

# Accelerating catch-up

## Tertiary education for growth in Sub-Saharan Africa



### Introduction

Following more than two decades of economic stagnation, GDP growth in Sub-Saharan Africa (SSA) accelerated to over 6.0 per cent during 2002–07. This remarkable economic turnaround is the result of increasing macro-economic stability; reforms that have whittled away market imperfections and reduced trade barriers; greater foreign direct investment; and, most consequentially, rapidly increasing global demand for the natural resource-based commodities exported by sub-Saharan countries and increased investment in mines, oilfields and the supporting infrastructure. The growth surge abruptly slowed in late 2008 because of the deep global recession; and the forecast for real growth in the Sub-Saharan Africa region for 2009 has been revised downward from 4.2 to 2.5 per cent.<sup>1</sup> The tentative forecast for 2010 calls for a revival of growth to 4.3 per cent, but this will depend upon a recovery of the global economy and trade, both of which are growing at rates not seen since the Second World War.

While international trade grew by more than 10 per cent during the past decade, its growth is expected to be about half that in the near future.<sup>2</sup> This will intensify the competitive pressure on Africa's traditional exports of light manufactured goods and processed foodstuffs, and further limit the growth impetus that African economies can derive from this source.

### A knowledge-intensive growth strategy

In the light of these circumstances, countries in SSA must redouble their efforts to augment those capabilities that will enable them to diversify into new tradeable activities, generating higher value-added and significant knowledge spillovers. Moreover, such diversification will need to be buttressed by sustained efforts to improve the institutional correlates of the business climate; to ease the infrastructure constraints which have undermined Africa's export competitiveness; and, most importantly, to increase the supply of high-level technical, professional and scientific skills. For many of the economies in the region, such human capital is a necessary stepping stone to gaining competitive systems that could underpin long-term growth.

Physical investment and institutions are important complements. Physical investment cannot be efficiently utilised or maintained where technical and managerial skills are in short supply; and institutions cannot be customised for local needs or implemented when human capital is desperately scarce and of questionable quality. The urgency of moving up the technological ladder is not

the only reason why human capital is becoming central to SSA's growth strategy. Human capital, effectively harnessed, would enable African economies to increase the allocative efficiency of, and maximise the returns from, (initially) limited supplies of physical capital. Moreover, it is only through the application of knowledge that African countries will be able to cope with potentially crippling threats from prevalent diseases, find employment for expanding youthful and urbanising populations, and respond to the threats posed by impending climate change.

Africa's stock of human capital with secondary- and tertiary-level skills is comparatively small, and its quality is highly variable. The accumulation of skills in some countries is dampened by mortality arising from infectious diseases and by the emigration of many of the most talented. Only by raising the rate of investment in human capital can the region reach and sustain the level of economic performance it needs to achieve various Millennium Development Goal (MDG) targets which the World Bank, other donors and the global community at large view as necessary objectives; and to narrow the economic gap between SSA and other developing regions. Reflecting this, the World Bank's lending to higher education has increased dramatically since 2000.

Based on the above, the report *Accelerating Catch-up*<sup>3</sup> seeks to inform discussion on pathways to development and on policy, as African countries consider the types of innovations needed to build tertiary education systems equal to the technological imperatives and global economic challenges these countries are and will be facing.

A more knowledge-intensive approach to development is arguably the only route that could allow many late-starting African countries to achieve sustained, outward-oriented development in more contested and slow-growing markets for tradeable goods. Even though social and political demands press for expansion of enrolment at public tertiary institutions, these must be balanced against the need to raise the relevance of education, and of research, and to target the production of those technical skills and areas of applied research that will be in demand from a new and more dynamic crop of industries. Too rapid an increase in total enrolments and enrolment in disciplines for which demand is weak, as has happened in the recent past, has eroded quality and is undermining the contribution that tertiary education can make to growth.

Thus, the inability to manage the expansion of enrolments in traditional public sector tertiary institutions – the main providers of science and technology training – in ways that preserve educational

quality while ensuring sustainable financing is a major obstacle for nations seeking to derive greater economic leverage from knowledge. Finding a way around this obstacle may require innovative approaches to mobilising private universities, technical institutes, non-resident community colleges, and distance learning programmes to offer financially viable avenues for continued enrolment expansion; while public institutions go through a period of consolidation that concentrates on boosting quality, re-invigorating research, and solidifying graduate programmes. In the long run, traditional delivery systems for tertiary education based on residential campuses and face-to-face teaching may need to be supplemented by, or transformed into, different delivery models if a sustainable expansion of post-secondary enrolments is to continue.

## Why tertiary education and its quality matter for growth

A wealth of recent research has convincingly established the relationship between on the one hand, the accumulation of physical capital and total factor productivity (a commonly used measure for knowledge capabilities) and on the other, growth. Physical capital contributes directly to growth through embodied technological change that enhances productivity. Because technological change is increasingly skill biased, human capital complements the creation of productive capacity. Human capital affects growth through multiple channels: by increasing allocative efficiency and the efficiency with which assets are managed, utilised and maintained; by promoting technology assimilation; through entrepreneurship, which leads to the start-up of firms; and through innovation, which raises productivity, unlocks new investment opportunities and enhances export competitiveness. The spread of information and communication technology (ICT) – widely viewed as a leapfrog technology that could widen industrial opportunities, farming productivity and labour market efficiency<sup>4</sup> – is adding to the demand for skills and, in particular, for higher quality skills.

A more skill-intensive route to development could provide both resource-rich and resource-poor African countries with avenues for raising domestic value-added – and for multiplying opportunities for innovation and diversification away from traditional commodities that are subject to wide price swings. The mitigation of, and adjustments necessitated by, climate change also calls for the innovative application of existing technologies and the development of new technologies that are suitable for the African context.

Innovation in the African context might turn out to be of a different nature to that of the industrial innovation practised in East Asian countries. In Africa, innovation may well arise most fruitfully from efforts focused at problem-solving under conditions of scarcity, which is attuned to local requirements, the composition of economic activities, and factor availabilities.<sup>5</sup> Innovation would be more 'idiosyncratic' and involve, for example, redesigning devices imported from abroad and customising them for indigenous needs and production capabilities. It could lead to a re-engineering of services so as to make them better suited to the African context and the expectations of African users. Such innovation, practised on a broad enough scale, could draw upon grass-root energies to

catalyse an innovation system and complement top-down efforts to build one. Grass-roots innovation may thrive with the help of prizes; contests; widely publicised recognition of innovators; and a campaign that seeks to popularise science, make it meaningful and accessible to the public at large and spark a culture of creativity.

Thus there are at least four reasons for prioritising educational quality over quantity at the higher levels of education.

- Quality is more closely correlated with individual learning outcomes and growth.<sup>6</sup>
- Workers with higher quality cognitive, as well as technical, communication and team skills, are better able to assimilate technology, to push the knowledge frontier and to innovate in a variety of areas, to work in groups, to improve their decision-making skills and to build the requisite technological capability for competitiveness. And all of these form the basis for applied research in fields such as engineering and the biosciences. Such capacity would enable SSA to make the transition to a higher growth trajectory, one that facilitates progress toward MDGs in poverty reduction, food security, education and health.
- Tertiary institutions that are equipped to impart quality education and conduct relevant applied research are also more likely to cultivate multiple linkages with industry and to stimulate knowledge-based development through a variety of proven channels.
- Better quality education that is attuned to the demand of employers can lead to lower graduate unemployment and enable graduates to effectively participate in lifelong learning.

## Growth options, the constraints and ways of removing them

A slower growing and harsher global trading environment, the rapid pace of technological change and the untapped scope for innovation, require African countries to choose from among the following options:

**Traditional markets:** Intensifying their efforts to make a success of the traditional model of development by enlarging their extremely small share of the international markets for standardised manufacturing industries and agro-industrial products, where the value-added for the producer can be small, competition intense, and survival dependent on fully exploiting the lower costs of land, labour, utilities and a more relaxed regime of environmental regulations; while at the same time becoming a part of global value chains.

**Less hotly contested niche markets:** Diversifying into less hotly contested niche markets (which are likely to be small) for low- and medium-tech manufactured goods or agricultural products, searching out untapped technological possibilities, and innovating in the hope of entering new markets such as biofuels.

**Tradeable services:** Gaining a foothold in the markets for tradeable services and, in particular, IT and IT-enabled services (IT/ITES) by using technical and language skills and time-zone advantages.

**Processing mineral resources:** Moving up the value chain for natural resources by processing more of these resources domestically,

and exploiting backward linkages by building engineering or input-supplying industries for the mineral resource extraction sector.

**Selected subsectors:** Making a more intensive, regionally co-ordinated effort to assimilate available knowledge in selected subsectors through investments in a few high return, high risk ventures with gestation lags of intermediate length.

**Managing natural resources:** Carefully managing natural resources so as to maximise the returns and contain the environmental spillovers.

For the SSA region, the urgency of shifting tracks to a different growth path is rendered more acute by:

- Impending climate change because its implications for water availability in the interior of the continent, for agriculture and for the tourist sector, will be profound
- Pressures generated by AIDS and other recalcitrant infectious diseases that affect dependency ratios, fertility, labour productivity, primary enrolment, school attendance, the number of orphans, nutrition during early childhood, and many other variables
- Tensions arising from the growth of the population and the labour force, and migration to the cities which might be slow to generate enough jobs to absorb the 'youth bulge'
- Economic vulnerabilities and acute social pressures created by an unequal distribution of incomes and the likelihood of widening inequality
- Lags in exploiting new farming technologies, because of historically low investment in R&D, which have constrained productivity and increased vulnerability of current varieties to pests and weather extremes
- Problems with planning and implementing projects, and with regulating and maintaining the existing physical infrastructure
- Brain drain and the losses inflicted by the high mortality of the educated because of AIDS, which has worsened the shortage of skills
- An underdeveloped institutional infrastructure (and the slow progress of many countries to strengthen key legal and market institutions), which is responsible for the unfavourable business climate, technological backwardness, failing tertiary institutions, and chronic social unrest in some countries
- Vulnerabilities arising from exposure to external shocks.

Higher rates of growth will depend in the medium term upon gains in the efficiency of resource use and also on total factor productivity derived from advances in technology. Accelerating growth, viewed from the perspective of supply, requires:

- Sharp gains in allocative efficiency, mediated by public agencies, the financial system and the business sector
- A significant increase in the efficiency with which capital assets (infrastructure and industrial) are utilised, and systematic efforts to maintain these assets
- A steady improvement in the capacity to search for and assimilate relevant technology and incorporate incremental

advances, to encourage grass-roots innovation, and to harness technology for a variety of purposes – not least, producing tradeables, improving public health, and conserving energy and water

- An accumulation and deepening of managerial and organisational skills and experience, to support industrialisation, maximise the gains from IT, and improve international economic relations, as well as to benefit from the trends toward decentralisation and urbanisation.

All these are reliant on an increase in the ratio of skilled and technical workers to capital, at a relatively early stage of development. Trained workers and professionals not only provide technical knowledge and promote innovation, they also serve as allocators of resources, and as co-ordinators and equilibrators who can perceive and exploit technological possibilities. Where resources are invested, the assessment of risks, technologies employed, organisation of production, upgrading and maintenance of assets, investment in R&D, incentive to innovate, and the commercialisation of new technologies, all depend on choices made by decision-makers operating in public and private capacities. The quality of these myriad decisions is as significant for the eventual outcomes as the direct input of human capital in the production process. These allocative and risk-managing functions – making multiple trade-offs, and communicating and co-operating with many different parties to improve the quality of decisions – are vital complements to the activity of innovation. Together they help enlarge the contribution of knowledge to economic performance.

For all these pressing reasons, and the urgent need to accelerate catch-up, SSA must give priority to tertiary education.

#### Endnotes

- 1 World Bank (2009). *Global Economic Perspective*. March 2009 Update.
- 2 Economist Intelligence Unit (April 2009). *Global Outlook*.
- 3 World Bank (2008). *Accelerating Catch-up: Tertiary Education for Growth in SSA*.
- 4 See World Bank (2009). *Information and Communications for Development 2009: Extending Reach and Increasing Impact*. Washington, DC: World Bank.
- 5 See Srinivas, S. and Sutz, J. (2008). Developing countries and innovation: Searching for a new analytical approach. *Technology in Society*, 30(2), pp.129-40.
- 6 Hanushek, E. A. and Woessmann, L. (2007). The role of education quality in economic growth. *World Bank Policy Research Working Paper 4122*. Washington, DC: World Bank.

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