



## Trends and Innovation Impacting Capacity to Deliver on the African Agenda 2063



**Africa** is a continent of great promise – with a combined GDP of around \$3.5 trillion, the youngest and fastest-growing population in the world, and a diverse and extensive natural resource base. To realise this potential there needs to be significant investment in education, research and information sharing. Africa must be able to use new technology to create the knowledge, products and institutions to improve livelihoods. Although the technologies will allow Africa to leapfrog many old systems, they also require proactive and ongoing adaptation. Institutions and systems that cannot adapt will wither. The more structured for change the more likely it is that universities will be able to use the technological revolution to address the key drivers of change that impact progress.



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Climate change with its increased droughts, floods and locust invasions, the Covid-19 pandemic, HIV, malaria and other devastating diseases, and the dislocation of poor governance and war, compound these challenges. But the natural exuberance of Africa and their determination to keep striving in the face of all obstacles will see them succeed. To do this they need the tools. Low levels of research and human resource capacity create a bottleneck to Africa reasserting its role in the global economy. Universities in Africa need to change rapidly. They need to recognise the new opportunities and prepare students that are innovative, ethical and adaptable to drive our colleges and schools, build businesses, create new knowledge and serve Africa. They house most of the highly qualified people in Africa and are often neutral spaces where transparent engagement is possible. Universities need to join with society (private sector, farmers, entrepreneurs, civil society and government agencies) to generate new, locally relevant, knowledge that is embedded in ways that facilitate rapid uptake. Universities need to take up their role as a fulcrum upon which Africa makes the rapid strides it needs to take advantage of the African Continental Free Trade Agreement and meet the aspirations of Agenda 2063.

While the impending change holds great promise, the patterns of consumption, production and employment created by it also pose major challenges requiring proactive adaptation by corporations, governments, institutions and individuals. Concurrent to the technological revolution are a set of broader socio-economic, geopolitical, demographic and environmental drivers of change, each interacting in multiple directions and intensifying one another (Brookings, 2020).

## The Challenges for Africa

*“Despite the continent’s promise obstacles to success linger as job creation still has not caught up with the growing youth labor force, gaps in good and inclusive governance remain, and climate change as well as state fragility, threaten to reverse the hard-fought-for gains of recent decades”* Brahim S. Coulibaly (Brookings 2020). This was before the Covid pandemic which has since caused global devastation to lives, health and economies, especially in Africa. The disruptions continue to be felt with pressure on health facilities, loss of learning time and the economic stress of lockdowns with disrupted markets, international transport problems, decreased demand and the severe disruptions to tourism and remittances.

A challenge throughout Africa is the misalignment of job creation and demographic trends. Export-led manufacturing has not been a key feature of transformation in Africa’s economies and that which exists tends not to be labour intensive. The future is focused on services to absorb the youth and workers moving out of agriculture. This reflects the natural resources, history and geography of the continent and the global marketplace. Governments can play a major role in changing this misalignment; not necessarily directly, but by educating and training, improving the infrastructure, facilitating engagement and providing an enabling environment to enhance a strong knowledge economy. Technological progress is critical to providing mechanisms to improve productivity and livelihoods. Poor infrastructure both physical and digital is a significant constraint on development in Africa. It reduces the flow of information, people, services and goods. Improving information access facilitates improved production, allows for bulking and lower market transaction costs, and enables small farmers to generate economies of scale. New technology can help to overcome some of the aggregation challenges of the past. It can assist to overcome many of the barriers to entry and improve efficiency. But the challenge is the lack of IT skills to take advantage of this technology and poor access to internet and electricity with only 25% of Africans able to access internet (Silver and Johnson, 2018) and just over 40 percent with access to electricity (AfDB, 2017). This is particularly important when assessing the challenge of food security. Throughout Africa the governance and regulatory systems increase the time and risk of investing. Mechanisms for communication and engagement between private sector, government and civil society are limited and the education and research sectors often function in isolation reducing their effectiveness at addressing societal challenges.

Food security is a perennial problem. Africa’s food production, nutrition and well-being are threatened by its increasing reliance on imported foods, often reducing the nutritional value of food consumed, undermining local producers and impacting the foreign exchange reserves of many

countries. This is exacerbated by crop, animal and human pest or disease events such as the Desert Locust swarms and the Covid-19 pandemic. Climate change increases the incidence and scale of these problems. Africa is particularly vulnerable to the adverse effects of climate change - despite contributing the least to global warming. Extreme events will become less predictable and cause more damage to the people and countries least able to mitigate the impacts. In Africa strict lockdown policies may have contributed to containing the disease early on, but they have caused great economic damage with only limited social and economic support mechanisms for those affected. The Covid-19 pandemic has severely affected income generation in the urban informal sectors although the rural recovery has been better (World Bank, 2020). In South Africa GDP was estimated to have contracted by 50% during the lockdown (World Economic Forum, 2020). The World Bank estimated that the decline in global per capita GDP growth would result in increasing those in Africa living under the poverty line of \$2 per day. Without adequate mitigation and adaptation, climate change is expected to force a further 100 million into poverty by 2030 (Brookings, 2020).

An inadequately skilled labour force resulting in poor implementation capacity undermines the human resource capital base, reduces the contribution of Africa to the global knowledge commons and severely restricts its ability to address low productivity and poverty which has been exacerbated by the international crises articulated above. In all low and middle income countries the aspirations of the youth are for high-skilled jobs whereas they are confined to lower-skilled, or no jobs. This is particularly evident in Africa where education levels are much lower (70% complete primary and only 40% complete secondary school and less than 10% of the population are enrolled in tertiary institutions compared to 38% in the rest of the world, UNESCO 2018). There is a strong correlation between education and economic growth and research has shown an even stronger correlation between economic growth and the quality of education (Hanushek and Wossman, 2007). The World Bank estimates returns to investment in tertiary education to be more than 20 percent and yet investment in universities remains low, and has been declining since Covid-19. This means it is especially important to ensure that what funds are available are directed to where the gains for access and quality is greatest. The challenge is how to do this in ways that make graduates relevant to their societies. Approaches that prepare students for the future, that provide them with critical thinking skills, the ability to search for information and the ability to adapt that information and their own goals, cannot be over-emphasised. These students need to be able to be creative and flexible, open and capable of harnessing new technologies to stimulate new ways of adding value and improving efficiencies and productivity. And they need to do this so that they are enhancing and not undermining their natural and social environments.

Opportunities and Innovations

### **The Fourth Industrial Revolution (4IR)**

The fusion of the physical, biological and digital worlds is the hallmark of 4IR and has resulted in technologies that are able to provide opportunities to address the challenges of access, aggregation, physical infrastructure and communication which have severely constrained development in Africa. Cloud computing, 3D printing, drones, the Internet of Things, and advanced wireless technologies are among those innovations that radically change the potential of small farms and firms to compete.

Njuguna Ndungu'u and Landry Signé ask whether Africa will be left behind in this industrial revolution or whether Africa will be able to ensure that we put in place those ingredients essential to success (Brookings, 2020). The arrival of fast internet showed a rapid uptake by those with skills and a direct impact on job creation and employment (Hjort and Poulsen 2019) albeit taken up more by men with higher education levels than the less skilled and women. We need now to broaden inclusion and invest in the development of systems to rapidly spread the benefits. The social distancing requirements of Covid-19 have had one positive impact: to accelerate digital transformation and make investment in the sector more essential and more attractive. Many areas of 4IR technology can be transformational and it is essential for Africa to provide an enabling environment to individuals, businesses and institutions to develop, adopt, and adapt these to local situations. In both education and agriculture new technologies require the right incentives and capabilities to develop and scale them (Ceyla Pazarbasioglu in Fugile et al, 2019) and developing these skills must be inclusive.

With a potential to add up to \$180 billion to Africa's gross domestic product (GDP) by 2025, depending on the usage intensity of digital technologies by businesses, the Internet economy is improving productivity and efficiencies across large swaths of the economy, including agriculture, education, financial services, healthcare, and supply chains (e-Economy Africa, 2020). Harnessing digital technology can assist with information and increase the knowledge and bargaining power of small farmers for access to finance, insurance, inputs, technology, markets and processing which in turn leads to a virtuous cycle to improve agricultural productivity and rural incomes.

Access to cell-phones and greater connectivity meant that early improvements in Africa's ICT sector were driven by expanding mobile digital financial services. Africa spearheaded global mobile money and had almost half the existing mobile money accounts in 2018. The COVID-19 pandemic has further demonstrated that digital start-ups in Africa are able to provide innovative solutions when they are needed most. Rural populations also benefit from these initiatives and the Internet economy is critical to reaching and supporting the continent's 1.3 billion people. The potential to enhance the sharing economy (involving short-term, peer-to-peer transactions) provides for more vibrant communities "that do not need lumpy "grid" infrastructure". The gig economy provides opportunities across the world, but only if we are able to compete globally. However, all this requires aggressive investment in human capital (Somik Lal, 2021).

### **Growing back green by strengthening capacity for sustainable food systems**

*"New business opportunities in sustainable food and land use systems could deliver \$320 billion each year by 2030 across sub-Saharan Africa. These opportunities include \$120 billion in forest ecosystem services and restoration of degraded land, \$100 billion in increased agricultural yields and \$100 billion in supply chain efficiency improvements and enhanced value-adding capacity"* (Food and Land Use Coalition, 2019). Building the new climate smart economy requires action across the economy as well as delivery on both grid-based and decentralised, renewable energy investments. Africa has initiated companies that have increased both physical and more affordable access to energy (e.g. Juabar, Lumos, M-Kopa, Tembo). Africa has extensive solar, wind and geothermal resources and has a comparative

advantage in renewable energy. It is also increasingly possible to use new technology to support individual household electrification in remote rural settings.

This has far reaching effects for the delivery of education, health, extension and the potential for agglomeration, clustering, aggregation, pooling and sharing. It changes the economic geography of Africa. To be able to take advantage of this potential it is imperative for higher education to build the systems needed to develop the capacity to use, adapt and implement. Africa needs the teachers, scientists, entrepreneurs and facilitators that can use this new technology. Graduates who are able to continually learn and adapt with a rapidly changing world and who can search for and find the information and tools they need.

### **The way forward for education in Africa**

For multiple generations, higher education has successfully supported growth, economic development, and social change. While society is facing serious disruption, the challenges also come with the opportunity for institutions and their leaders to find new ways to deliver more value to students and society (Robertson, 2021). It is not possible to wait for the next generation to be better prepared. It is going to be necessary to develop multi-sector skilling partnerships and establish collaborative models in education similar to those that have been successful in driving the emerging 4IR technologies.

Africa needs to increase agricultural innovation to support its food systems and adapt to climate change. This can only be done by facilitating access to the information and inputs needed and investing in the capacity to implement. Universities are uniquely placed to be able to provide a platform that brings together stakeholders from the government, corporate, community and small enterprise sector to carry out this research while at the same time building capacity at all levels in the field, at colleges and universities. South Korea provides one example of how government has facilitated these platforms. RUFORUM projects and programmes have shown that it is possible. These and similar initiatives need to be rolled out across the continent.

Repurposing the current public support for agriculture offers a significant opportunity to revitalize public agricultural research systems, invest in agricultural higher education, and create the enabling conditions to leverage private sector R&D. The private sector, in turn, can stimulate more rapid access to new technologies for farmers. Corporations could be encouraged to work on innovation platforms with universities, where much of Africa's highly skilled people can be found. Universities provide opportunities for addressing both research and human skills constraints by supporting students to work with communities, the private sector and government. This will also strengthen research and tertiary education institutions. *"Agriculture in Africa and South Asia faces an innovation paradox. While the economic returns to and growth effects of R&D and knowledge diffusion are documented to be very high, research spending is decreasing in critical areas of the world and (especially in) local universities and think tanks are not keeping up. Policy makers in developing countries need to give careful attention to reversing these trends and improving the broader enabling environment to encourage private sector contribution as well,"* William Maloney. Africa must embrace the benefits that new technologies offer making it possible to change the economic geography of service delivery and education. These

disruptive technologies present opportunities for improving growth and equity but if they are accompanied by a shortage of skills and knowledge, they could result in mass unemployment and growing inequity. These benefits also open up a range of possibilities for financing higher education through scaling out courses, facilitating partnerships, stimulating joint research and services to the private sector, government and civil society agencies and creating vehicles to strengthen climate-smart agriculture and reach more communities supporting innovation, sustainability and inclusion.

African Internet opportunity is driven by the talent of young digital entrepreneurs. Startups are solving some of Africa's most challenging issues, such as access to healthcare for remote populations, employment opportunities for women, and the ability to securely send and receive money. Advanced technologies—tailored to data-driven, scalable, and pan-African approaches—are providing new ways for Africans to conduct business and earn income. A robust collaboration between the private and public sectors is imperative to ensuring that African entrepreneurs succeed, not only in their home countries and regions, but in the global marketplace. Startups, and the entrepreneurs who create them, are the future of the continent (Google and IFC e-Economy Africa 2020 Report). Universities need to lead the way.

The speed of technological innovation and industry demands are moving faster than higher education's ability to adapt. Graduates will not be able to cope with the rapidly changing world while universities are using outdated approaches. They need to focus more on interpersonal and problem-solving skills, the ability to learn, adapt, obtain information and self-initiate. Critical thinking, teamwork, creativity and an entrepreneurial outlook need to be cultivated. These all imply far more emphasis in how we engage with students and less focus on what is taught. This has been known for some time, 4IR makes it possible for us to put this in place radically different approaches. The COVID-19 pandemic shocked the universities into adopting new technology to reach students. This now needs to be incorporated in ways that provide lecturers more opportunity to facilitate learning rather than creating and dictating course content thus improving the quality of higher education. E-Learning is far more than providing access to information and investments need to be made to ensure that new blended learning systems are effective, are able to continuously adapt, and use new technology to best effect.

Universities need to establish mechanisms to engage with the private sector, government and civil society in both developing and financing appropriate research, learning and outreach programmes.<sup>1</sup>

The strategic role of RUFORUM in catalysing change to achieve the African Agenda 2063  
As a network of universities across Africa, the Regional Universities Forum for Capacity Building in Africa (RUFORUM) has a convening, sharing and advocacy platform that regularly brings together multi-agency, multi-sectoral and multi-disciplinary actors. The foundation of this network is to share findings, share resources and work collaboratively with each other and across society to improve

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<sup>1</sup> EdTech Hub promotes and interesting adaptation of the triple helix approach that uses a single connected ecosystem that reaches & reports to multiple internal & external audiences, available on computer, mobile and off-line for true collaborative learning and research (Robertson 2021)



smallholder agriculture, rural incomes, gender equity, and food and nutrition security. In the field this is reflected in the research projects, scholarships and post-doctoral fellowships supported. At national level it is evident in the National Forums and dialogues supported and at regional level RUFORUM brings together universities, governments together with regional and sub-regional research, education and governance bodies. It has also initiated and promoted regional doctoral programmes and facilitated African mobility of staff and students. Their contribution to inclusive African capacity building is also reflected in the high retention and quality of graduates and the sharing of resources across institutions.

These initiatives need to be scaled up. The demand to join the network needs to be managed. The expectations of members of the network need to be met, within resource limitations. The primary value to the members is the opportunity to share information and resources and build relationships across Africa. In the past this has been done primarily by face-to-face meetings to develop collaborative projects and programmes. As a result of Covid-19 partnerships are increasingly being forged digitally. There is still the need to meet and engage directly is also important to generate new connections and to deepen relationships while digital connectivity allows the collaboration to continue between meetings.

4IR and internet make sharing, harmonisation and collaboration more possible. This means that RUFORUM needs to facilitate opportunities for joint courses, for collaborative research and for skills training using digital technologies. It needs to lead the way. This digitisation also makes it easier to include women. The new rapidly changing world is likely to move increasingly to short courses taken asynchronously over the internet with flexibility in the length of time for obtaining qualifications. This is likely to make it easier for women to further their studies even during their child-bearing years. For example, modules available on line will make it more possible for women to register for regional doctoral programmes as it will limit their time away from home. Entrepreneurs will be able to space their studies to allow them the time to run their businesses and companies will be able to ensure that their employees remain current by offering them short certified courses to advance their qualifications and careers. Universities can more easily share common course content access on line and only facilitate and assess the coursework in their own institutions. They can also share resources for developing curricula and even for mentoring and facilitating highly specialised courses. RUFORUM is in a good position to support and facilitate this collaboration between member universities and the transition to adopting new technology.

RUFORUM is also well positioned to scale out several of its models that have led the way in establishing local platforms of engagement between tertiary institutions, their students and staff and target communities as well as the service agencies and entrepreneurs involved in those value chains and innovation hubs. It is also important to deepen their achievements in strengthening national platforms and in positioning their member universities to support evidence-based policy. One area that RUFORUM intends to strengthen going forward is more collaboration between universities and the corporate and multinational sectors. These companies would be able to further their ESG goals by investing in relevant research and capacity building initiatives.





During the Covid-19 pandemic RUFORUM was instrumental in showcasing the importance of capacity development in Africa and led the way in connecting stakeholders to develop and advocate for African strategies to address emerging issues. They have been innovative in reaching out to form new partnerships for strengthening tertiary education in Africa. They now need to find ways to generate operational resources from the services they provide. The energy that is continually being diverted towards financial support for networking, advocacy and secretariat costs could be more effectively directed at developing new programmes and partnerships that deliver on generating and sharing knowledge and graduating effective, ethical change agents.

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This is our fourth issue in a series of articles we are releasing as part of the RUFORUM Seventh Africa Higher Education Week and RUFORUM Triennial Conference Digests. More information about the conference is available at <https://www.ruforum.org/Triennial2021/>. Join the Conversation on Social Media using our Official hashtag #AfricaHEWeek2021







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