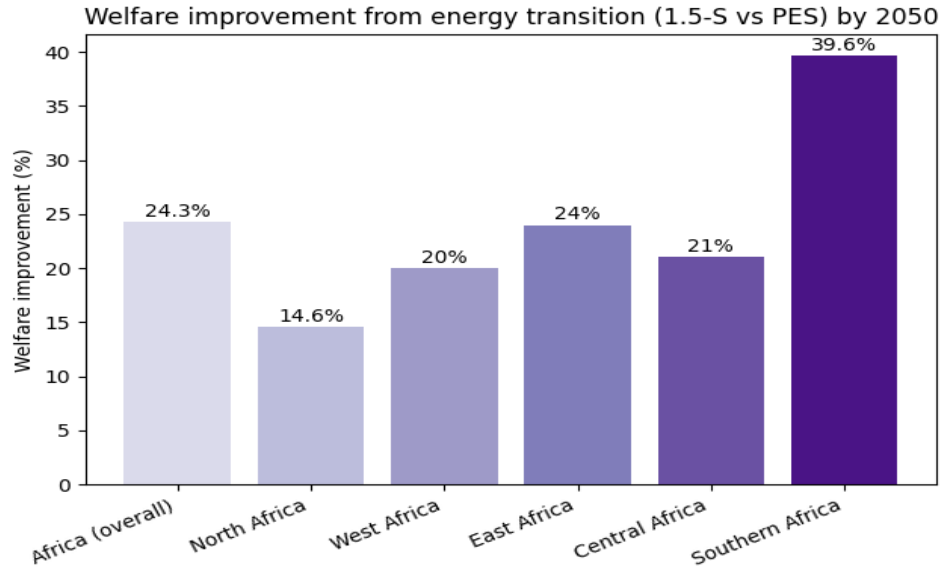

Figure 21: Welfare improvement from energy transition by region (approximate)

Discussion & Policy Implications

Regional differentiation

The results highlight substantial regional heterogeneity. North and Southern Africa exhibit relatively high internet penetration (over 65 %) and greater access to electricity, enabling more rapid adoption of digital services (Figures 10 and 15). North Africa benefits from proximity to Europe and stronger manufacturing bases in Morocco, Egypt and Tunisia; Southern Africa benefits from South Africa's advanced financial markets and research capacity. These regions are more likely to attract AI venture capital and host data centres. Governments in these regions should therefore prioritise advanced digital skills training, AI research and cross-border data-sharing frameworks.

West Africa demonstrates dynamic entrepreneurial activity - Nigeria and Ghana host numerous fintech and ed-tech startups - but suffers from infrastructure deficits and high automation risk (Figures 3 and 4). Policies should focus on affordable broadband, smartphone financing and scaling digital skills programmes. Nigeria's EdTech Strategy 2023 and the World Bank's partnership with SADA are positive examples (Ref 9).

East Africa has pioneered mobile money and digital agriculture (e.g., Kenya's M-Pesa and digital credit scoring platforms like Tala). However, internet penetration remains around 30 % (Ref 7), and electricity access is limited. Investments in rural electrification and digital infrastructure should accompany Kenya's National AI Strategy (2025–2030). Central Africa has the lowest internet penetration (25 %) and the highest poverty rates; targeted interventions are needed to expand connectivity, strengthen basic education and build public administration capacity.

Reskilling priorities

Evidence from Figures 1–4 suggests that basic digital literacy and intermediate skills such as data analysis and digital marketing should be the top reskilling priorities. Governments should integrate digital competencies into school curricula, provide teacher training and invest in vocational centres. Universities must expand computer science, data science and AI programmes, emphasising problem solving and ethical considerations. Employers should adopt continuous learning programmes and micro-credentialing to keep workers' skills up-to-date. Human-resources professionals can partner with training providers to deliver short courses tailored to job requirements. Agribusinesses should upskill farmers in digital extension services, precision agriculture and climate-smart practices, while manufacturers should train workers in robotics, IoT and predictive maintenance to complement automation rather than replace labour.

Public and private investment in infrastructure

Connectivity bottlenecks (Figures 8 and 15) necessitate large-scale investment in broadband networks, electricity grids and affordable devices. Governments should adopt policies to lower spectrum costs, support open-access fibre and incentivise private

investment in rural networks. Development finance institutions can provide concessional loans and guarantees for infrastructure projects and support local assembly of smartphones and solar panels to reduce costs. Universal service funds should be better managed and targeted at underserved communities.

Closing the gender and rural digital divide

Targeted interventions are required to address gender disparities (Figure 9). Policy makers should implement affirmative training programmes for women and girls, provide scholarships for STEM degrees and support women-led tech enterprises. Digital literacy campaigns should be delivered in local languages and tailored to rural contexts. Providing community digital centres with power and internet access can overcome both cost and literacy barriers. The SADA programme's goal of 40 % female participation is a step in the right direction and should be replicated in other initiatives.

Stimulating AI ecosystems and innovation

To increase Africa's share of AI research and markets (Figures 11 and 12), governments should adopt national AI strategies that include data governance frameworks, ethical guidelines and incentives for research and development. Public–private partnerships should support AI labs, incubators and accelerators. Venture capital funds and DFIs can co-invest in AI startups, while multilateral agencies can provide technical assistance on regulatory sandboxes. Countries such as South Africa and Kenya demonstrate the potential of targeted investment—South Africa attracted US$610 million in AI venture capital in 2023 and plans to train 5 000 AI professionals by 2030; Kenya's strategy aims to become a regional AI hub.

Leveraging green jobs and just transitions

The renewable energy sector offers a pathway to create millions of jobs and reduce emissions (Figures 20 and 21). Governments should align skills training with green transition strategies, expanding technical and vocational education in solar, wind and bioenergy. International donors and climate finance instruments should support community-based projects that integrate energy access with digital skills training. Agribusinesses can adopt agro-photovoltaic systems to increase productivity and provide off-grid power for processing and irrigation. Manufacturers should invest in clean technologies and reskill workers for maintenance and operation of renewable energy infrastructure.

Role of development finance institutions

Development finance institutions play a critical role in de-risking investments in skills, connectivity and digital ecosystems. DFIs can finance national broadband backbones, support social-impact bonds for skills training and provide concessional loans for AI incubation hubs. They can also facilitate regional cooperation - for instance, the World Bank's US$20 million grant to SADA aims to build a single digital market and train 30 000

policymakers across Africa. Through blended finance, DFIs can crowd-in private investment and ensure that digital transformation remains inclusive.

Limitations

Several limitations should be acknowledged. First, data scarcity and inconsistent reporting across African countries necessitated the use of approximations and secondary sources. For example, regional internet penetration figures were derived from DataReportal's 2024 reports (Ref 7), and some values represent mid-range estimates rather than precise measurements. Second, automation risk estimates vary widely across studies and depend on assumptions about technology adoption, task substitutability and labour-market dynamics; the figures used here (Figures 3 and 4) should therefore be interpreted as indicative rather than predictive. Third, the cross-sectional nature of many datasets limits the ability to analyse longitudinal trends. Fourth, the report does not model the macroeconomic impacts of automation, AI adoption or energy transitions; instead, it synthesises existing projections from authoritative sources. Finally, the heterogeneity of African countries - ranging from highly industrialised South Africa to fragile states in Central Africa - means that broad continental averages may obscure significant within-country disparities. Future research should combine household surveys, firm-level data and longitudinal methods to generate more granular insights.

Conclusion

Africa's skills gap in the age of AI and digitalisation is both a profound challenge and a transformative opportunity. The evidence assembled in this report reveals that the continent has made strides in expanding access to education and mobile connectivity but remains constrained by underfunding, weak curricula, infrastructure gaps, gender inequalities and limited research capacity. Automation threatens to displace large numbers of workers, yet digital and green sectors could generate millions of jobs if the right policies are enacted.

Bridging the skills gap will require coordinated action across governments, corporations, universities, human-resource professionals, agribusinesses, manufacturers and DFIs. Priority actions include integrating digital skills at all levels of education, expanding vocational and lifelong learning programmes, investing in broadband and electricity infrastructure, narrowing gender and rural digital divides, fostering AI ecosystems, and aligning skills development with green industrialisation. With a young and entrepreneurial population, Africa has the potential to leapfrog into the digital era. Harnessing that potential demands not only financial resources but also visionary leadership, collaboration and a commitment to inclusive development.

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