

# Up to date infrastructure prerequisite to harness new technologies



IMF resident representative to Zimbabwe Patrick Imam

The International Monetary Fund (IMF) says advances in technology are already shaking up the landscape for jobs in many regions around the world. But with its rapidly growing population, sub-Saharan Africa stands to be particularly impacted by the wave of technological innovation known as the Fourth Industrial Revolution. IMF resident representative to Zimbabwe Patrick Imam (PI) tells *Business Times* (BT) how the 4th Industrial Revolution will have an impact on the job market in Sub-Saharan Africa. Find excerpts below:

**BT: What is the 4th Industrial Revolution, and what are the key messages from the analysis of the future of work for Africa?**

**PI:** The 4th Industrial Revolution refers to the technological advances we have seen in recent years in sectors ranging from artificial intelligence, 3-dimensional printing, autonomous driving nanotechnology and biotechnology, energy storage or quantum computing. It represents a fusion of technologies that is blurring the lines between the physical and digital spheres. The key message is that the future of work has already begun, with the 4th Industrial Revolution redefining how and where goods are produced.

And there are both opportunities and threats that arise from new technologies for the African continent. On the one hand, technological advances are providing a unique opportunity for Africa to create new growth sectors, including in services, and to leap-frog outdated or more expensive technologies and infrastructure. Think about India's success in outsourcing industries or how Africa could avoid investing in fixed landlines and switch straight to mobile phones.

At the same time, there is a risk that new technologies will substitute for workers, increasing unemployment

and inequality. For sub-Saharan Africa, a concern for instance is that automation can lead to reshoring of production to advanced economies, such as what is happening on a small scale with shoe production.

This makes the traditional manufacturing-led growth model that was so successful in Asia potentially a less viable industrialisation strategy. The policy choices made today can facilitate the adjustment of economies and create an environment that helps harness the new opportunities being created.

This requires an openness to adapt development strategies to the demands of the 4th Industrial Revolution. Integration to the world economy and connectivity will be key pillars of successful growth policies. This includes investing in traditional and digital infrastructure, and an education system that keeps pace with changing skill requirements for instance.

**BT: Why is the 4th Industrial Revolution relevant for SSA, after the first three largely bypassed it?**

**PI:** While technological change has historically yielded significant gains that improved living standards, this has mainly benefitted currently developed countries. You are right to say that sub-Saharan Africa largely missed out on the earlier industrial revolutions. Industrialised countries, and more recently the Asian Tigers economies benefitted from the previous industrial revolution because they managed among other things to invest in education and had the right institutions in place, which was not the case for Africa. This time, things may be slightly different, as one can argue that in Africa, we are in some ways at the forefront of technological adoption.

Already, we see many examples of new technologies being used to leapfrog. Mobile phones have been adopted immediately, leapfrogging the need for a costly fixed line network. In some countries,

like Rwanda, drones are used to deliver medical supplies in faraway places, overcoming limited road infrastructure and remoteness. Mobile banking, particularly in East Africa, has opened-up financial services to those that previously had no access to traditional banks.

Electronic cash, as pioneered in Zimbabwe is another successful example of sub-Saharan Africa being in the front line of adoption. And these new technological advances offer many opportunities for sub-Saharan Africa to raise inclusive growth and progress towards the Sustainable Development Goals.

However, we should not fall for the technological fundamentalism, and think that it will solve all of Africa's problems. The basics for development, such as investing in the education and health of children, and having up-to-date infrastructure or strong institutions in place, are pre-requisites to successfully harness new technologies and to create employment. These challenges cannot be overcome by technology. An illiterate workforce cannot adopt new technologies for instance.

Nonetheless, the policy challenge is to support the new and emerging sectors that drive growth and create employment. If successful, we think that sub-Saharan Africa can create much of the required 20 million good-quality jobs per year for its young and growing population and make progress towards meeting the Sustainable Development Goals.

I would emphasise though, that the 4th Industrial Revolution is unlikely to have the same impact on sub-Saharan Africa than it does in advanced economies or emerging markets. Low wages and widespread underemployment mean that there is less of a need to automate than in advanced economies with shrinking populations.

If automation leads to a major reshoring of production to advanced economies, or limited job creation in

## 2040

Sub-Saharan Africa with a population that is projected to increase from about 900 million today to 1.7 billion constitutes a sizeable domestic market.

## The Q&A

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If countries reduce trade barriers, this market can provide scale for local firms and should encourage more foreign direct investment.

However, the problem of intra-African trade is not simply one of trade taxes. I would argue that physical distances and socio-economic differences, including language and colonial history, constitute barriers to trade that seem more important than in other regions, and that also need to be overcome as well.

Very often, two Anglo-phone countries far apart trade more than a Francophone and Anglophone neighbour. These invisible barriers to trade have to be overcome as well. But if the CFTA can create sufficient momentum and is accompanied by investments in regional infrastructure, this will already be a huge step in overcoming barriers.

**BT: Why should SSA countries invest more in secondary education? Doesn't the 4th industrial revolution reduce the returns to education?**

**PI:** Let me answer your question in the following way. There is considerable uncertainty over the specific skills that will be needed in the future. Had you asked experts in the 19th century what jobs would be needed for the 21st century, no one would have been able to come up with jobs like a psychologist or computer programmer. And I would argue we are in a similar position today, with the rapid technological changes, one simply cannot accurately predict what jobs will appear in a generation.

However, whether technology becomes a substitute or a complement to labour is not necessarily a force beyond our control. Turning the question around, we should ask what skills will be complementary to technology, what skills are needed to develop or use technology.

This puts a high premium on education to empower the youth to succeed in the changing world of work. Digital literacy, adaptability and lifelong learning will likely be skills for success, and secondary education will become even more important in that context.

Sub-Saharan Africa has made important gains in increasing primary completion rates but has not kept up with other regions on secondary education. Secondary enrolment rates, a more forward-looking indicator of likely education outcomes for the next generation, remain well below other regions. Education of women in particular needs to improve as well. History has taught us that the best investment a country can do is by investing in young girls and women.

The education systems will also need to be flexible to adapt to changing labour market requirements, to help workers acquire the right skills. Also bear in mind that technology can help strengthen the delivery of education, not least through online material. Educational systems will also need to allow for life-long learning, while ensuring full enrolment and introducing technology in every classroom. The bottom line is that a high-quality secondary education is likely to be

a key driver of development for the 4th Industrial Revolution in Africa.

**BT: Why is it important for SSA countries to invest in digital infrastructure?**

**PI:** Improving living standards for all, including the most vulnerable groups will require economic dynamism and related job creation, which in turn will require connectivity. Connectivity goes beyond the need for traditional physical infrastructure of roads, railways and ports which is currently the focus of most country investment plans.

Experience within the region demonstrates that if there is adequate digital infrastructure and a supportive business environment, new forms of business spring up and increase the efficiency of existing sectors, particularly services which is a growing share of economies.

In Madagascar for instance, there is a thriving call centre for the francophone world that has developed over the past years, thanks to strong digital infrastructure. Expanding access to digital infrastructure will ensure that the benefits of technology are shared widely, including by the most vulnerable groups. Innovative technologies are being used across Africa to improve living standards and lead to the creation of new businesses.

Smartphones provide advice on agriculture, including on identification and treatment of pests. Drones deliver critical medical supplies to health centers in rural areas. Mobile money provides access to financial services to millions who were previously excluded.

Today, internet penetration in sub-Saharan Africa is the lowest in the world. It is less than half the global average, although a few countries like Kenya, Nigeria, and Seychelles have made substantial progress and have penetration levels of close to 50 percent, which is slightly above world average.

The cost of a fixed broadband connection is highest in sub-Saharan Africa compared to other regions. Only for mobile broadband are costs comparable to other regions in US dollar terms. However, once you scale the costs by gross national income, sub-Saharan Africa has the least affordable mobile broadband. Therefore, more investment in the digital infrastructure is likely to be very beneficial for economic development in Africa, particularly for the poor.