

AFRICA 2050

Attaining the 2050 Vision for Africa:
Breaking the Human Capital Barrier



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Attaining the 2050 Vision for Africa: Breaking the Human Capital Barrier

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This paper discusses the imperative of a major scaling up of human capital in Africa as a prerequisite for economic transformation. It highlights the opportunities and challenges that African countries face in making what would amount to a quantum leap in raising levels of human capital and outlines some promising approaches towards achieving that objective.

Vision: By 2050 African countries will have developed the human capital—through national, regional and global cooperation in education, health, science and technology—needed to foster rapid, inclusive and job-creating growth, cohesive societies and accountable governments as a basis for catalyzing and supporting sustainable convergence in living standards between African countries and the rest of the world.

Introduction and Overview

This paper discusses the imperative of a major scaling up of human capital in Africa as a prerequisite for economic transformation. It highlights the opportunities and challenges that African countries face in making what would for most countries amount to a quantum leap in raising levels of human capital and outlines some promising approaches towards achieving that objective. Over the next decade, African countries must lay the foundations for unleashing the full human potential of their people to enable them to lead healthy and productive lives. To achieve this is crucial to accelerating the economic transition from low to higher productivity sectors and enhancing Africa's competitiveness in the global, knowledge-based economy.

While the issues covered in the paper have pan-African relevance, most of the discussion focuses on sub-Saharan Africa (SSA). The report is divided into five sections: (i) Introduction and Overview, (ii) Building critical human capital foundations; (iii) The articulation between post-basic education, labor and the market, (iv) Mobilizing sustainable education financing; and (v) Primary health care. The last section is limited to focus on the importance of lowering the disease burden in order to raise the quality of life and improve the productivity of the labor force.

By 2050 Africa would be home to 2 billion people with a per capita income of US\$17,500 and a skilled and productive workforce. Basic education would be universal and free for the first nine years and enrollment would have exceeded 80 percent at the senior secondary level and 35 percent in higher education. African universities would have become leading global research centers of excellence in fields such as extractive industries, agribusiness and biotechnology. Africans would be healthier and living longer as a result of better nutrition and health care, higher incomes and drastically reduced poverty, underpinned by a well-educated consumer middle class.

To achieve this vision we have suggested a set of targets that would need to be met by 2050. They include a doubling of the completion rate for an 8-9 year basic education cycle, a 5 fold expansion in enrollments at the tertiary and pre-school level, and close to a three-fold increase in enrollment at the upper secondary level. In percentage terms, the proposed annual growth rates are not as high as those that African countries registered in the recent past. During the period 1970-2010, there was more than a twenty fold expansion of tertiary education, a twelve fold increase in enrollment in secondary schools and primary enrollment increased by about 350 percent. However, achieving the 2050 targets will require more effort because education systems are larger and becoming increasingly more complex and because reaching the children not yet enrolled will often be more difficult and costly.

While most education indicators in SSA will continue to be below those of other regions, expanding education to the proposed levels will provide the labor force with sufficient skills and capacity to support economic transformation in the continent. China has become an economic powerhouse with education indicators that are no higher than those proposed here: In 2009, China's enrollment ratio in tertiary education was 24 percent (up from 3 percent in the early 1980s) and below 70 percent in upper secondary education with only 20 percent coverage in the rural areas (World Bank 2013). Improvements in education coverage, however, must go hand in hand with a major improvement in education quality.

Achieving the 2050 vision for human capital development in Africa is important and urgent. Much of the economic growth registered in the last decade has been enabled by improved macro-economic policies, greater political stability, improved business climate and growing global interest in Africa, primarily driven by commodities. While these are important drivers for jump-starting economic growth, they are insufficient to sustain or expand it without parallel improvements in key fundamentals of growth, in particular human capital, knowledge and infrastructure.

By raising the quality of human capital, the region would build critical capacities, increase the volume and quality of skills, and deepen the institutional base for harnessing new job, industrial and technological opportunities that will open up as the economies become more globally connected. In addition, a healthier and better educated and trained population will produce more, accelerate the demographic transition and contribute to poverty reduction. If, on the other hand, progress in reducing the disease burden and raising the education and skill levels of the population falters, the large reservoir of young people could become a disruptive force and slow down or reverse economic growth. The window of opportunity to make the massive investment required is no more than 10-15 years after which a weak human capital base would begin to act as a drag on further economic growth.

The rest of this section (i) reviews key factors driving education change until 2050, (ii) highlights the key messages of the discussion in Sections 2-5 about the urgency and options for responding to these drivers; and (iii) suggests elements of a strategic agenda for attaining the 2050 vision.

Key drivers of education change

Education change is driven by a mixture of factors originating from *inside* the education system as well as from national, regional and global developments *outside* the system. Often these two sets of factors are mutually dependent. For example, demography impacts education in many important ways, and education impacts key demographic factors such as fertility, mortality and migration. Similar mutual dependencies exist between education and economic growth, education and technology, and education and globalization. Some of the most important and urgent drivers for accelerating education development in Africa are the persistence of “old” challenges *within* education systems, such as addressing the legacy of low educational attainment levels resulting from low education coverage at independence and the education stagnation during most of the 1980s and 1990s. Others stem from major successes over the last decade, such as the increasing pressure for post-primary education resulting from last decade’s rapid enrollment growth in primary education.

However, compared to the past, future pressure for change *will increasingly come from outside the education system* and be driven by unprecedented economic, demographic, social and technological change that is reshaping national societies, the global economy and interaction among nations. The following **six forces outside the system** will be among the most important drivers of education policy over the next decades. Their relative importance will depend on the country: Africa is a very diverse continent in most respects, including with regard to education development challenges. Some of these drivers require urgent attention over the next decade to build the human capital foundation for attaining the 2050 Africa vision. Others will increase in importance throughout the period up to 2050.

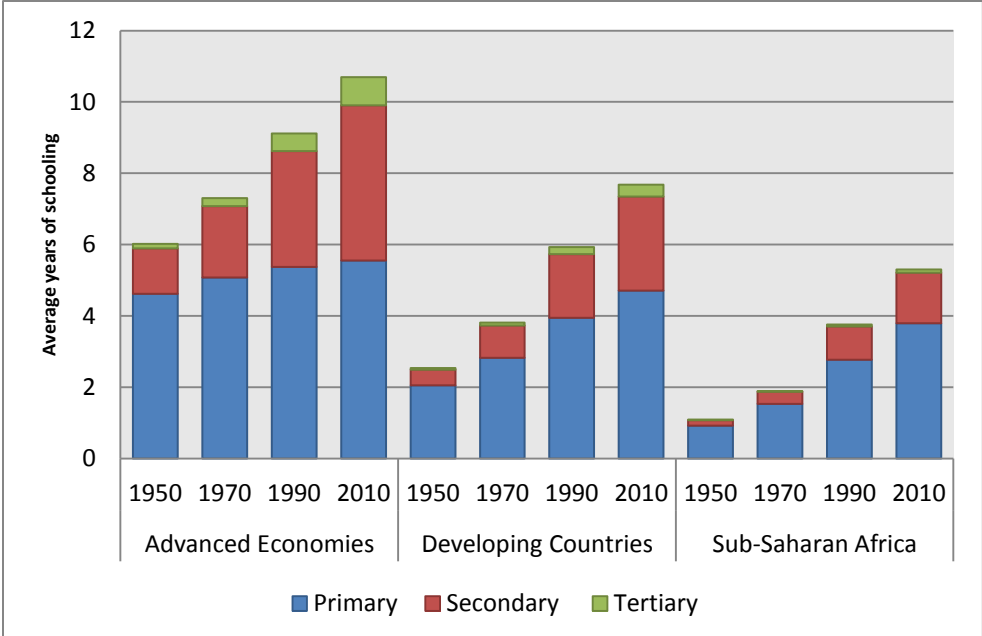
(i) The growing role of human capital: By 2050, the world will have undergone unprecedented change in most areas impacting the human condition. Countries’ ability to manage these change processes, in ways that allow them to seize the opportunities while minimizing risks, will increasingly depend on the quality of their human capital. The importance of human capital is reinforced by the dramatic rise over the last decades of the role knowledge and innovation play in development.

Education’s role in creating human capital is as indispensable as it is multiple. It ranges from enhancing productivity and peoples’ ability to sustain a livelihood, adopt new technologies, and be better parents and citizens to building the awareness, attitudes, skills and partnerships needed to tackle regional and global development challenges. Historically, public policy to advance basic literacy and numeracy has done more to advance human conditions than perhaps any other single policy. These are not only core competencies but are also prerequisites for most forms and levels of lifelong learning. **To lay this foundation is a development stage that cannot be “leapfrogged.”** Thus, there is a real urgency for the countries that have not yet built this foundation to accelerate the provision of basic education to all.

Countries at all income levels are retooling their education systems to better address their evolving human capital needs. Because African countries start from very low initial levels, the challenge is particularly daunting for them. Figure 1 shows that SSA’s level of educational attainment of adults — a proxy for a country’s level of human capital — was in 2010 where the

advanced economies were in 1950. And SSA’s low average hides wide variations across the continent: Less than half of the adult population had completed primary education in 11 out of the 15 countries for which data were available. In five countries, only one in ten adults had completed lower secondary education, and the share of adults having completed upper secondary level ranged from 0.5 to 44 percent. In only one country had more than 3 percent of the adults completed tertiary education.

Figure 1: Average years of schooling by education level, 1950-2010 (population 15+ years)



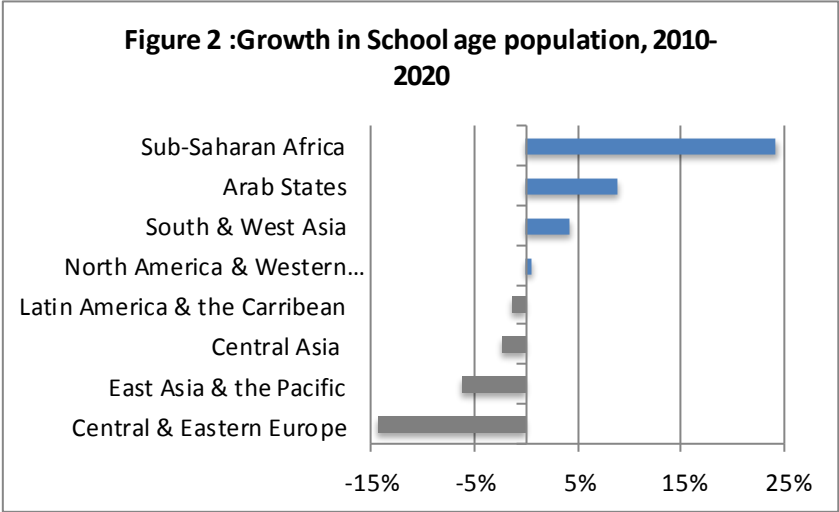
Source: Barro and Lee 2010

Barro and Lee (2010) use information on educational attainment for 146 countries for the period 1950-2010 to estimate the relationship between education and output. The key finding is that schooling has a significantly positive effect on output with estimated rates of return for an additional year of schooling ranging from 5 to 12 percent. The rates were higher at the secondary and tertiary levels than in primary education. More importantly, the data demonstrate the symbiotic relationship between education and economic growth – the two expanded in tandem during that 60 year period.

SSA’s educational attainment will improve as the large number of students who entered school during the last decade progress up the education system and into adulthood. However, *sustaining this improvement requires continued bold corrective measures*. SSA’s coverage of pre-primary education — a critical pillar of human development — was only 17 percent in 2010 against 48 percent in South Asia, 57 percent in East Asia and 70 percent in Latin America. Similarly, the number of primary school children who are out-of-school (31 million in 2010) in SSA has started to increase again; the region now accounts for 51 percent of the world’s total. The illiteracy rate for the age group 15-24 years is 28 percent and risks stagnating at a high level

in the absence of second-chance programs and reduction in early dropout (30 percent drop out prior to Grade 5). This would have huge negative impacts in areas such as labor productivity, family welfare, women’s empowerment and speed of the demographic transition.

(ii) Africa’s slow demographic transition: This factor will profoundly impact education over the next decades, significantly adding to the challenge of catching up on human capital formation. SSA countries will need to continue to expand massively their school systems just to cater to population growth while other developing regions can start shifting resources to expanding post-basic education and to quality improvements at all levels. Africa’s population aged 5-14 is projected to increase by 71 percent (181 million) between 2010 and 2050, with an 83 percent increase for SSA but only 6 percent for North Africa. The increase will be especially rapid during the current decade (Figure 2). As a result, Africa has the world’s most youthful labor force and this youth “bulge” creates tremendous pressure on skills development and employment creation. For example, to keep the ratio of employment to working-age population constant, between 2005 and 2020, the number of jobs in SSA would need to increase by about 50 percent, which translates into employment growth of 2.7 percent a year (World Bank 2012a). At the same time, if countries succeed in providing good quality education and health care and generating sufficient employment, the youth bulge could become a major demographic dividend by progressively adding cohorts of young people with higher productivity to their labor force.



The impact on education of rapid population growth will be reinforced by accelerated urbanization and likely rising regional and global migration. Rapid urbanization will increase pressure on education access but could also reduce unit cost. Further, regional migration will increase in step with progress towards regional integration, offering significant opportunities for economies of scale in the supply of, especially, higher education; it also offers benefits for both labor market supply and demand. Migration between Africa and other regions could also change considerably, depending on immigration policies in the OECD and in emerging

economies as well as African countries' ability to achieve the economic growth required to retain their talent home or in the region and foster "brain gain."

(iii) Economic growth and structural transformation: Rapid growth and labor force transition to more productive sectors will sharply increase the demand for education systems to deliver the skills, knowledge and "change agility" required to both transform the countries' largely non-formal economies and help the modern sector compete in the increasingly globalized and knowledge-based economy. The skills required will be affected by both global and national trends. The former include more open trade and a growing share of services in such trade, Africa's rising share of global FDI, growing regional integration, and the increasing role of knowledge and innovation as determinants of growth. Skill needs driven by national trends include technological catch-up, countries' efforts to specialize in areas where they have comparative advantage, and efforts to address national priorities in areas such as energy, water and food security. Progress in such areas will put pressure on education, training and research systems to promote innovation, entrepreneurship, and knowledge generation/adaptation and application. It will also call for developing life-long education systems to support such society-wide change processes, a daunting challenge in countries where education simultaneously must serve the production modes of pre-industrial, industrial and post-industrial societies and where the needed solid basic human capital foundations have not yet been built.

(iv) The advance in Information Communication Technologies (ICT) has great potential for facilitating African countries' catch-up growth in basic education, to leap-frog stages in the development of post-basic education and to generate scale economies through regional cooperation. The opportunities offered by ICT are many, ranging from enhancing the effectiveness of learning, to improving education management and accountability processes, to developing less costly delivery modes through various types of web-based approaches. Even in developed countries, the effect of ICT in education — a highly labor-intensive industry with little productivity improvement — is only beginning to take off. The impacts on cost, equity in access, quality and employment are likely to be profound. In particular, web-based learning is likely to revolutionize the delivery of tertiary education in Africa and make rapid expansion more financially sustainable through, for example, Open Education Resources such as free Massive Open Online Courses (MOOCs). ICT also has the potential to alleviate skill shortages in health care delivery in cases where nurses and clinicians are able to obtain expert clinical diagnosis online. While not yet widespread in Africa, e-health's takeoff has been swift where it has been piloted, for example, in Tanzania, Lesotho and Kenya.

(v) Globalization will affect education in multiple ways: The advance of the knowledge economy and the strong internationalization trends in higher education and research are leading to greatly increased mobility of students and academic staff. This means that national decisions in the education sector increasingly have implications beyond national borders. This applies to Africa's interaction with the rest of the world but, especially, among African countries. Globalization is not only shaking up most sectors of the economy; it also opens up opportunities for cooperation in education and scientific research across borders and continents making it possible to establish twinning and other arrangements that enhance the capacity and contribution of African researchers. The global production landscape has also changed in that money follows ideas and/or cheap but well-educated labor. This makes China

and India (with 20 million and 30 million students in post-secondary education respectively) attractive as outsourcing hubs because of their high ratings in the availability of skills.

(vi) Pressure for better governance and increased accountability for service delivery will increase as people become more educated and politically engaged. Countries' ability to build institutions for leadership, accountability and innovation will be crucial to sound management of education change processes, and civil society pressure could be a major positive force in improving the quality and equity of service delivery as well as the effectiveness of resource use. It could also strengthen education's role in forming more cohesive and equitable societies thereby enhancing national viability (Collier 2009). Furthermore, as education systems develop, they grow more diverse. In particular, governments' role as often the sole provider of publicly-financed services tend to diminish while the role tends to increase in areas such as standard-setting, quality assurance, certification and other supportive services to enhance the quality of human capital. In turn, this increases the need for stronger administrative systems to perform these roles.

In summary, education systems throughout the world will both face and help shape unprecedented global change during the next decades. Because of their weak human capital base, the challenges will be particularly daunting for many African countries. In the absence of vigorous action, there is a very real risk that some of the weakest countries will fall further behind. Conflict and instability in one country can have very serious negative "neighborhood" effects. But, as discussed below, the opportunities for rapid catch-up growth are also important. Choices made over the next decade will determine the extent to which countries can grasp this opportunity.

Key messages

This paper's main messages may be summarized as follows:

(i) The urgency of rapid catch-up in building basic human capital: The best long-term investment most African countries can make over the next decade is to correct the fact that their young children and youth fare much worse in terms of basic health and education status than those of other regions. This development stage cannot be "leapfrogged": Good quality basic education and health care is the foundation for development in all other areas. In *education*, this means rapidly overcoming the legacy of high levels of illiteracy and out-of-school youth caused by past slow progress towards universal primary education. Therefore, since a large segment of youth currently has either no formal education or incomplete primary education, *governments must select a two-pronged labor force development strategy whereby efforts to provide cutting-edge skills for the modern sector is combined with much stronger efforts than is currently the case to improve basic education skills for the whole labor force.* Not only will this approach help improve labor productivity, it will also help accelerate progress towards other development goals such as improved health, family welfare, and women empowerment; shared growth that will enhance equity and social cohesion; and faster demographic transition.

(ii)...and the need for ambitious catch-up goals: Table 1 suggests a development vision for some key education indicators for 2030 and 2050. The figures are not predictions but represent a vision of what the situation could be in these two years. The vision implies that, by 2030, African countries would have achieved (a) 35 percent coverage of a three-year cycle of pre-school education (corresponding to one year for all) compared to the 2010 coverage of 17 percent in South Asia, 57 percent in East Asia and 70 percent in Latin America; (b) 85-90 percent completion of 8-9 years of basic education as in East Asia and Latin America today; and (c) cutting in half the 2010 illiteracy rate of 28 percent for the age group 15-24 years (approaching South Asia’s projected rate for 2015). If these goals cannot be reached, in the 2030s and 2040s, at least one-third of SSA’s population of prime working age risk to be illiterate and more than one-third of children could be born to illiterate mothers. Both outcomes would have severe negative impact on attaining other key development goals. To avoid this would **require vigorous actions over the current decade** to (a) admit all children to primary education, (b) drastically reduce dropout, and (c) provide second-chance programs for those who have missed out on primary education.

By 2050, Africa would have reached universal coverage of 2-3 years of pre-school education; at least 9 years of basic education for all; and less than 5 percent youth illiteracy for the age group 15-24 years (1-2 percent in East Asia and Latin America today). A post-basic education system capable of responding rapidly to labor market demands would have been developed. Coverage would have reached 80 percent at the upper secondary level and 35 percent in tertiary education, in addition to provision of training through a wide network of programs providing lifelong learning and skill upgrading.

Table 1: Vision for development of key education indicators, 2010-2050 (%)

	2010	2030	2050
GER* in three-year cycle of pre-school education	17	35	80
Completion rate for 9 year cycle of basic education	50**	85-90	90-95
Literacy rate age group 15-24	72***	85	95
GER Upper Secondary	31	50	80
GER Higher Education	7	17	35
*GER = Gross Enrollment Ratio.			
**Based on the 2010 data: 62% of the pupils entering primary education completing the cycle and 80% of those entering lower secondary education completing the cycle.			
*** Actual data for 2005-2010.			

(iii) The main constraint on rapid catch-up is implementation: Most of what must be done to provide basic education and health care is known; the main constraint is poor capacity to translate this knowledge into effective implementation and interventions that better serve the poor. This partly reflects serious political leadership and governance weaknesses that limit the ability to handle effectively the political economy of implementing reforms, including making trade-offs favoring groups who have little political clout but who would benefit the most from basic education and health services. During the last two decades of the 20th century, such constraints were reinforced by stagnating economies that gave little fiscal space for reform. In the first decade of the 21st century, concerted national and global action helped overcome many of these constraints, leading to a major acceleration in human capital formation. Provided countries can (a) reach the level of growth assumed by the “convergence scenario” of the Africa 2050 study (6.6% average annual GDP growth between 2012 and 2050) and (b) accelerate the building of institutions for leadership, accountability and innovation, Africa should be well placed to achieve rapid catch-up growth.

(iv)...but Africa has shown that rapid catch-up growth is possible when conditions are right: Africa registered remarkable enrollment growth during the last decade. SSA’s Gross Enrollment Ratio (GER) for primary education grew by an impressive 18 percentage points between 2000 and 2010 when it reached 101 percent.¹ Enrollment grew by 4.4 percent annually, adding 46 million students, as compared to 3.4 percent during the 1990s (25 million) and 2.5 percent during the 1980s (14 million). Growth also picked up in secondary and higher education where enrollments doubled between 2000 and 2010. It is noteworthy that this development reflects rapid growth by most of the countries that had very low enrollments. For example, Burkina Faso, Ethiopia, Niger and Mali — which all had GERs of less than 10 percent in 1960 and which even in 1990 only had GERs of between 23 percent (Mali) and 33 percent (Ethiopia) — reached GERs in 2010 ranging from 71 percent (Niger) to 107 percent (Ethiopia). Similarly, in the health sector, while the average level of child mortality declined more slowly in SSA than in other regions, countries such as Rwanda and Senegal achieved spectacular improvements, reducing mortality rates between 2005 and 2011 by more than 50 percent.

(v) The imperative of enhancing learning outcomes and relevance: This world-wide challenge is more daunting for SSA than for other regions because countries start from very low levels and have systems poorly equipped to address it. Teachers constitute the single-most important determinant of quality, and handling teacher issues may pose the single-most important education challenge, especially in SSA. First, the need to expand the stock of teachers will far exceed that of other regions. The population aged 5-14 years is projected to increase by 83 percent between 2010 and 2050 in SSA. In addition, 24 percent of SSA’s children of primary school age were out of school in 2010, the provision of pre- and post-basic education as well as of “second-chance” programs must grow rapidly, the quality of existing teachers is poor, and primary school pupil-teacher ratios are high (43 in SSA in 2010 against 18 in East Asia and 22 in Latin America). As discussed below under financing, the main obstacles to providing the teachers required will be funding a rapidly rising salary budget and, less so, to develop the required training capacity. Second, the quantitative and financing challenges are accentuated

¹ This ratio can exceed 100% because of repetition (13% in 2010 in SSA) and late entrants.

by weak mechanisms for holding teachers and school heads accountable for learning outcomes, as well as poor capacity to effectively train, deploy, support and manage teachers.

(vi) Mobilizing sustainable financing through economic growth: The investments required by SSA countries to address the above challenges will be well above those of other regions. This is particularly true over the next decade to fund essential catch-up growth and respond to high population growth. Both the financing needs and scope for resource mobilization vary greatly among countries. However, based on the experience of successful countries in Africa and elsewhere, ***countries achieving the average 6.6 percent annual GDP growth assumed by the “convergence scenario” should be well placed to meet the financing challenge.*** Thus, attaining sustainable growth at a high level is the single-most important condition for sustainable education financing. But this must be accompanied by additional efforts. First, while the median SSA country spends a higher share of its budget (17.6 percent) and GDP (4.7 percent) on education than other developing regions, some countries spend far less and must increase education’s priority. Second, there is room for more effective use of existing resources, especially through more effective use of teachers. Third, education policies must cover the full range of learning opportunities whether they are financed or provided by the public sector or non-public entities. Increasingly, financing of sub-systems such as pre-primary education, adult literacy, vocational training and higher education must include public-private partnerships. Finally, while external aid is likely to become insignificant for most countries by 2050, during the next decade aid can play a very helpful role if used more strategically to help countries use their own resources more effectively. Over time, closer regional cooperation will replace most aid-based cooperation arrangements to generate *economics of scale* in service delivery, *stimulate R&D* targeting African priorities and needs, and *harness benefits and manage risks related to “brain drain”/“brain gain”/“brain circulation.”*

In summary, rapid economic growth, coupled with peace and stability, are key conditions for SSA to bridge the human capital gap with the rest of the world. Most of the basic health and education problems common to developing countries 40-50 years ago — high levels of child mortality, infection, and malnutrition; low levels of enrollment and literacy, especially for women; high birth rates — are increasingly becoming the problems of “non-converging and fragile” SSA countries which also have to deal with new challenges such as HIV/AIDS and climate change. On the other hand, experience shows that rapid catch-up growth can transform societies in one generation. ***But history also shows that achieving such growth is far from automatic; it takes good policies and strong political leadership.***

A strategic agenda to achieve the 2050 vision

Good outcomes in nutrition, health and education are development goals in themselves because they directly improve people’s lives. But they also equip people for productive employment and job opportunities and, through this channel, human capital drives economic and social advances (World Bank 2012a). Despite last decade’s good progress, SSA’s basic education and health indicators lag seriously behind those of other regions. And the gap has been increasing in many areas. Therefore, as noted above, to achieve these “good outcomes” will require *transformative changes* in the education and health sectors of most Africa countries, at a scale beyond that achieved over the past 40 years. Focusing on ***education and***

skills development, the following elements are likely to be part of most African countries' strategic agenda to achieve the 2050 vision:

(i) Broaden access to Early Childhood Care and Education (ECCE): The highest return investment most African countries can make in any sector is to rapidly **correct the fact *their young children fare worse than children in other parts of the world*** in terms of access to key basic education, health, nutrition and sanitation services. As a result, at 121 per 1000 in 2010, SSA's under-five mortality rate is *double* that of South Asia, and five *times* that of East Asia and Latin America. SSA share of the world's children dying before the age of 5 grew from 19 percent in 1970 to 49 percent in 2010. Further, SSA is the only region where the number of stunted children due to malnutrition increased between 1990 and 2010 (from 38 to 55 million). SSA's share of global stunting increased from 15 to 32 percent and is projected to reach 42 percent by 2020. Finally, in 2010, SSA's coverage of pre-primary education was only 17 percent against 48 in South Asia, 57 in East Asia and 70 in Latin America.

Priority actions to improve the education and health status of Africa's children include:

- *Increase significantly the investment in ECCE:* Because of strong interdependence, improving the health and education status of young children requires an integrated strategy. For example, nutrition is a key determinant of a child's capacity to learn and a mother's education plays a key role in lowering mortality and fertility rates. And high child mortality causes higher birth rates as a risk mitigation strategy against childhood deaths.
- *Target vulnerable groups:* Because children's education and health status differ widely depending on family income, urban/rural residence and gender, an *effective strategy must target those most in need* in order to break the intergenerational vicious cycle where different aspects of inequalities reinforce each other to stifle children's life chances.

(ii) Reduce the burden of disease: The high burden of disease is putting a brake on growth in many economies, especially in SSA. The region has 12 percent of the world's population but 25 percent of the world's burden of disease, 70 percent of the people living with HIV and 50 percent of the deaths of children under 5 years. The heavy disease burden lowers labor productivity through missed work days and general debilitation, undermines future capabilities of tomorrow's workers by its heavy toll on children, and necessitates using a high share of scarce resources on care and treatment rather than on investments to grow the economy. Priority actions to reduce the disease burden include:

- *Accelerate the momentum to lower the high levels of communicable and parasitic diseases.*
- *Step up measures to prevent the rise in chronic conditions* such as obesity and heart disease.
- *Address the causes of poor health* by improving nutrition and access to water, sanitation and rural infrastructure; empowering women and removing social and financial barriers to services.

- *Strengthen the health system's management capacity* through greater use of technology, stronger public-private partnerships and increased quality and quantity of health workers.
- *Develop sustainable financing strategies* to provide universal basic health care coverage.

(iii) Build critical foundation skills for all: No country has been able to achieve sustained economic growth without first achieving a high level of literacy and numeracy through universal primary education (UPE). SSA's coverage of primary education more than doubled between 1960 and 1980 to reach 80 percent. It then declined to 73 percent in 1990 and only returned to its 1980 level around 2000. The slow progress in attaining UPE has left a heavy legacy of low educational attainment. The basic cognitive and non-cognitive skills imparted by UPE are a pre-requisite to building the broad-based essential 21st century human capital needed for countries to be able to respond to, and help shape, increasingly complex, rapid and unpredictable national, regional and global developments.

During the last decade, most SSA countries resumed rapid growth in building basic human capital. *It is crucial that this growth be sustained over the coming decades.* Priority actions to achieve this include:²

- *Accelerate efforts to achieve admission of all children and reduce late entry:* Late entry into the first grade is a major factor in causing dropout in later grades: A study covering 16 SSA countries showed that 41 percent of those who entered primary school over the period 2005-2010 were two years or more above the official entry age.
- *Provide "second-chance" programs, including adult literacy training:* SSA's illiteracy rate for the age group 15-24 years is projected to be 25 percent in 2015 (44 million) and 11 percent in North Africa (3 million). In addition, in 2010, 31 million (24 percent) of SSA's children of primary school age were out of school (3 percent in North Africa). In that year, SSA accounted for 51 percent of the world's out-of-school children, up from 39% in 1999.
- *Reduce dropout:* Since the mid-1970s, the rate of drop out prior to Grade 5 has stagnated at about 30 percent. A successful strategy to reduce illiteracy must include reducing dropout.
- *Extend the duration of basic education to 8-9 years:* The skills required to be effective citizens in 21st century societies go beyond those provided through 6 or 7 grades of primary education. Most middle and high-income countries have 9-10 years of compulsory basic education. For labor market, equity and cost reasons, the most effective strategy for most SSA countries to provide longer basic education would be to merge primary and lower secondary education into a new basic education cycle. At 47% in 2010, SSA's enrollment in lower secondary education was well below that of South Asia (75 percent), East Asia (90 percent), Latin America (102 percent) and North Africa (around 100 percent for all countries apart from Morocco at 82 percent).

² The data quoted below are largely derived from (UNESCO 2012b).

- *Make curricula more relevant:* In addition to solid cognitive skills (language, math, science) a longer basic education cycle must provide the non-cognitive skills (learning to learn, problem solving, communications) demanded by employers. How best to adjust curricula to the extensive changes that have taken place in the nature and content of jobs is a worldwide concern. A recent report (OECD 2012a) argues that curricula worldwide are overdue for a major redesign similar to that made in the late 1800s in response to the Industrial Revolution. The 21st century economies require skills that are very different from those of the 19th century and yet the content of education programs worldwide has remained relatively unchanged.
- *Reap the intergenerational virtuous cycle of educating girls and women:* Gender equity is both a human right and a core development goal. By 2010, SSA had close to gender parity in primary education, but lagged in secondary and, especially, in higher education. In addition, only 54 percent of adult women were literate as compared to 71 percent for men. Further, about 25 percent (16 million) girls of primary school age were out of school, feeding the large pool of illiterate women. The high level of female illiteracy represents a **huge missed growth potential and family welfare loss**, given women's dominant role in the rural and informal economy and that their income is more likely to benefit the family through provision of children's food, clothing, health services and education. It also **slows down the demographic transition** and **reduces children's life chances** since both are closely linked to women's education.
- *Enhance the quality of learning:* The quality of learning is decisive in determining how well education can fulfill its multiple roles. In particular, research shows that the level of skills in the workforce, as measured by performance on international student assessments, predicts economic growth far better than average length of schooling. Numerous national, regional and global student assessments show that last decade's remarkable increase in education access in SSA has not been matched by comparable progress in learning outcomes and high proportions of African students complete education cycles without having acquired the requisite competences.³ The complexity of meeting the quality challenge is well illustrated by similar concerns about learning outcomes in developed nations. Priority actions include (i) improving the training, support, deployment, management and accountability of teachers; (ii) addressing the factors causing the high costs and low availability of basic training materials; and (iii) strengthening the education sector's capacity for leadership, accountability and innovation.

(iv) Revitalize technical and vocational education and training (TVET): Africa needs TVET systems that can respond effectively to both the cutting-edge skill needs of the modern, knowledge-based economy and to those of the majority of the labor force engaged in the rural sector and informal economy. To develop such systems is a complex challenge. Existing systems suffer from a multitude of weaknesses: poor quality and relevance; weak links with employers;

³ See the annual EFA Global Monitoring Reports and surveys by the two main networks monitoring education quality in SSA, the "Southern and Eastern Africa Consortium for Monitoring Educational Quality" (SACMEQ) comprising 15 Ministries of Education in Southern and Eastern Africa, and the "Program on the Analysis of Education Systems"(PASEC) for Francophone countries.

lack of sustainable funding; and perception by parents and students of TVET as “second rate” education. Further, while clear success stories exist, there is no blueprint applicable to all countries: “Old” as well as newly industrialized countries have successfully followed quite different approaches. However, as noted by Adams et al. (2013), good quality basic education is the essential foundation for further skills development in both the formal and informal sector. Actions to address current weaknesses of TVET systems to provide skills beyond those provided by basic education include:

- *Improve the governance of TVET* by strengthening the regulatory role of governments and the coordination of public-private training programs.
- *Raise the quality of TVET* through a skills-based approach to training, upgrading the skills of master craftsmen and modernizing traditional apprenticeship systems.
- *Establish national certification frameworks* for validating the skills acquired.
- *Develop national skills inventory and labor market information systems* that analyze the supply and demand of labor and track the growth sectors of the economy.
- *Foster the development of partnerships* between schools, training providers and employers to increase the relevance of training and lifelong learning.

(v) Build human capital for knowledge and innovation-driven economies: As already noted, the role of knowledge and innovation as drivers of economic growth has risen sharply over the last couple of decades. This development has particular importance for education, given the sector’s role in creating, adapting and transmitting knowledge. And the importance is not limited to the “knowledge economy”: Knowledge and innovation are key drivers of productivity throughout the economy — ranging from agricultural yields to the effectiveness of public service delivery. Therefore, education and training programs must both respond to the skills demanded by the present economic structure *and* anticipate emerging skill needs to support the growth sectors. And the role of education is not limited to higher education and research but includes basic human capital formation starting with literacy and numeracy. Key actions beyond building these basic skills include:

- *Broaden access to quality upper secondary education* to strengthen the critical link between basic and higher education and the bridge between the school system and the labor market.
- *Channel tertiary education towards the creation of innovative capacity and scientific and technical knowledge and proactively link academic institutions to business and industry.*
- *Invest at least 2 percent of GDP in R&D and provide incentives for tertiary institutions and industry to collaborate in applied research in strategic areas.*

(vi) Strengthen the articulation between education and jobs: In addition to reflecting insufficient employment generation, high levels of youth unemployment are caused by lack of basic skills, mismatch between skills and labor market demands and misalignment arising from evolving skill requirements. The type of actions discussed above are the surest ways of

facilitating the transition from school to work and making youth trainable and adaptable to changing work situations, that is:

- *Provide high quality basic and secondary education, revise program content to better respond to labor market demands, provide second chance programs, and foster partnerships between schools, training providers and industry.*
- *Broaden the system of delivering initial training and, in particular, skills upgrading, to include different pathways of lifelong learning through online and on-the-job training.*

(vii) Reinforce training and skill development through regional cooperation: As already noted, globalization is greatly intensifying the need for regional cooperation in education and research. Beyond the growing internationalization of higher education and research, regional cooperation offers benefits in many areas including life-long learning, curriculum development, quality assurance, open education resources, use of ICT, etc. Increasingly, national decisions in these areas have implications beyond national borders. Moreover, the cross-border *movements of education and health workers* and the *trade of education and health services* are likely to grow sharply. This will deepen the capacity of higher education in small states, leverage economies of scale and reduce the time it takes for countries to develop the skilled workforce needed in select priority areas. Actions to harness such benefits include:

- *Develop an ambitious regional vision for transformational change of education systems in Africa.* Such a vision will help raise the level of ambition at the country level, facilitate collective actions on common issues, strengthen the hand of in-country reformers, and promote cross-country knowledge sharing and benchmarking.
- *Increase the support for regional networks and centers of excellence* to strengthen joint research, deepen national capacity, leverage economies of scale, and reduce the time needed to develop the skilled workforce required in select priority areas.
- *Establish common educational standards and certification systems* to increase the flexibility and mobility of labor across the continent.
- *Strengthen inter-country and inter-university exchanges* of staff, students, research and partnerships with the private sector.

In summary, to realize the **transformative change** in education and health systems needed to reach the “Africa 2050 vision” will, for most countries, require sustained long-term actions at a scale beyond that achieved over the past 40 years. This is needed to deal both with the legacy of slow human capital formation in the past and to respond to, and help shape, increasingly complex, rapid and unpredictable national, regional and global developments. The challenges in implementing the suggested action agenda will be daunting and, given the long-term nature of human capital formation, the choices made over the next decade will be particularly critical to attaining the 2050 vision. However, given the right conditions, rapid catch-up growth is possible. And the most important of such enabling conditions is **strong, broad-based national political leadership**. To accelerate human capital formation must be a strategic national development priority; thus, implementation of the actions needed is not limited to the ministries of health and education. Stiglitz (1996) underscores just how critical such leadership

was to the economic success of East Asian countries by concluding that the “real miracle of East Asia may be political more than economic” and that what seemed to lie at the root of sustained success was not the individual set of policies but rather their nexus, the policy choices that governments made, the manner in which they were implemented, and the flexibility and responsiveness that was built into institutions.

Building Critical Human Capital Foundations

Invest in all young children: A moral imperative and smart investments

Perhaps the highest-return investment most African countries can make in any sector is to rapidly correct the fact that their young children fare worse in most areas than children in other parts of the world. SSA has the highest levels of child poverty, and children suffer from “severe deprivation of food, safe drinking water, sanitation, health, shelter, education, information and basic social services” (Garcia 2008). Box 1 shows that, despite recent improvements, SSA’s basic child indicators not only lag far behind other developing regions; in many cases, the gap is increasing, both with other regions and among SSA countries. **For African countries to not rapidly ramp up investment in young children would be a strategic mistake that would impact negatively their long-term development prospects.**

Recent research shows that investing in Early Childhood Care and Education (ECCE) yields high social and economic returns and the poor benefit the most. Heckman (2006) concludes that the first 6 years of life are critical for brain pathways and processes to develop and that it is possible to compensate for adverse family environments if action is taken in the early years. Naudeau et al. (2011), summarizing global research in this area, conclude that ECCE interventions:

- i. Enhance school readiness and education outcomes through improved nutrition, mother’s education and preschool education.
- ii. Improve physical and mental health and reduce reliance on the health care system through better nutrition, hygiene, immunization and early stimulation and learning.
- iii. Reduce high-risk behavior such as smoking, risky sexual behavior, substance abuse, and criminal and violent activities in adulthood.
- iv. Have positive externalities because child care increases schooling of older female siblings and raises mothers’ labor force participation.
- v. Are more cost-effective than remedial interventions even in areas where such interventions are possible. For example, severe malnutrition in the first two years is irreversible, as it causes permanent negative effects on the physical and intellectual capabilities of a child. Save the Children (2012) refers to this effect as a “life sentence for children”.

Because of strong interdependence, to improve the health and education status of young children requires an *integrated strategy*. For example, child mortality, malnutrition and school attendance as well as fertility rates are closely related to women’s education. Because

children's education and health status differs widely depending on family income, urban/rural residence and gender, an *effective strategy must also target those most in need* in order to break the intergenerational vicious cycle where different aspects of inequalities reinforce each other to stifle children's life chances.

Box 1: The imperative to sharply increase SSA's investment in young children

- **Under-five mortality:** At 121 per 1000 (2010), SSA's rate is *double* that of South Asia (67), and five *times* that of East Asia (24) and LA (23). It exceeds the rate of East Asia and Latin America in 1970 and of South Asia in 1990. In 1970, 19 percent of the 16.6 million children world-wide dying before age five was in SSA. In 2010, the world-wide number declined to 6.6 million but SSA's share increased to 49 percent.
- **Malnutrition:** SSA is the only region where the number of stunted children increased between 1990 and 2010 (from 38 to 55 million). SSA's share of global stunting increased from 15 to 32 percent; and is projected to reach 42 percent by 2020. In 2010, SSA had 16 of the 24 countries with stunting of 40 percent or more.
- **Pre-primary education:** In 2010, SSA's enrollment ratio was 17 percent against 48 in South Asia, 57 in East Asia and 70 in Latin America. While SSA's GER grew by seven percentage points between 1999 and 2010, the growth was much faster in other regions which started from a much higher initial level.
- **Combined impact:** UNESCO's ECCE index combining the three above indicators covers 68 developing countries. SSA accounts for 19 of the 25 lowest ranked countries, including the ten ranked lowest.

Source: UNICEF 2012; UNESCO 2012b

Much is known about how to design successful ECCE programs, and the UNESCO EFA Global Monitoring Report reviews yearly progress towards the pre-primary education part of ECCE. Institutions such as UNICEF and Save the Children also have extensive expertise. What needs to be done is clear, and cost-effective interventions exist to get it done. The main constraint is insufficient political commitment, capacity and financing for poor countries to be able to use this world-wide knowledge to develop and implement policies and programs adapted to local conditions. Implementation of holistic ECCE interventions is a challenge even for rich countries. Child development is a cumulative effort and activities must be sequenced depending on the age of the child. Programs can also be provided in a range of locations, and can be owned, financed and managed by governments, communities, NGOs, private businesses, religious institutions or in partnership among such entities.

Due to this complexity, to staff, finance, coordinate, monitor and evaluate ECCE provision is a huge task for governments facing severe capacity constraints. **And yet:** If SSA countries are to catch-up with the rest of the world in terms of the education and health status of their children, they must give this task drastically higher political and budgetary priority, often through partnerships with various non-government entities. In a wide-ranging review of strategies for reducing inequalities and improving developmental outcomes for young children in low- and middle-income countries, Engle et al. (2011) conclude that: "Unless Governments allocate more resources to quality early childhood development programs for the poorest people in the population, economic disparities will continue to widen" (p. 1339).

How much would it cost? Drawing on existing studies, this report can only highlight the magnitude. Because of the wide variety of content and coverage, comparative data on ECCE funding are very scarce worldwide. Naudeau et al. 2011 quote estimates showing that, in 2005,

OECD governments spent on average about 2.36 percent of GDP on a broad range of services to families and young children, including 0.50 percent of GDP on *pre-primary education* for the age group 3-6 years, of which 0.43 percent was public funding. The study ranks 57 countries according to the pre-primary share of public *education* budgets. The median share was 6.5 percent, ranging from above 10 percent in eight countries to less than 1 percent in five, including three of the seven SSA countries covered.

A rough indication of the magnitude of the funding required for SSA to reach a GER of 80 percent in 2050 is to compare it to the funding of primary education: In 2010, SSA's GER in primary education was 101 percent, and public spending equaled 2.2 percent of GDP. The average duration was 6.2 years. Thus, the cost of providing one grade of the "average" 6.2 grade cycle was about 0.35 percent of GDP. Because of (i) higher unit costs in pre-primary than in primary education⁴ (largely because of lower pupil-teacher ratio in pre-primary), and (ii) larger age-cohorts (due to population growth), the cost of one year of pre-primary education is roughly 1.5 times that of primary education, i.e., 0.53 percent of GDP.⁵ The average official duration of the pre-primary cycle in SSA is three years. Thus, to achieve a GER of 80 percent in 2050 would require spending 1.27 percent of GDP on pre-primary education, up from about 0.1 percent in 2010.

Clearly, it would be difficult to achieve an 80 percent GER for 2050 through public funding alone: 1.27 percent of GDP would correspond to about 27 percent of the total education budget, up from about 2 percent now.⁶ Also, SSA's population of pre-primary age is projected to increase by 60 percent between 2010 and 2050. The current 17 percent GER is achieved through 55 percent of private provision (15 percent in the OECD), largely for better-off families in urban areas. To ensure that the poor — who can benefit the most — receive services, public funding must increase and be well targeted. Thus, even to double the GER by 2030 is likely to both mean a substantial increase in the share of public budgets allocated to pre-primary education *and* success in building public/private partnerships where communities, NGOs, etc., provide both financial and in-kind support.⁷ And progress can be rapid: Ghana increased its pre-primary enrollment ratio from 31 percent in 1999 to 69 percent by 2009.

Ramp up investments to complete the UPE agenda

SSA's current lag in basic literacy and numeracy compared to other regions is largely a legacy of the region's sluggish progress towards good quality Universal Primary Education (UPE) and neglect of adult literacy programs. This section summarizes the factors that caused this legacy, highlights the magnitude of the need for second-chance programs resulting from this legacy,

⁴Unit cost in SSA in the early 2000s was 1.37 times higher in pre-primary than in primary education (Jaramillo and Mingat 2008).

⁵This GDP per capita cost of providing *one* grade roughly equals the cost quoted above for OECD countries of providing *the whole pre-primary cycle* (mostly 3-year) because the pre-primary age group in a SSA country is more than 2.5 times that of an OECD country and, measured in GDP per capita terms, teacher salaries in SSA are about twice those of OECD countries. The impact of the latter factor is partly compensated for by higher pupil/teacher pupil ratio in SSA (27 versus 15).

⁶SSA's 2010 GER of 17 percent equaled 11.9 million pupils of whom 2/3 were in 7 countries totaling 40 percent of SSA's 5-year olds. The 2010 GER 2010 corresponds to enrolling about half of SSA's five-year olds. The GER of 35 percent in 2030 means providing one-year for a whole age-cohort; the 2050 target means providing for 80 percent of the three age-cohorts 3-6 years.

⁷Data for Cape Verde, Guinea, Guinea-Bissau, and Senegal suggest that, for these countries, public spending was on average more than three times higher in public than in community run programs (Jaramillo and Mingat, 2008).

and discusses cost and finance implications as well as the importance of vigorous action over the next decade.

Box 2: The education legacy caused by slow progress towards Universal Primary Education (UPE)

SSA's lag in basic literacy and numeracy is largely a legacy of four factors:

- a) **The colonial legacy:** In 1960, SSA's GER in primary education was 35 percent compared to 57 in South Asia, 72 in Latin America and 97 in East Asia (UNESCO 1993). Several countries — Burkina Faso, Ethiopia, Mali, Mauritania, Niger and Somalia — had GERs of less than 10 percent. At a GER of 3 percent, secondary education was practically non-existent. Some countries had no secondary school, and most did not have a single higher education institution. The situation was only slightly better in North Africa. The GER in primary education was around 45 percent in Algeria, Libya and Morocco and 65 percent in Egypt and Tunisia, and the secondary GER ranged from 4 percent in Morocco to 18 percent in Egypt.
- b) **The post-1980 economic crisis:** SSA had strong education growth between 1960 and 1980, reaching a GER of 80 percent in primary education and overtaking South Asia and the Arab states. Primary enrollment increased by a factor of four, secondary by a factor of 10 and tertiary by a factor of 19. But the next two decades saw stagnating education budgets, resulting from economic decline, and SSA's GER in primary education declined to 73 percent in 1990, and only regaining the 1980 level in 1999.
- c) **Low internal efficiency:** Repetition and dropout remains high. In 2010, 13 percent of primary school pupils in SSA were repeaters. While down from 17 percent in 1999, this level was much higher than in other regions. The level of dropout prior to Grade 5 has remained at about 30 percent since the mid 1970s.
- d) **Failed literacy programs:** In the 1960s and 1970s, SSA countries aimed to eradicate illiteracy through rapidly attaining UPE and the provision of adult literacy programs. But the outcomes of the latter were often disappointing—because of poorly trained instructors, little use of local languages and content of low relevance to adults—so they were largely abandoned in the 1980s. With progress in primary education slowed by the post-1980 crisis, SSA entered the 21st century with far lower literacy than other regions. Persistent low female literacy is especially worrying given the multiple benefits.

Historically, no country has been able to achieve sustained economic growth without first achieving a high level of literacy and numeracy. These are not only core competencies but are also the foundation for development in all other areas. In addition to constraining economic growth, lack of basic literacy and numeracy skills is a formidable factor of exclusion from many aspects of life and has strong gender and poverty dimensions which compound its exclusion effect. The extent to which African countries are able to provide high-quality learning opportunities to all their citizens, starting with solid basic education, will condition their ability to attain the Africa 2050 vision.

SSA's current lag in basic human capital formation is largely a legacy of the four factors summarized in Box 2. If not vigorously addressed over the next decade, this legacy will severely constrain SSA's ability to achieve many of the preconditions for the "convergence scenario", such as productivity gains and sustained, shared economic growth; reduced disease burden; accelerated demographic transition; and informed citizenry. Progress in two areas will be particularly crucial (i) Provision of second-chance programs for those who have missed out on primary education; and (ii) Extension of the duration of basic education. As discussed later, a third crucial area is to enhance the quality of learning.

(i) Provide second chance programs: For policy formulation, it is useful to distinguish between three groups of victims of the “slow attainment of UPE legacy” that need a second chance:

- *Out of school children:* In 2010, 31 million (24 percent) of SSA’s children of primary school age were out of school against 12 percent for South Asia, 14 percent for the Arab states, and 5 percent for East Asia and Latin America. The number of out-of-school children in SSA declined rapidly in the early 2000s, slowed down after 2005 and *increased* by 1.6 million between 2008 and 2010. In 2010, SSA accounted for 51 percent of the world’s out-of-school children, up from 39 percent in 1999. The number declined sharply in North Africa, from 2.2 million in 1999 to 590,000 in 2010 (3 percent of the school-age population). Around 25 percent of those out of school in SSA are projected to enter school as “late entrants,” and another 20 percent are early dropouts. The remaining 55 percent are not expected to enter school. Thus, in the absence of second-chance programs, about three-quarter of SSA’s 31 million children out of school in 2010 will start their adult life illiterate. These children live disproportionately in conflict-affected countries (above 40 percent); from poor families (children from the poorest quintile are four times more likely to be out of school than children from the richest quintile); rural (twice as likely to be out of school as urban children) and girls (53 percent of total), (UNESCO 2012b, p.4).
- *Illiterate youth:* 25 percent (44 million) of SSA’s population aged 15-24 years is projected to be illiterate in 2015 as compared with 12 percent for South Asia, 2 percent for Latin America and 1 percent for East Asia. In that year, SSA’s share of the number of illiterate youth world-wide would be 46 percent, up from 37 percent in the period 2005-2010 and 20 percent for the period 1985-1994.
- *Illiterate adults:* In 2015, Africa is projected to have 209 million adult illiterates of whom 78 percent would be 25 years or older. Of this total, 176 million (84 percent) would be in SSA and 33 million (16 percent) in North Africa. SSA’s adult illiteracy rate would be 41 percent for women and 27 percent for men. The share of the age group 25 years and above in the total number of illiterates would be 75 percent in SSA and 92 percent in North Africa. The total number of adults who are illiterate is still rising in SSA, while the number of illiterate 15-25 year olds has stabilized at about 44 million and is likely to start to decline given the recent progress in primary education.

The neglect of youth and adult literacy over the last 2-3 decades is partly due to a misconception that, because of the past mixed experience, cost-effective adult literacy programs are not available. They are (Lauglo 2001 and Oxenham 2008). And such programs play an important role in promoting equity because they target populations that have a history of marginalization. Second-chance programs for young adults have been tested in many SSA countries;⁸ these can be adapted and scaled up.

⁸ Examples include: Tanzania abolition of school fees was accompanied with complementary basic education programs for out-of-school children aged 11-17, including child laborers. In Uganda, evening schools and mobile schools are part of the Complementary Opportunities for Primary Education (COPE) program, and a specific project has been designed for the urban

Another misconception is that literacy programs are unaffordable. They are not. First, whatever information is available shows high returns. For example, Oxenham (2003) estimates the returns on three World Bank-financed projects. The Ghana National Literacy Project of 1999 had a private rate of return of 43 percent for women and 23 percent for men, with social returns of 18 percent and 14 percent respectively. A program in Indonesia had returns of around 25 percent, compared to 22 percent for primary education. A Bangladesh program generated private returns as high as 37 percent. In discussing these results, UNESCO (2005) notes that: “the returns to investment in adult literacy programs are generally comparable to, and compare favorably with, those from investments in primary education.”

Second, regarding costs, UNESCO (2005) refers to a survey of 29 literacy programs. The average cost per learner having *completed* the program was US\$68 in SSA, US\$32 in Asia and US\$83 in Latin America. These costs include start-up expenses, training, development and printing of training material, payment of literacy educators and operating costs. As regards capital costs, most second chance programs will be temporary and should rely as much as possible on existing structures, such as classrooms when not used, community centers, and administrative and religious structures.

Lack of vigorous action over the next decade would likely mean youth illiteracy in SSA stagnating at a high level over the next decades, with serious negative implications for the attainment of other development goals. Two “back-of-the envelop” calculations may illustrate the importance of addressing *simultaneously* the backlog of existing illiterate youth *and* the factors annually adding millions of young people to this stock (i.e., less than universal school admission, high dropout and low quality):

- i. Those aged 15-24 in 2015 (25 percent illiteracy) will be in the labor force beyond 2050. Even if everybody were to enter school, if 30 percent of each school cohort continues to drop out prior to Grade 5,⁹ at least a quarter of the population of prime working age would remain illiterate up to 2050 and beyond.
- ii. Given that both youth illiteracy and dropout rates are higher for females than for males and that birth rates diminish with a woman’s level of education,¹⁰ maintaining an “illiteracy status quo” would mean that more than one-third of the children born would have illiterate mothers. This would reinforce the intergenerational vicious cycle of poverty, low health and education status, and marginalization. It would also have global implications given that, by 2050, SSA is projected to account for one in three children born worldwide.

In short, SSA countries must take vigorous action over the next decade to prevent illiteracy from stagnating at a high level. That outcome would have a disproportionate negative effect on the life chances and social mobility of the poor since human capital is often the only capital

poor. Liberia is providing a three year Accelerated Learning Program, covering the six-grade primary education curriculum, for ex-combatants and for those who missed out on primary schooling during the civil strife.

⁹ Traditionally, completing Grade 4 is assumed necessary to gain and retain literacy. But given the low learning outcomes in SSA, a high share of those reaching higher grades may also not have gained permanent literacy and numeracy.

¹⁰ As already mentioned, based on data for 36 SSA countries, Majgaard and Mingat (2012) found that the number of births by age 30 was 3.3 for mothers with no formal education and 2.2 for women with secondary education.

they can acquire. In turn, this would severely constrain countries' ability to reach most other development goals.

(ii) Extend the duration of basic education: Many studies have shown that expanding secondary education may well be one of the highest return investments available to many countries.¹¹ In particular, as shown by East Asian countries, secondary education plays a key role in facilitating the transition of labor from low to high productivity sectors.¹² Table 2 shows that despite SSA's strong progress the last decade, secondary school coverage in 2010 (combined lower and upper cycle) was below that of East Asia and Latin America in 1980 and South Asia in 1990. Given the poor quality of primary education and labor market conditions in most SSA countries, rapid expansion of *lower* secondary education is particularly important: The skills imparted by that cycle are an integral part of the basic education foundation required to operate effectively in 21st century societies and facilitate the transition from largely subsistence farming to higher productivity activities. At 47 percent in 2010, SSA's GER for lower secondary education was well below that of South Asia (75 percent), East Asia (90 percent) and Latin America (102 percent). The five North African countries had close to or above 100 percent coverage apart from Morocco (82 percent). SSA's low GER is caused by (i) past low access to primary education (82 percent in 1990 and 92 percent in 1999); (ii) low survival to the end of the primary cycle (62 percent in 2009), and (iii) low transition rate from primary to secondary education (69 percent in 2010).

Many low-income SSA countries may need to address their needs for basic skills for all beyond the typical six-grade primary education by merging primary and lower secondary education to create a new 8-9 year basic education cycle, followed by competitive entrance to upper secondary. There are good labor market, cost and equity reasons for adapting this approach. For example:

- i. *Labor market:* A good quality 8-9 year cycle of basic education would significantly upgrade the skills of the majority of the labor force, which in the foreseeable future will continue to be engaged in the non-formal farming and non-farming sectors, thus improving the productivity in these sectors as well as facilitating labor transition to more high-productivity sectors. These issues are discussed more fully in Section 3. Suffice it to note here that school to work transition is increasingly difficult in most SSA countries, reflecting both slow growth in modern sector employment and poor relevance of programs leading to students graduating without having acquired marketable skills. Still, while much needs to be done to improve quality and relevance, there is no way that the small modern sector in the foreseeable future can grow fast enough to absorb the rapid growth in graduates at all levels of education.¹³

¹¹ See Lewin and Caillods (2001), World Bank (2005), di Gropello (2006), Verspoor (2008), Mingat et al. (2010).

¹² See McKinsey (2012a) for China, Lee (2008) for Korea and Benveniste (2008) for Thailand.

¹³ Mozambique, one of the "converters" in the Africa 2050 study, illustrates the case. Fox et al (2012) shows that in 2008, only 12 percent of the labor force was engaged in formal sector wage employment (7.8 percent in the private and 4.2 percent in the public sector). The rest was in the non-formal farm (79.5 percent) and non-farm (8.4 percent) sectors. As regards future employment growth, the study concludes that "With the labor force growing at nearly 3 percent per annum, wage and salary employment would need to increase by about 20 percent *yearly* for the next 10 years simply to absorb the majority of new entrants while leaving the existing labor force at their current jobs. This would be 8 times faster growth than this type of

- ii. **Costs:** The cost of building lower secondary schools accessible to *all* rural children would not be feasible for most countries over the next decade. Adding classrooms to existing primary schools would be much less costly. More importantly: recurrent cost per pupil in primary education is only half that of lower secondary education. Finally, an 8 or 9 year basic education cycle would be a year or two shorter than their present primary plus lower secondary education cycle.
- iii. **Equity:** Providing a longer basic education cycle for all would be more equitable than gradually universalizing lower secondary education over the next couple of decades since it would provide 2-3 years of education beyond primary school to all.

In short, public education spending on secondary education must give high priority to a two-prong labor force development strategy whereby efforts to provide cutting-edge skills for the modern sector are combined with efforts to improve basic education skills for whole labor force.

	<u>1960</u>	<u>1970</u>	<u>1980</u>	<u>1990</u>	<u>2000</u>	<u>2010</u>
<u>Primary education</u>						
SSA	35	53	80	73	83	101
South Asia	57	70	76	90	90	106
East Asia	97	110	116	119	110	110
Latin America	72	106	104	105	120	114
the Arab states	46	64	79	81	90	98
<u>Secondary education</u>						
SSA	3	11	18	23	25	40
South Asia	15	23	28	40	46	59
East Asia	...	25	44	47	63	80
Latin America	15	27	44	51	83	90
Arab States	10	20	39	42	61	69
<u>Higher education</u>						
SSA	0.1	0.8	1.7	3.0	4.2	7.0
South Asia	1.4	4.1	4.3	5.7	9.0	17.0
East Asia	...	1.4	3.8	5.9	16.0	29.0
Latin America	3.0	6.3	13.7	16.8	23.0	41.0
the Arab states	1.9	4.3	9.8	11.4	19.0	24.0

Source: Data for 1960: UNESCO 1993; for 1970-1990: UNESCO (1999); for 2000 and 2010: UIS website.

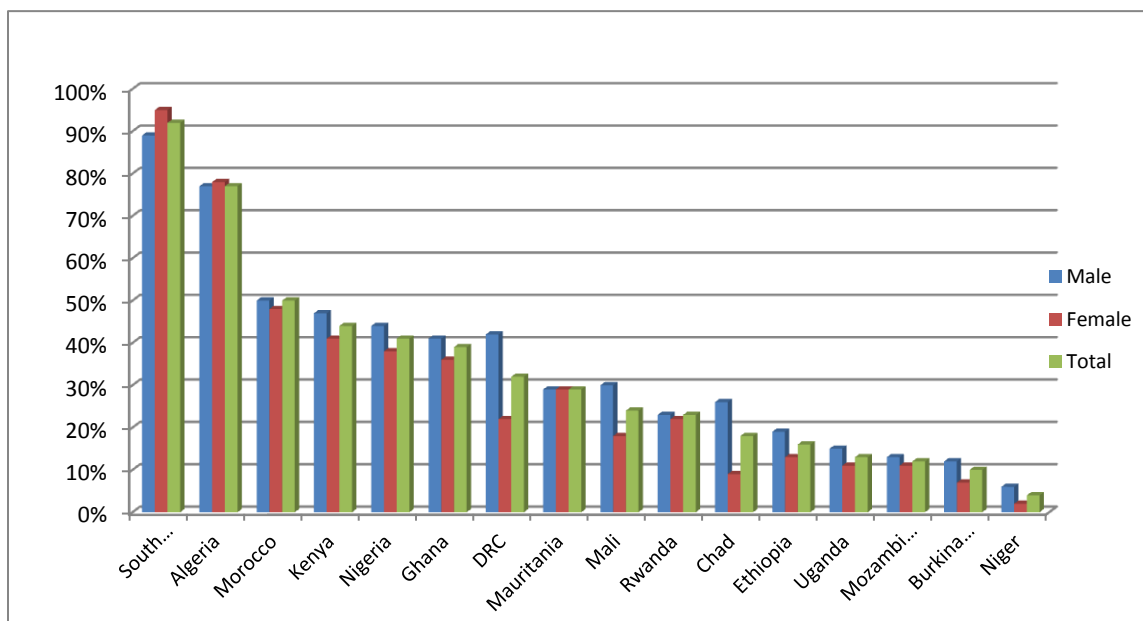
employment achieved in 2002-03 to 2008-09..." (op. cit. p.46). Therefore, most of the employment growth over the next decade will take place in household, non-farm enterprises, and basic education will be a key factor allowing households to shift to this sector which offers higher income. To help make this transition, Mozambique made a major effort over the last decade to expand basic education by extending the duration from 5 to 7 years and reducing dropout. As a result, the GER grew from 69% in 1999 to 111% in 2010, and enrollment by a massive 128%.

Reap the strong intergenerational, virtuous cycle of educating girls and women

Gender equity in education is both a human right and a core development objective in itself. Women’s education enhances productivity and enables them to take greater control of their lives, including by limiting the number of births and, thus, speeding up the demographic transition. Women’s education also improves the health, nutrition and education of their children, thus reducing child mortality. For example, of the 8.2 million fewer deaths of children younger than 5 years worldwide between 1970 and 2009, one-half can be attributed to more education of women of reproductive age (Gakidou 2010). Moreover, health and educational attainment of future generations are directly related to the physical and intellectual condition of today’s girls and young women, i.e., those who will bear and rear the children of the next decades (Levine 2009).

Female education is a powerful instrument for socioeconomic transformation, yet women remain the predominant face of poverty, they have fewer education opportunities and carry a heavier burden. By 2010, SSA was close to achieving gender parity in primary education but lagged in secondary (Figure 3) and especially, higher education. In 2009, the GER for boys exceeded that of girls by 9 percentage point (41 percent versus 32 percent) at the secondary level, and in countries such as the DRC, Ethiopia and Mali, there were three times as many boys enrolled in post-basic education than girls. In addition, too many girls drop out of school because of pregnancy or early marriage. For example, more than 50 percent of girls younger than 18 years get married in Mali, Chad, Burkina Faso and South Sudan. As already noted, priority needs to be given to pre-primary education for the young girl child and second-chance programs to address the high illiteracy among young and adult women.

Figure 3: GER in Upper Secondary Education, 2010



Source: UNESCO – UIS (2011a)

Women’s labor force participation: The employment prospects of young women vary considerably across countries. Out of 15 countries analyzed in AfDB (2012), the female youth unemployment rate was higher in eight. North African countries have much lower female labor force participation rates than the global or SSA averages. The survey also found that in 8 out of 12 SSA countries (and in all countries in North Africa) young females are more likely to be unemployed than their male counterparts. In SSA gender inequalities manifest themselves primarily in the much higher share of women in vulnerable employment in comparison to men. In North Africa women who seek employment tend to face much poorer employment prospects than men with equivalent skills and experience, and female working poverty rates exceed male rates in 22 out of 27 SSA countries with available data (ILO 2011).

Actions to promote gender equality need to be at multiple levels: The 2012 World Development Report proposes three sets of actions to promote the participation of women in economic activities: (i) strengthen their endowments in particular education, health, land and such assets that individuals accumulate over time, (ii) empower them to have voice and control over their decisions; and (iii) increase returns to economic activities. Education is both a means and an end to achieving these objectives. To improve girls’ school attendance, experience demonstrates that the most successful efforts are those that are comprehensive and integrated, for example, combining actions that alleviate constraints to attendance by reducing distance to school, providing sanitation facilities, bringing water closer to homes and provision of child care for younger siblings. Well trained female teachers can act as professional role models for girls which helps to change social attitudes towards extra-domestic roles for women. On average in SSA, 43 percent of teachers are female at the primary level, 29 percent at the secondary level and less than 20 percent at the tertiary level.

Enhance the quality of learning

Differences in learning achievements matter more in explaining cross-country differences in productivity growth than do differences in the average number of years of schooling (Hanushek 2007). The study estimates that a comprehensive 20-year education reform focussed on improving quality would yield a GDP growth of 5 percent more than the same economy would generate without reform. Other research shows that labor force skills — as measured by performance on international student assessments such as the Programme for International Student Assessment (PISA) — predicts economic growth rates far better than do average years of schooling. For example, the OECD has estimated that if its member countries were to boost their PISA scores by 0.25 standard deviations in the next 20 years, the net present value of benefits for the generation born in 2010 would be worth \$115 trillion (OECD 2010).

Only a handful of African countries participate in international student assessments. Morocco, Botswana, South Africa have participated in the Progress in Reading Literacy Survey (PIRLS) and scored at or near the lowest level, between 1.5-2.0 standard deviations below the average. The three existing regional assessments¹⁴ for African countries reveal a worrisome trend which underscores the fact that the remarkable increased in access over the last decade has not been matched by comparable progress in learning outcomes. Assessment results show that some 40

¹⁴ SACMEQ and PASEC have been explained earlier. MLA (Measurement of Learning Achievement) is sponsored by UNESCO. MLA tests students in Grade 4, PASEC in Grade 5 and SACMEQ in Grade 6. The data cover the period 1996-2009.

percent of primary school leavers cannot read. The proportion of 6th graders who are able to read at least at the basic level ranges from 52 percent in Zambia to 98 percent in Swaziland (SACMEQ) and from less than 30 percent in Cote d'Ivoire to 45 percent in Madagascar (PASEC). A recent assessment, covering some 350,000 children in Kenya, Uganda, and Tanzania, tested children on their ability to perform basic numeracy and literacy tasks at the Standard 2 level. The study shows that the children only acquire Standard 2 skills when they reach Standard 4 or 5. In Standard 4, only half of the students are able to pass the Standard 2 Kiswahili test while the pass rates are lower for both numeracy and English (Jones 2012).

Majgaard and Mingat (2012) present a composite index of the measurements of literacy and numeracy skills by the three main learning assessment programs used in Africa. The score on this index can be interpreted as the percentage of the curriculum that students have absorbed and comprehended at the time of testing. The average score for the 31 SSA countries covered was 47, which means that less than half of the students had learned what was expected of them. Applying the same methodology gave a score of 62 for Morocco, 69 for Tunisia and 80 for OECD countries.¹⁵

Poor education quality causes disengagement from learning, and ultimately, dropping out of school, thus reversing the gains made over the last decade in increasing access. For those who persevere, it leads to higher repetition rates and increased failure in acquiring requisite skills, competencies, effects and values. High dropout, repetition and failure rates result waste resources that could have been better used to further expand access and improve quality. Failure to facilitate the acquisition of requisite competencies has a negative impact on labor productivity and achieving inclusive growth as well as broader political, social, human and cultural dimensions of development. Ultimately, poor education quality both limits the opportunity for growth and the re-distributive effects of education, thus reinforcing social and income inequalities and sustaining inter-generational poverty and marginalization.

The poor quality of education at all levels should be a priority national issue. However, partly because wealthier parents send their children to private schools and colleges at home or abroad, there are not enough influential voices to advocate for quality in public institution. For example, when the Times Higher Education World University Ranking 2012-2013 was released, there was hardly any comment, even though it should have sparked outrage and concern, that all African universities (except four) were missing on that ranking. In contrast, the release of the latest PISA results generated heated debate across the OECD countries (The Economist, January 19, 2013).

The main constraint on improving quality is not lack of knowledge about what to do, nor is action necessarily primarily constrained by shortage of resources. The rapid progress required is more constrained by weak institutional and political capacity to turn available knowledge and funding into successful implementation. The rest of this section focuses on three areas key to quality improvement where this holds true: (i) teachers; (ii) training materials; and (iii) institutional capacity.

¹⁵ Based on converting the results from the PIRLS and TIMMS surveys to the MLA scale.

(i) Teachers constitute the single-most important education input in terms of determining learning outcomes, education cost and success of education reforms. A study of the world's best performing education systems concludes that “studies that take into account all the available evidence on teacher effectiveness suggest that students placed with high-performing teachers will progress three times as fast as those placed with low-performing teachers” (McKinsey 2007). The report points out that high-performing systems consistently (a) get the right people to become teachers, (b) develop them into effective instructors, and (c) put in place systems and targeted support to ensure that every child is able to benefit from excellent instruction. Yet, education strategies often pay little attention to factors affecting teacher effectiveness, such as their training, deployment, management, incentives, supervision and accountability for learning outcomes. Interventions in these areas are likely to be the most cost-effective actions needed by African countries over the next decade to improve learning outcomes. The teachers are already paid; the challenge is to make this valuable resource more effective.

But to achieve this will not be easy in the African context of often very poor working conditions for teachers and declining social status. The economic stagnation of the 1980s and 1990s led to primary school teacher salaries (expressed in per capita terms) being almost halved between 1975 and 2000. The decline was particularly steep in Francophone countries where salaries initially were high (Table 3).

Table 3: Evolution of primary school teacher salaries as ratio of GDP per capita (1975 – 2009)					
	1975	1985	1993	2000	2009
Africa (including North Africa)	8.4	6.0	5.7	4.0
Sub-Saharan Africa	8.6	6.5	5.8	4.4	4.3
Anglophone countries	5.4	4.2	4.8	4.2	4.5
Francophone countries	11.5	8.0	6.3	4.8	4.2
Asia	3.7	2.7	2.5	2.9
Latin America	2.7	2.9	2.3	2.3
<i>Source: Mingat and Suchaut 2000 and UNESCO-UIS 2011b. The number of countries covered differs for each estimate.</i>					

At the same time, GDP per capita fell as well (by 36 percent on average for SSA between 1970 and 1997) (World Bank 2000). Thus, despite some progress over the last decade, on average, in real terms, the pay of primary school teacher in SSA is back to where it was in the mid-1970s (UNESCO-UIS, 2011b).

Other aspects of teachers' working conditions also remain poor in most SSA countries: large class sizes (average pupil-teacher ratio of 43 in 2010 compared with 39 in South Asia, 22 in Latin America and 18 in East Asia); low qualifications (a high share of teachers with only primary or junior secondary education);¹⁶ limited availability of teaching materials (see below), and little

¹⁶ SACMEQ data for 2000-2002 show that more than half of 6th grade students in Lesotho were taught reading by teachers with only primary education, and 97 percent of 6th grade students in Tanzania were taught reading by teachers with lower secondary

access to in-service training and other professional support. For example, much of the remarkable progress in primary school enrollment between 1999 and 2010 in Burkina Faso, Mali and Niger noted earlier was achieved by recruiting “contract teachers” paid by the governments or communities but at a much lower rate than civil servant teachers.¹⁷ In general, these teachers received very little professional training.

Countries at all income levels are struggling with how best to use their teachers more effectively. Many developing countries are seeking to do this by introducing a variety of reforms to increase teachers’ incentives and accountability for education outcomes. The interventions include (a) generating and disseminating information about schooling rights and responsibilities, resources received and outcomes; (b) decentralizing school-level decisions to various school-level bodies; and (c) developing student assessment systems and policies that link pay or regular recruitment to performance (Bruns et al. 2011).

Introducing these types of reforms is complex, in part because of the often poor cooperation between governments and teacher unions. But the need is pressing. For example, surveys conducted in 2010 in Tanzania and Senegal (AERC and World Bank 2011) found that the average number of hours per day primary school pupils are taught was 2 hours and 4 minutes in Tanzania against the official schedule of 5 hours and 12 minutes (i.e., 40 percent), and 3 hours and 15 minutes in Senegal against the official schedule of 4 hours and 36 minutes (71 percent). A study for Madagascar (for 2007) concluded that many aspects of the pedagogical process are poorly managed and tasks essential for student learning were neglected. About 20 percent of teachers did not prepare daily lesson plans, school directors rarely followed up with their teaching staff on student performance, communication from teachers to parents on student learning was often perfunctory, pupils’ absence was rarely recorded and communicated to parents, and in only 15 percent of the sample schools did all the teachers and school directors consistently perform the tasks considered essential by Malagasy educators (Lassibille 2012).

In addition to improving the productivity of teachers, SSA countries need to massively increase the size of their teaching force at all levels over the next decades. The population of primary school age is projected to grow by 22 percent between 2010 and 2020 and by 76 percent between 2010 and 2050, adding about 100 million children over this 40-year period as compared to about 85 million during the previous 40 years. All other developing regions, including North Africa, will see a decline.¹⁸ Thus, if SSA countries want to even modestly reduce their pupil-teacher ratio, the number of primary school teachers would need to at least double over this 40 year period. If the duration of basic education were to be extended as proposed above, the need for teachers would increase further, though this would be more than compensated for by less growth in the need for secondary school teachers who are more

or less. In Malawi, Mozambique and Tanzania, more than two-third of 6th grade reading teachers had not received any in-service training over the previous three years (UNESCO-UIS 2006, pp. 58 and 73).

¹⁷ Around 2006, salaries of civil servant teachers were about twice that of government-paid contract teachers (median for 15 SSA countries). Contract teachers hired by communities earned about one-sixth of civil servant teachers. Contract teachers hired by communities comprised about one-third of primary school teachers in Benin, Cameroon, Mali and Togo and as much half in CAR, Congo, and Madagascar (UNESCO-UIS 2011b, p. 51).

¹⁸ North Africa’s school age population is projected to grow by 9 percent between 2010 and 2020 and then decline.

costly. And because of the higher unit costs and current low coverage, the “teacher challenge” will be even larger for pre-primary, upper secondary and tertiary education.

The main obstacle to meeting the teacher challenge will be to finance the resulting increase in the salary budget rather than training them. Rapid growth in graduates from upper secondary and higher education will provide a growing pool of candidates that already have the requisite general knowledge and can be trained professionally through 6-12 month programs rather than the longer programs many countries have now for lower secondary school graduates. Indeed, rapid growth of the teaching force will be a key source of employment for secondary and higher education graduates.

(ii) Teaching and learning material (TLM): In addition to qualified and committed teachers, no other single input is more important to the quality of learning than high-quality teaching and learning materials, especially textbooks. This is especially true in the SSA context where many teachers have little training, class size is large, duration of the actual school year is short, a high percentage of parents are illiterate and homes are lacking alternative reading materials. This is why countries which are known for their rapid progress in education, such as Korea, Singapore and (more recently) Vietnam, gave high priority at an early stage to ensuring universal access to quality textbooks (Fredriksen and Tan 2008).

While comparative data are scarce, a number of country studies show that textbook availability in SSA is low, and textbook costs are high. Supplementary TLM, such as school libraries, is even scarcer. For example, a recent study of primary school textbook availability found that, in 23 SSA countries surveyed around 2010, there were, on average, slightly less than two pupils per book in reading and math. Books in other subjects are much scarcer, and there are large differences between urban and rural areas. And books are even scarcer in secondary education (UNESCO-UIS 2011b).

Textbook prices reported by countries are often not comparable. For example, sometimes the unit price only include manufacturing costs (printing and paper) which only account for about 30 percent of the retail price.¹⁹ And the annual cost of providing one student with the textbooks needed for any given grade also depends on *system* costs, such as (a) the number of textbooks needed per grade; (b) the number of students per textbook; and (c) average textbook life. Read et al. (2007) provide average unit price for textbooks in Grade 9 and the number of textbooks needed in this grade for eleven SSA countries. The median unit price was US\$7.64, ranging from US\$4.61 to US\$18.75, and the median number of textbooks needed was 8, ranging from 6 to 15. The median cost of a set of textbooks was US\$61.10, ranging from US\$25.30 to US\$155.10. After reviewing different policy options for reducing textbook costs, DfID (2010) concludes that in a well-functioning textbook system it should be possible to reach a unit cost of about US\$2-3 for primary education and US\$4-6 for secondary education. This is far below the existing prices in most countries.

Given the wide consensus that adequate provision of TLM is a cost-effective investment to improve learning, why has it proven so difficult to ensure that all pupils in SSA have timely

¹⁹ For example, World Bank (2002, p.18) found that, on average, the retail price of commercially published textbooks in SSA was three times the cost of manufacture. This order of magnitude is confirmed by other studies.

access to essential TLM? This would seem to be a “low-hanging fruit” in improving learning outcomes. And why are textbooks so expensive, a key factor causing the shortages? Other developing regions have largely managed to address these two problems. Over the past two decades, many studies have recommended measures to address the main constraints in each link of the “textbook chain” — content development, publishing, manufacturing, procurement, financing, distribution and effective use in the classroom — causing the low availability/high cost problem. This is one of several areas of education reforms where lack of knowledge about what to do is not the key barrier on progress, but rather institutional capacity and political will to address the problems identified, including dealing with often serious governance problems related to textbook procurement. Three sets of lessons can be derived from these studies:

- i. *Weak national systems*: This is the most important common factor causing the “high cost/low availability” problem. However, *where* in the textbook chain the main constraints occur varies widely between countries; there is no blueprint that fits all.
- ii. *System costs*: As noted above these costs are important determinants of annual per pupil costs. However, they are often neglected when countries design/revise curricula, determine the number of books needed per grade and decide on textbook production specifications.
- iii. *Shortage of financing*: While important, this constraint should not be binding if systematic efforts are made to (a) minimize unit and system costs, and (b) put in place predictable financing for provision of new books to cater to enrollment growth and book replacement. Based on actual primary education budgets for 31 SSA countries and reasonable assumptions about unit and system cost, simulations made by the authors suggest that spending 3-5 % of the budget on textbooks should allow a country to provide all pupils with 3-5 books per grade. To this should be added 1-2% of the budget for provision of other teaching and learning materials.

Finally, the rapid increase in quality, the decline in prices of e-books and other electronic TLM and the widespread availability of mobile phones will radically change the options available over the next decade. It is unclear how this will affect TLM financial needs. It is clear, however, that to harness the opportunities electronic TLM offer, countries will need to put even more effort into building effective systems to deal with TLM issues. First, countries must avoid choices that are technology rather than content-driven, as has often been the case for acquisition of computers and distance learning equipment. Second, over the next decade, the most cost-effective approach is likely to be a mixture of TLM where printed materials continue to be used, at least in primary education, for certain subjects and areas and where electronic materials gradually replace school libraries and are used especially in secondary education for science teaching, replacing traditional labs in some areas.

(iii) Building institutions for leadership, accountability and innovation: To address the type of education challenges discussed in this paper will often require major changes in policies, and programs and budget trade-offs that are complex, knowledge and capacity-intensive and politically sensitive. Few African countries have the institutional capacity required to handle this effectively. In particular, as noted in UNESCO 2007 “countries need much stronger capacity to deal with the political economy of reforms and with technical constraints on implementation.”

Capacity-building in the education sector has been given much attention over the last decades, including by donors. While progress has been elusive, the singlemost important constraint in most countries is no longer severe shortage of technical expertise in education planning and management (except in some fragile states) but low institutional capacity to mobilize, utilize and retain existing expertise; to monitor performance; and to hold managers and teachers accountable for outcomes. Or, as noted in World Bank (2011b): “In sum, to strengthen an education system means to align its governance, management, financing and incentive mechanisms to produce learning for all. This means reforming accountability relationships among all participants in the system so that these relationships are clear, coordinated, and consistent with their assigned functions and that they support national education goals.”

Success in developing better performing systems will require strong political leadership to be able to manage the often difficult political economy of education reform, including handling inter-sectorial linkages. Also, the budget trade-offs are becoming more difficult: The growing demand for post-primary education risks squeezing the funding needed to enhance quality and equity in basic education as well as to provide second-chance programs for out-of-school youth and young adults. Equitable trade-offs to improve the services for poor people requires political will and institutional capacity to confront entrenched interests, which have the advantage of inertia, history, organizational capability and knowing exactly what is at stake.

It is a paradoxical feature of education systems that they seem to have a low capacity to learn and innovate, be it to improve management and accountability, pilot and innovate to develop education policies and programs adapted to local conditions, or apply new technologies to improve the quality of learning. Education systems’ ability to address next decade’s challenges will more than ever depend on their ability to learn and embrace, rather than resist, change, and to be more inclusive and less characterized by “silo” thinking. Even more so than in most sectors, education policies need to be developed through broad-based participation, and implementation needs to be closely monitored with continuous feedback to improve outcomes. A host of players inside and outside the education sector are essential to the performance of the sector and need to be an integral part of the capacity-building effort, with interventions tailor-made to the role they play in the national education enterprise.

To address emerging challenges, the need for capacity in the education sector goes beyond traditional planning and management tasks to more closely monitor resource allocation and use by different schools, geographical areas and population groups; to assess learning outcomes and hold teachers and managers accountable for resource use and learning outcomes;²⁰ and to analyze how well the system responds to labor market demands. To do this does not only require new systems and methods of data collection and use, it also requires development and application of norms, mechanisms, technical capacity and political will to use these data to improve system performance and accountability. Part of the challenge is to handle various types of corruption and academic fraud. As noted by Hallak and Poisson (2007) “creating and maintaining transparent regulatory systems, strengthening management

²⁰ Devarajan et al. (2011) find considerable scope for civil society action to enhance state accountability for development and for pursuance of better policies (including in education) in SSA.

capacities for greater accountability and enhancing ownership of the management process can help build a virtuous triangle that is favorable to educational systems free from corruption.”

In summary, the education sector must become better at engaging with others to build consensus on reforms, strengthen oversight and accountability, prevent leakage and corruption and generate innovative solutions. An important part of building stronger institutions is to build strong inter-sectoral relations and public-private partnerships. Adapting such an integrated approach is one feature that distinguishes successful education systems in East Asian countries (Fredriksen and Tan 2008, pp. 14-15). Closer cooperation between ministries of education and finance is particularly important as recognized by ministers from these two ministries at their meeting in Tunis in 2009 to discuss education financing issues arising from the financial crisis (World Bank 2010).

The Articulation between Post-Basic Education and the Labor Market

With rapid economic growth, Africa will accomplish a labor force transition to more productive sectors which will in turn sharply increase the demand for skills and knowledge. “Change agility” will be required, both to transform countries’ largely non-formal economies and to help the modern sector compete in a globalized and knowledge-based economy. Following a solid cycle of basic education, African countries need to invest in secondary and tertiary education to ensure that the volume and quality of skills needed will be available. They also need to deepen the institutional base for research in universities and specialized institutes and initiate the process of technology development on a much larger scale, as well as technology transfer between research centers and the business and agricultural sectors. Such strengthening is needed to accelerate the economic transition from lower- to higher-productivity sectors and become more competitive in a global, knowledge-based economy.

By 2040 Africa labor force will be 1.1 billion, larger than that of any nation including China and, if current trends persist, by 2050, 1 in 3 children born in the world will be born in SSA, where the population will have more than doubled from the current 1 billion to 2.3 billion (McKinsey 2010). The size and youthfulness of the population is Africa’s greatest, and, as yet, untapped asset. Whether this huge, young workforce becomes an asset will hinge on whether they have the skills and opportunity to become productively employed. This section discusses (i) Issues in aligning skills and employment; (ii) Prospects for future job generation; (iii) Evolving skill needs; (iv) The key role of secondary and higher education in creating the skills needed; and (v) The growing role of knowledge and research institutions.

Issues in aligning skills and employment

Even though economic growth has been robust over the last decade, most of the 7-10 million young people who join the workforce each year in Africa have, at best, a primary education often of low quality and remain unemployed or underemployed. Many young Africans find themselves unemployed or, more frequently, underemployed in informal jobs with low productivity and pay. The challenge of youth employment in Africa, therefore, is not just to create more wage and salary jobs but to increase the productivity of the majority of young people who will be employed in the informal farm and household enterprise sector. Workers’

productivity can be increased through (i) “demand-side” measures, such as better infrastructure and business climate, that lower the costs of production and thus increase the demand for labor; and (ii) “supply-side” measures that improve the skills of workers (Devarajan 2012). In the African context, this means a massive upgrading of the basic skills of the labor force to facilitate the transition from low to higher productivity sectors. McKinsey (2012b) notes that the key to China’s success in making this transition was heavy investments in primary and secondary education, including in rural areas, to prepare its children to join the modern labor force.

Africa’s un and under-employment is driven by a combination of a deficiency of skills, a deficiency of “good jobs” and insufficient growth and structural transformation.

Insufficient basic skills: As noted in Section 2, SSA countries must adopt a two-pronged labor force development strategy whereby efforts to provide cutting-edge skills for the modern sector is combined with much stronger efforts to improve basic education skills for the whole labor force. Low levels of education attainment (Figure 1) limit people’s job opportunities across the continent. For example, a survey of 23 SSA countries showed that, in 2003, 52 percent of the working age population had no formal schooling, 30 percent had some or completed primary education and 18 percent had some education beyond primary education (Majgaard and Mingat 2012).

As already noted in Section 2, the continued high number of out-of-school youth and high dropout rate from primary education are of particular concern since these youth will continue to feed the large pool of illiterate adults. In the absence of vigorous corrective measures, this could mean that up to 2050 and beyond, at least one-third of the labor force of prime working age could lack the basic literacy and numeracy skills needed to be trainable for emerging job opportunities. This would have wide-ranging negative implications because building a strong foundation of cognitive and non-cognitive skills is a pre-requisite to strengthening people’s ability to adapt to a wide range of work situations and enabling them to quickly acquire technical skills relevant to a particular job on site.

Skills mismatch: Demand for higher level skills increases as the jobs become more skill intensive. Between the 1960s and 2009, jobs in OECD countries have shifted from the farm to the factory floor to the professional office. Often, education and training systems respond very slowly to rapid change in labor market demand for skills, resulting in coexistence of high unemployment and critical shortage of qualified individuals to fill vacancies. This is, for example, the case in the European Union and has prompted the EU to embark on a process to radically rethink how education and training systems can deliver the skills needed by the labor market (EC 2012). Similar “skills mismatch” problems exist in most SSA countries. For example, South Africa has some 255,000 unemployed graduates even though many public institutions have 10 percent vacancy rates; in Mauritania some 30 percent of graduates are unemployed. In a survey conducted by McKinsey in nine countries only 43 percent of employers surveyed indicated that they were able to recruit enough skilled entry-level workers.

Insufficient jobs creation: Despite rapid growth over the last 10-15 years, Africa's economies have seen little structural change, with agriculture accounting for nearly 60 percent of employment, the services sector 30 percent and industry 11 percent (World Bank 2011a). The un and under-employment problem reflects this lack of change. In particular, the informal non-farm sector has become the employer of last resort in many countries, absorbing most of labor force growth as well as the decrease in farm jobs. As a result, the level of productivity and income in that sector has declined, reflecting a high level of underemployment (Majgaard and Mingat 2012). In fact, SSA's comparatively low unemployment rate (6.4 percent in 2009) masks high levels of both underemployment and vulnerable employment (AfDB 2012). ILO (2011) estimates that three out of four jobs in SSA are "vulnerable" because workers are on their own-account or engaged as unpaid family workers.

Poor quality of employment is also reflected in that, in 2011, 82 percent of workers in Africa were classified as "working poor," compared to the world average of 39 percent. About 60 percent of the unemployed are young people, and youth unemployment rates are double those of adult unemployment rates in most countries. The problem is particularly acute in middle-income countries. In 2009, youth unemployment in North Africa was 23 percent and 48 percent in South Africa. The public sector, the traditional employer of university graduates, is overcrowded, and the private sector is largely underdeveloped, leading to an increase in "educated" unemployment.

Prospects for future job generation

Informal sector: For the medium term, this sector will dominate youth employment. Therefore, public spending on education and training must give high priority to skill upgrading in these sectors to enhance productivity and facilitate the transition of labor to more high-productivity sectors.

New Jobs: McKinsey (2012b) estimates that Africa has the potential to create 54 to 72 million more stable wage-paying jobs by 2020 in manufacturing, agriculture, retail and hospitality. What kind of jobs would they be? The possibilities include:

- i. *Enlarge Africa's global market share in manufacturing and agro-industrial production.* China is on the verge of graduating from low-skilled manufacturing jobs; this could free up nearly 100 million labor-intensive jobs, enough to more than double manufacturing employment in low-income countries (Rankin et al. 2010). The Ethiopia shoe industry is trending in this direction. Along with low labor costs, many African countries enjoy duty-free and quota-free access to U.S. and EU markets for light manufacturing. But, as shown in Dinh et al. (2012), this would mean removing the many constraints that currently impede the competitiveness of this sector including a lack of entrepreneurial skills (both technical and managerial) and qualified workers.
- ii. *Gain a foothold in the markets for tradable service.* Tourism and agro-industries have potential to expand given the fact that most African countries have a natural comparative advantage in these two areas, for example, Burkina Faso in the cotton sector, Ghana in cocoa and Kenya in tourism. Technology-enabled services are another fast growing area. It is estimated that the total global e-commerce is likely to be \$16

trillion in 2013 and \$20.4 trillion when the global market for digital product and services is included, i.e., 14 percent of all worldwide sales (Jayaram 2012). ICT contributes about 7 percent of Africa's GDP, above the global average. In Nigeria, one sixth of all new registered enterprises in Benin City were providing ICT-related services. In fact, new jobs are emerging whose skills are yet to be defined, let alone inculcated in the training system. Examples include the "green economy" which is likely to generate a range of jobs. Finally, the trade in education and health services is increasing rapidly.

- iii. *Move up the value chain for natural resources and handle more of the value adding processing domestically.* Botswana has recently moved some of the diamond processing, sorting and marketing from London to Gaborone. Sasol, the largest chemical industry in South Africa and the largest employer of engineers in the country, has a global leading edge technology in petrochemicals, oil and gas.

Evolving skills needs

A large body of evidence from research and practice converges on the core essential basic skills for employment as follows: (i) the 3Rs (reading, writing and arithmetic); (ii) life and career skills/non cognitive skills including communication, attitude, and ability and willingness to learn on the job; (iii) learning and innovation skills such as problem-solving and creative thinking; and (iv) 21st century skills such as information, media and technology skills (Lutula 2010). However, there is less understanding of how best to transmit these skills to prospective workers or how to align skills development with the rapidly evolving needs of the labor force. The issue has taken center stage in both rich and poor nations. Key emerging lessons from the U.S. and the EU include (i) the need to increase the talent pool by vastly improving primary and secondary education in mathematics and science and to provide focused training in science, technology, engineering and math (STEM); (ii) a stronger focus on transversal and basic skills especially in entrepreneurial and IT skills; (iii) investment in world class technical and vocational education and training (TVET) systems and work-based learning; and (iv) public-private partnerships to boost innovation and increase cross-fertilization between academia and business.

The Association for Development of Education in Africa (ADEA) recently outlined the core skills needed for Africa to remain on a path of sustainable development (ADEA, 2012), namely, (i) build critical capacities and common core of basic skills; (ii) raise training and qualification levels through a modernized technical and vocational skills development programs; (iii) strengthen science innovation and technology; and (iv) foster regional innovation systems.

In the African context, skills to increase the productivity of the informal sector employment pose a particular concern. A recent survey (Pina 2012) shows that school-based education and training programs seldom penetrate the informal economy, resulting in weak cognitive skills among most informal workers. To the extent that job training in the informal economy exists, it is most often outside of school, primarily in the form of traditional apprenticeships — which are themselves often limited by master teachers' own limited training, overreliance on outdated technologies and poor working conditions. In seeking to address the shortfalls of current education and training models, governments and NGOs have launched pilot programs in

various developing countries; however, they lack systematic, rigorous and quantitative impact evaluation.

In addition to the skills of workers, the survey on light manufacturing in Africa (Dinh et al. op. cit.) found large cross-country differences in the education of firm owners. For example, in Tanzania, only 20 percent of the owners have some secondary education while in Vietnam and China nearly 90 percent of owners have secondary education. In addition to the skill disadvantage, the entrepreneur in Tanzania would have far fewer opportunities than entrepreneurs in China to access established networks and institutions of a well-developed manufacturing sector, which would provide information and support on issues such as market information, new technology, improved inputs and production practices.

In conclusion, because of rapidly evolving skill needs, the best approach is often to strengthen young people's adaptability and trainability by focusing on more general cognitive and non-cognitive skills. More technical skills can then be provided as needed, including by employers on site. This enhances the importance of good quality secondary education as discussed below.

Secondary education

Secondary education is the articulation node between primary and tertiary education and between formal education and the labor market. As such it is simultaneously the end of formal education and preparation for tertiary education and can serve as a pathway for students' advancement or as the main bottleneck preventing equitable access to further education. Policy choices for lower secondary education relate more closely to basic education while at the upper secondary level they are linked more to tertiary education and training. Issues in making lower secondary education an integral part of basic education have been discussed in Section 2; this section focuses on upper secondary education.

The key challenge for secondary education is to effectively fulfill its dual roles: providing skills, knowledge and technical training for youth planning to enter the labor force, while at the same time preparing others for tertiary education. Unfortunately, in too many instances in Africa, secondary education does not fulfill either role effectively. A combination of shortages of schools, poorly trained teachers and outdated curricula and equipment has led to deterioration in quality and relevance, and demand-side constraints, such as the inability to pay school fees, has constrained demand and made upper secondary education inaccessible to large segments of the population.

It is also a crucial link between education and the economy: Labor demand is increasingly biased in favor of skilled workers and appears to be the largest force driving the increasing skilled/unskilled wage differential in industrialized countries. Productivity differences between countries and between firms within countries are profoundly affected by differences in skills and technology. Countries with low levels of education remain in a trap of technology stagnation, low growth and low demand for education. Secondary education seems to be the critical threshold at which major benefits of education kick in. For example, De Ferranti et al. (2003) found that the bulk of the difference in computer penetration between Latin America and the East Asian "tigers," with their significantly wider computer coverage, is partly explained by the proportion of the workforce with secondary schooling.

Africa faces a large and growing gap with other developing regions in secondary school enrollments. The gross enrollment ratio in upper secondary education in SSA was only 31 percent in 2010 as compared to 47 percent in South Asia, 70 percent in East Asia and 76 percent in Latin America. This report proposes 80 percent enrollment in SSA by 2050, i.e., a bit above that of Latin America and East Asia in 2010.

...and it presents a unique window of opportunity to strengthen human capital: Secondary education coincides with a critical stage in development when young people are at a major psychosocial and physical inflexion point. If their energies are misdirected they could engage in risky behavior, e.g., 28 percent of South African schoolgirls are HIV positive according to the Minister of Health; worldwide 13 million girls aged 15-19 give birth each year, and over ¼ million young people under the age of 18 serve as child soldiers in various conflicts around the world. Secondary education serves an important role of nurturing young people through this maturation stage.

As noted earlier, countries at all income level face challenges in better aligning education content to labor market demands. But in addition to such quality and relevance challenges, SSA faces a *massive quantitative challenge* in expanding access in order to cater for increased social demand driven by:

- i. Progress towards EFA, causing an upsurge in the number of young people who have completed a basic education cycle of 8–10 years incorporating all, or most of, lower secondary education.
- ii. Basic education no longer being sufficient to get modern sector employment; upper secondary education offers the opportunities for further formal and informal learning.
- iii. The “Youthquake” – the largest ever cohort of young people seeking post-basic education.

Responding to this demand will be a massive challenge. First, it will be costly. Some cost and financing implications are highlighted in Section 5. While private contribution is likely to be higher for upper secondary than for basic education, the needed expansion of upper secondary education will require substantial increased public funding including because it will necessitate building secondary schools in rural areas and enrolling population groups presently not well served. This will happen at a time when, contrary to other developing regions, basic education and second chance programs also must expand rapidly to cater to population and essential “catch-up” growth. As suggested below, more use of open and distant learning approaches may help lower the costs.

Second, content must be better aligned to national development objectives: While most countries have developed localized curricula and examinations, some aspects still reflect the way secondary education was organized in the 1970s and 1980s in their former colonial powers. In particular: There is often a gap between what is currently being taught in and the knowledge and skills required if countries, firms and individuals are to be competitive. New subjects have increased in relevance and compete to occupy a place in the secondary curriculum; the challenge is to make the curriculum more relevant without worsening the prevailing overload (OECD 2012a). Finally, governance and management systems need to

improve to be able to handle multiple delivery systems, working closely with local school administrations and in broadly conceived public-private partnerships.

Technical and Vocational Education and Training (TVET): The emphasis on TVET in secondary schooling has been a mainstay of development policy for many decades. The objective has been to provide the vocational and technical skills needed to encourage job creation, increase productivity and support economic development. To this end, many policy interventions have been adopted to increase the proportion of students in TVET programs, including the creation of youth employment schemes, technological knowledge courses, and policies that channel students who performed less well in academic subjects into learning skills necessary to become mid-level technicians.

Evaluations have shown little evidence that vocational studies while at school will guarantee that students will acquire more job-relevant skills or experience easier integration into the labor market, than students following traditional academic programs. Moreover, many TVET programs have proven to be more costly and induce higher inequality than traditional academic schooling (Oketch 2007, OECD, 2012a). In addition, recent research shows that vocational students score poorly in subjects such as reading and math, which are precisely the skills that employers are demanding.

All this does not mean that TVET is not an essential part of a country's education and training system. However, careful consideration must be given to aspects such as (i) Providing students with solid general education in language, math and science before they move to more specialized training at training institutions or on the job; (ii) Developing close cooperation between employers and training providers to ensure relevance of programs and facilitate the school to work transition; (iii) Ensuring that TVET programs are not a "dead end" option and considered "second rate" education but that there are pathways to further education; and (iv) Establishing sustainable financing mechanisms. In short, developing a high-quality TVET system is a complex task, and there is no single blueprint about how to go about it. Successful "old" and "newly" industrialized countries have followed quite different paths.

Open and Distance Learning (ODL): Millions of students around the world are now accessing secondary education through various forms of ODL that allows them to study in their own time and at their own pace. Daniel (2010) argues that there is an urgent need to rethink our model of the school as a single location where young people go to study eight hours a day, five days a week. He argues that this traditional model will not be able to cope with the 400 million additional students that will surge toward the secondary school system in the developing world over the next decade. Programs such as Telesecundaria in Mexico (a million plus graduates), the National Institute of Open Schooling in India (1.5 million graduates), and the SLTP Terbuka (Open Junior Secondary School) in Indonesia (2.5 million graduates) have demonstrated that it is possible to deliver high-quality secondary education at scale at a lower cost and with a much wider reach than traditional face-to-face schooling.

Thus, various types of ODL will likely play an important role in African countries' response to the rapidly increasing demand for post-basic education. The key to success is building effective quality assurance mechanisms and accreditation systems to ensure that qualifications are accorded equal status to those obtained in the mainstream system. The approach is particularly

useful for learners in remote areas and those who either missed out on formal secondary education or who need a second chance to earn secondary level qualifications.²¹

Tertiary education

Tertiary education is the engine of a knowledge economy and an incubator of skilled labor: As economies expand and become more complex, they require workers with the technical and cognitive skills to assimilate ideas, adapt new technologies, open new frontiers in science and innovation, generate new knowledge and manage complex institutions and systems. The European Union, for example, has indicated that by 2020 only 18 percent of its hires will have less than tertiary education. A number of studies have also shown that when an economy is faced with major change, education plays a key facilitating role, and the economies with more educated people are the ones that derive the most benefit from change. A person with a tertiary education can expect to earn over 50 percent more than a person with an upper secondary or post-secondary, non-tertiary degree. In Brazil, the Czech Republic, Greece, Hungary, Poland, the Slovak Republic and the United States, men holding a degree from a university or an advanced research program earn at least 80 percent more than men who do not have more than an upper secondary or post-secondary, non-tertiary degree (OECD 2012a).

The urgency of catch-up in providing quality higher education: As noted in the finance section, African countries have devoted a relatively large proportion of their GDP and government budgets to education. They have also accorded high priority to tertiary education which gets, on average, 20 percent of the education budget. Despite this effort, at 7 percent enrollment in 2010, SSA's higher education coverage is by far the lowest of any region; it is at the level of Latin America in the early 1970s and East and South Asia in the early 1990s (Table 2). Part of this reflects the legacy that post-secondary education was practically non-existence at the time of independence: The enrollment ratio was only of 0.1 percent in 1960.²² Thus, while student numbers have increased rapidly since then, this was from a very low base; SSA's GER increased by only 3 percentage points between 1990 and 2010 while the GERs of South Asia, Latin America and East Asia increased by 11, 23 and 24 points respectively. Also, the average coverage masks large differences by country, ranging from below 1 percent in Malawi, to 2-4 percent in countries such as Burkina Faso, Burundi, The Central African Republic, Ethiopia, and Madagascar to 13 percent in South Africa and 26 percent in Mauritius. The coverage of North

²¹Distance learning programs, primarily based on radio, used to be quite widespread in Africa in the 1970s and 1980s but they were mainly used for adult education. For example, in the 1980s, Zimbabwe had a very successful program for teaching science (ZIMSCI kits) and training teachers (ZINTEC). Examples of ongoing successful ODL programs include programs in Botswana (BODOCOL), Namibia (NAMCOL), Zambia (ZACODE) and Mozambique. The Namibian College of Open Learning (NAMCOL) accounts for about 40 percent of the country's secondary school students and is mainly focused on learners who drop out of the formal education system. It follows the same curriculum and examinations as the regular national system (R4D 2012a).

²²"At independence in 1960, Belgium Congo (now DRC) did not have sufficient human capital to run a single government department. There were only 30 university graduates, no doctors, no secondary-school teachers and no army officers. In 1960, only 136 students completed secondary school. Kenya did not have its first African lawyer until 1956. In Northern Rhodesia (now Zambia), only 35 Africans had pursued higher education by 1959, and in Nyasaland (now Malawi) the figure was just 28. The secondary enrollment ratio across Africa was just 3 percent in 1960. In 1961, the year of Tanganyika's (Tanzania) independence, every senior civil servant in Dar-es-Salaam, every provincial commissioner and fifty-five out of fifty-seven district commissioners were still British expatriates"(extracted from Meredith 2011, p. 101).

African countries is much higher than in SSA, ranging from 13 percent in Morocco to 28-34 percent in Algeria, Egypt and Tunisia.

... and of revitalizing the tertiary education system: If SSA's recent economic growth surge "is to evolve into a virtuous spiral that stimulates even higher and sustained growth in a substantial number of African countries, a significant increase in investment in physical and human capital is needed over an extended period" (World Bank 2009b). Higher education provides the "capacity" skills that SSA badly needs to be able to assimilate technological capacity for competitiveness, serve as the basis for innovation in applied research in fields such as engineering and the biosciences, and spawn new industries that can create more productive jobs, better linkages and wider range of exports.

But to simultaneously expand access and improve quality and relevance is a formidable challenge: As countries all over the world are experiencing, simply expanding tertiary education is no panacea: If quality remains low and there are major mismatches between the training provided and labor market demands, the current situation where unfilled jobs co-exist with growing levels of graduate unemployment will persist. Thus, the needed expansion must be balanced with policies to improve quality and relevance. To achieve this balance and to pay for both the expansion and improved quality is a formidable political challenge. Most tertiary education systems in SSA lack the institutional, financial and academic resources to absorb growing demand resulting from broader access to secondary education. As a result, an explosion of undergraduate student enrollment is now threatening to erode any remaining capacities of national systems for research and postgraduate education. A manifestation of this development is the syndrome of "turbo professors": a term used to describe university professors in East Africa who deliver the same lecture to three different groups in one day, first to publicly subsidized students, then to fee-paying students in a "parallel stream" in the same institution, and finally to students enrolled in a private university. These professors would clearly not have the time or energy to devote to graduate programs, thesis supervision or their own research (World Bank 2009b).

With few exceptions, universities in Africa face quite similar challenges (adapted from Butler 2012):

- i. On the whole they are elite systems. While there has been rapid growth in enrollments, country systems remain small and competition for places is intense.
- ii. Demand for higher education has outstripped capacity; this has led to overcrowding and concerns about the quality of offerings. The state of Nigerian universities highlighted in Box 4 is quite common throughout the continent.
- iii. Humanities and the social sciences enroll most students. Enrollments in science, engineering, technology and medicine are low. This partly reflects the higher costs of delivering such courses and partly a weak foundation in the sciences at the secondary level. Many universities have set a target of 60 percent enrollment in the sciences, but few are able to meet the target.

- iv. Enrollment in graduate level courses is very low; doctoral enrollment comprises only one percent of total enrollment. This limits the scope for training future professors for the fast growing student population and scientific and technical leaders for the economies.
- v. There is a growing shortage of university teachers. The current cohort of academic staff is aging, and few young people are choosing an academic career. The discussion of Ugandan universities below underscores the severity of this problem. Also, “brain drain” is high.
- vi. Pressure on resources to improve access to higher education is squeezing funding for R&D.

The case of Nigeria described Box 4 is by no means unique. In Uganda, a 2012 report from the Auditor General’s office indicated that there is a need for close to 3,000 lecturers. Makerere University has a 47 percent vacancy rate. The shortage is a result of increased enrollment, unaccompanied by an increase in resources, coupled with the retirement of large numbers of founding faculty who started teaching at the university soon after independence. In Kenya a similar institutional audit, dated March 1, 2013, indicates a ratio of teaching staff to students of 1:70 and an overall shortage of qualified staff. In some of the newer universities, the only professors on campus are in administration. So concerned are the employers about the quality that some professional bodies (engineering and law) have declined to recognize degrees from some universities (*Kenya Daily Nation, March 16, 2013*).

Box 4: Crisis in Nigerian public universities?

The report of the Committee on Needs Assessment of Nigerian Public Universities, the “Yakubu Report,” presented to the federal government on November 1, 2012, would seem to signal a quality crisis in Nigerian universities which is shared by many universities in Africa. The Committee investigated 61 out of the 74 public universities and found the following:

- Students: 1.2 million students in the public universities, 85% undergraduates, 5% sub-degree, 3% postgraduate diplomas, 5% masters and 2% PhDs. About 57% of students were male and 43% female
- Areas of study: 66% studying arts and the social sciences, 16% sciences, 6.3% engineering, 5% medicine and 6.6% agriculture, pharmacy and law (national policy of 60:40 science based: arts based programs)
- Teaching staff: 37,504 academics, 17% female, 43% with doctorate degrees (norm 75%). Average ratio of teaching staff to students 1:100 (University of Abuja 1:122 and Lagos State University 1:144), compared to an international standard ratio of 1:30 for humanities and 1:25 for sciences
- Teaching infrastructure: Some engineering workshops operate under zinc sheds and trees, classes are held in open air sports pavilions and old cafeterias, fewer than one in 10 universities had video-conferencing facilities, less than 20% made use of interactive boards
- Address systems in lecture halls: “Internet is non-existent, epileptic or slow.” “No university is fully automated and less than 35% are partially automated.”
- Financing: “There is no denying the fact that education is very poorly funded in Nigeria... Nigeria spends less than 9% of the annual budget on education. Botswana spends 19.0%; Swaziland, 24.6%; Lesotho, 17.0%; South Africa, 25.8%; Cote d’Ivoire, 30.0%; Burkina Faso, 16.8%; Ghana, 31%; Kenya, 23.0%; Uganda, 27.0%; Tunisia, 17.0%; and, Morocco, 17.7%”. (Finance Minister, Ngozi-Onkonjo-Iweala, April 12, 2012)

Source: Reported in the Vanguard newspaper, April 12, 2012 and University World News Issue 0263 March 2013

Web-based learning may revolutionize the delivery of tertiary education, making rapid extension financially sustainable through open education resource, such as free Massive Open Online Courses (MOOCs). At a minimum, there is scope to blend MOOCs with traditional teaching whereby, as part of the degree program, students would take some online courses and complement it with face to face teaching to develop the practical skills that are developed through academic discourse. Beyond this, the MIT-Harvard University effort to stream a college education over the Web, for free could be an interesting example of what use of MOOCs might offer for Africa in the future. This program has been termed “the most important education technology in 200 years” (MIT 2012). Online education is not new—in the United States, more than 700,000 students now study in full-time “distance learning” programs. What is different is the scale of technology and the fact that the program is also studying how students learn. It includes video lessons and discussion, incorporates virtual laboratories where students can carry out simulated experiments, and uses powerful technology and cloud computing facilities allowing vast amounts of data to be stored and transmitted at very low cost. Lessons and quizzes can be streamed free over YouTube and other popular media delivery services. And social networks like Facebook provide models for digital campuses where students can form study groups and answer each other’s questions.

These advances in the quality of content, as well as in online interactive pedagogical delivery mechanisms, combined with rapidly declining costs, offer important possibilities for easing the severe stress of numbers and finance faced by African universities. However, even in developed countries, many challenges need to be solved before this approach can become a viable alternative to traditional degree-granting institutions in providing mass higher education. In particular, methods for quality assurance of programs delivered and credible certification of the knowledge and skills acquired must be developed.

This said, given Africa’s low coverage of higher education and the severe financial, academic staff and infrastructure constraints on rapid expansion, the pressure for innovation and new thinking is perhaps more important here than in other regions. And the telecommunication and banking sectors in Africa show just how rapidly development can go when sectors embrace technology and innovation and address major market failures. At the same time, successful provision of education requires much more than speedy transmission of information: In the end, the courses must lead to certificates/degrees that can compete in the labor market with similar degrees from traditional institutions. Therefore, African governments must proactively assess how they can use this new technology to accelerate the development of higher education, often through public-private partnerships. In particular, they must avoid the pitfalls of purely technology-driven solutions. To perform well this facilitating role could, for example, mean that the government's role as a *provider* of higher education will diminish but sharply increase in the area of facilitating quality assurance and developing well-recognized certification services — provided by the private sector or through government-sponsored institutions — for students who have gone through web-based learning programs.

Knowledge and research institutions

As already noted, knowledge and innovation have become increasingly important drivers of productivity and economic growth. In turn, high-quality national and regional institutions that

stimulate research and innovation have become increasingly important. Africa has a small but fairly robust and well-focused knowledge infrastructure including:

Policy think tanks and regional capacity building networks: A 2011 global survey identified 6545 think tanks out of which 550 were in Africa, 1912 in the U.S., 1795 in Europe and 1198 in Asia (McGann 2011). The survey shows a concentration of think tanks in a few countries: 64 percent are in 9 countries – South Africa, Kenya, Nigeria, Ghana, Egypt, Uganda, Ethiopia, Zimbabwe, and Cameroon in that order. In addition to think tanks, there are several flagship regional capacity building institutions and networks. The latter includes the Association for the Development of Education in Africa (ADEA) which has evolved into one of the most authoritative voice on education issues in Africa.

R&D science and technology programs: There are many such programs, mostly in areas that are key to driving economic growth, for example, biotechnology, agribusiness and livestock research. There are also several programs on climate change and the environment, but these are not as well established.

A few specialized universities or specialized programs within universities: Examples include Muhimbili Institute of traditional medicine in Tanzania, South Africa National Space Agency associated with South Africa's win on the bid to host "the Square Kilometer Array (SKA)" the £1.2 billion radio telescope which will probe the mysteries of the Universe and lead the search for life on other planets, and Jomo Kenyatta University of Agriculture and Technology in Kenya, which has done some path-breaking work on rapid propagation of a disease free, faster maturing, high yielding bananas through the tissue culture technology. LAPSE in Senegal — an international laboratory designed to adapting agriculture to climate change and restoring ecosystems — fits into this category as well. These examples illustrate that the foundations for expanding scientific and technological capacity are in place, albeit at a fairly basic level. A well-coordinated regional approach could nurture these programs by giving them priority on regional and international support and managing them as regional strategic resources.

R&D funding: African Union member countries have agreed to spend at least one percent of their public funding on R &D but to date only Malawi, South Africa and Uganda spend close to that amount. With the exception of South Africa, a large portion of R&D costs are covered through external funds. For example, one-third of the R&D costs in Malawi are funded externally; the same is the case for more than half of R&D costs in Mozambique.

R&D outputs: Less than 2 percent of the global total of scientific and technological publications are published by Africans who hold about 0.1 percent of global patents. While very low, the output is much higher than these figures would suggest because a large part of the research is externally funded and even when it is co-authored with African researchers, it is generally published outside Africa and credited to the country of the funding agency. Similarly, many world-class African scientists in the diaspora are conducting cutting-edge research which becomes part of the scientific pool of the host country. The largest contributions are from South Africa, Egypt, Morocco, Nigeria and Tunisia. The R&D output is, nevertheless, too low for the scientific needs of the continent.

In summary, raising R&D output in areas of strategic importance to Africa should be a priority. Economies that have a global competitive edge have made major investments in R&D; e.g., South Korea spends 3.5 percent of GDP on R&D, Singapore 2.6 percent and China, which spends 1.5 percent of its GDP on R&D, has expanded its contribution to global scientific publications to 10 percent in less than a decade and is rapidly catching up with the US in its output of research, patents and innovation.

The African diaspora as a source of knowledge and innovation for Africa

Diaspora networks: African countries, including those in North Africa, have over 30 million official international migrants; however, the size of the African diaspora, including unrecorded and second- and third-generation migrants, is significantly larger. Migrant remittances to Africa exceeded US\$40 billion in 2010. In 2008, about 223,000 students from SSA were enrolled in tertiary education institutions outside of their home countries, representing 4.9 percent of students enrolled in domestic tertiary institutions in their home countries. In many countries, the ratio of students studying abroad to those enrolled in domestic institutions exceeds 25 percent: Botswana (49.9 percent), Cape Verde (40.6 percent), Lesotho (45.1 percent), Malawi (29.3 percent), Mauritius (29.5 percent) and Namibia (42.5 percent). There is a large and growing regional market for higher education, for example, most of the students from Southern African countries who are studying abroad are in South Africa, while Ghana is a major recipient of Nigerian students.

Diaspora as brain gain: Many countries have recognized that the potential contribution of the diaspora to development transcends remittances, and governments are reaching out to engage their diaspora. Nigeria, South Africa, Eritrea and Senegal plan to include their diaspora communities as partners in development projects and many countries inside and outside Africa have established government institutions to interact with their diaspora. Diaspora skills can be tapped by establishing networks of research and innovation with initiatives such as mentor- sponsor programs in certain sectors or industries, joint research projects, peer review mechanisms, and short-term visits and assignments. For example, Morocco and Egypt have involved emigrant scientists in the promotion of science and research at home. The focus is increasingly on engaging the diaspora in business development and job creation strategies. It is estimated that the African diaspora save US\$53 billion annually, mostly invested outside Africa but potentially available for investments in Africa. Ethiopia has issued special bonds to its diaspora, and Kenya, Nigeria, Rwanda and Zimbabwe are also doing so.

Mobilize Sustainable Education Financing

Financing the need for massive education expansion

Major increases in both capital and recurrent education expenditures will be the single most important determinant of whether the huge expansion in education supply needed to reach the “convergence scenario” can be realized. African countries need to cater simultaneously to three main cost drivers:

(i) Demographic pressure: Africa's population aged 5-14 is projected to increase from 256 million in 2010 to 437 million in 2050, i.e., by 181 million or 71 percent. The growth will be very rapid for SSA, from 214 to 392 million (83 percent) as compared to North Africa, from 42.6 to 45 million (5.7 percent). Also, the increase will be especially rapid until 2030, by 97 million (45 percent) for SSA and 4.4 million (10 percent) for North Africa. During the period 2030 – 2050, SSA's population aged 5-14 would increase by another 26 percent while that of North Africa would *decline* by 4 percent. This demographic pressure will have major implications for education financing in SSA. For example, *just to cater to population growth* and maintain in 2030 its 2010 Gross Enrollment Ratio (GER) of 77 percent for the age group 5-14, enrollment would need to increase by some 75 million (45 percent). And the impact of this pressure will be felt at all levels of education as the students' progress beyond basic education.

(ii) Catch-up growth: Even without the population factor, SSA's much lower enrollment and adult literacy rates mean that, over the next decade or two, the magnitude of investments needed will be much higher than in other regions. First, SSA's need for second-chance programs for adults and young people is much higher than in other regions. Second, to increase the 2010 GER of 77 percent for the age group 5-14 to 100 percent by 2030²³ implies an enrollment increase of 146 million. About 61 percent of this is explained by population growth, and 39 percent is needed for *catch-up growth* to reach 100 percent. While to achieve this will be a daunting task, during the 20-year period 1990-2010 SSA did increase its GER for this age group by about the same number of percentage points (from 55 percent in 1990 to 77 in 2010). However, because the population of school age was much smaller, the enrollment increase was only 92 million. Third, in relative terms, the need for catch-up growth and, thus, financing is much higher in post-basic education. For example, for SSA to reach a GER of 50 percent in 2030 for upper secondary education would mean increasing enrollment by about 140 percent.

(iii) Reaching difficult to reach pupils: The cost of catch-up will be accentuated by the fact that those who have lost out on basic education largely belong to population groups who are more difficult to reach than those enrolled: children in rural/more remote areas, from poor families, handicapped and/or groups marginalized in various ways. In general, the marginal unit cost of enrolling these pupils will be higher than the average unit cost of those enrolled. This applies both to the cost of supplying education through smaller schools and class size and the need for demand side interventions to reduce direct and opportunity cost to parents.

In short, the funding needs will be huge. This is paper cannot do more than illustrating the magnitudes of these needs in terms shares of budget shares and of GDP. Given the large and growing differences between African countries, cost and financing issues must be dealt with on a country by country basis.

Funding needs

The two most important education cost components are teachers and classrooms. Funding teacher salaries is going to be the single most important funding challenge. As discussed in

²³ Derived as enrollment in pre-primary and nine grades of primary and lower secondary education, divided by the population aged 5-14. Allowing for repetition, a ratio of 100% in 2030 is consistent with the 2030 targets of one year of pre-primary and 80-90% of completion of a nine-grade basic education cycle.

Section 2, even assuming major progress in using existing teachers more effectively, over the next two decades SSA countries need to *massively increase their teaching force* at all levels of education. For example, to reach a GER of 100 percent in a nine grade basic education cycle by 2030, SSA must almost double the current number of teachers in primary and lower secondary education even to maintain their current high pupil-teacher ratios.²⁴ In constant prices and salaries, this would mean an annual increase in the salary budget of 3.3 percent. Adding even modest improvement in the teaching conditions (e.g., lower pupil-teacher ratio and higher salaries) and the increased needs for teachers in post-basic education would require an annual salary budget increase of at least 4-6 percent. But, again, if the 6.6 percent economic growth assumed under the “convergence” strategy is attained, this should be feasible: SSA had an annual increase of 5 percent in public education spending between 1999 and 2010.

The situation will be quite different in North Africa and other developing regions: Because their primary school age populations have already started to decline (North Africa’s decline will start after 2020), they may maintain their current much lower pupil-teacher ratios while reducing the stock of primary school teachers and start shifting budgets from primary to expanding post-primary education as well as to fund interventions to improve quality.

In addition to teachers, there will be a huge need for increased investment in school infrastructure. For example, based on an average class size of 40 pupils, to cater to the enrollment increase of 146 million between 2010 and 2030 to reach 100 percent enrollment of the 5-14 age group would mean 3.7 million new classrooms. To this must be added replacement costs of the existing stock which is generally in poor condition. Theunynck (2009) presents a detailed analysis of unit costs for new construction and replacement needs in primary education in SSA.²⁵ Using the study’s parameters for replacement needs and unit costs, the number of new classrooms needed increases to 6.1 million, for a total cost of \$71 billion or \$3.6 billion annually between 2010 and 2030. The order of magnitude of this annual cost is about 12-15 percent of SSA’s 2010 total public education expenditures. To this must be added the infrastructure costs of post-basic secondary education. Using the same class size, unit and classroom replacement costs as for primary education (this is likely to underestimate the costs) this would add about \$1 billion annually (corresponding to another 3-4 percent of the total public expenditures in 2010). The infrastructure costs for post-secondary education are likely to be even larger.

The rest of this section highlights some trends in the three main sources of education financing: Public, private and external aid as well as the increasing role of global and regional cooperation to derive economies of scale as well as to share technical expertise and good practice experience.

²⁴ In 2010, SSA had about 3.1 million teachers in primary and 1.0 million in lower secondary education. The pupil-teacher ratio was 43 in primary and 28 in lower secondary education.

²⁵ The low cost scenario is based on community managed programs. The construction cost per classroom including furniture, latrines, water supply, and some office and storage space, is \$11,665. In addition, the replacements need for sub-standard and run down classrooms is estimated at 40% of the total construction need, *op. cit. pp. 139-141*.

Public education financing

While as discussed below, other sources of financing will need to increase over the coming decades, the public sector will remain by far the most important source especially for basic education. The scope for mobilizing the sustainable funding needed may be summarized as follows:

(i) Given the high share of GDP (4.7 percent) and public budgets (17.6 percent)²⁶ SSA already spends on education, **sustained economic growth at a high level** is the single most important condition for meeting future education financing needs. The experience of successful countries inside and outside Africa suggests that if GDP were to grow at the annual rate assumed by the “convergence scenario” (6.6 percent), and the present high priority for education is maintained, *this would provide a good basis for generating the funding needed*. In fact, since independence, SSA’s public spending on education (in GDP terms) has compared favorably to that of some successful Asian countries (Table 4). However, because these countries had strong sustained economic growth as compared to SSA’s decline, these comparable levels of commitment to education translated into very different trajectories in public education financing. SSA’s public education expenditures grew by only about 1 percent annually between 1980 and 1999 as compared to 5.0 percent between 1999 and 2010 (against 1.4 percent in the Arab states, 2.3 percent in South Asia, 2.4 percent in East Asia and 5.3 percent in Latin America). About two-thirds of SSA’s rapid increase over the last decade was explained by economic growth.

	1960	1989	1999	2010
Korea Rep. of	2.0	3.6	3.8	5.0
Singapore	2.8	3.4	3.0	3.3
Thailand	2.3	3.2	5.1	3.9
Vietnam	3.4(1994)	5.5
SSA	2.4	4.1	3.7	4.7

Source: Fredriksen and Tan 2008; UNESCO 2012b

(ii) The **strong interdependence between education and the economy** must guide trade-offs in public resource allocation between education and other sectors as well as between education sub-sectors: *Good quality education* plays a key role in determining productivity and, thus, in achieving sustained *shared* economic growth and employment creation at sufficiently high levels; and *sustained growth* is indispensable to make the needed rapid expansion of education financially and socially sustainable because it generates both the *funding* needed and the *jobs* demanded by the graduates.

²⁶ Education’s share of public expenditures was 13.7% in East Asia, 14.1% in South Asia and 16.8% in Latin America.

(iii) While SSA on average gives high public budgetary priority to education, **this average masks large differences between countries**, and many countries need to give markedly higher priority to education. For example, in 2010, DRC – SSA’s third most populous country with enormous education needs – spent only 8.9 percent of the government’s budget on education (2.7 percent of GDP), relying heavily on school fees to fund even primary education.²⁷

(iv) While rapid growth in education financing is an absolute necessity in most African countries, **much more needs to be done to translate inputs more effectively into increased learning**. As discussed in Section 2, there is considerable scope for using more effectively existing resources, especially through more strategic deployment and management of teachers, better accountability mechanisms for teachers and headmasters, more training materials, and reduction of repetition and dropout.

(v) Increasingly, countries’ education and training policies **must cover the full range of learning opportunities** whether financed or delivered by the public sector or various non-public entities. For example, to be financially sustainable, rapid expansion of pre-school education will need strong public-private partnerships. To be relevant, vocational training must be developed, delivered and financed in close partnership with private industry, and adult literacy programs in close cooperation with communities and NGOs. Finally, private institutions and financing will play an increasing role in the expansion of *tertiary* education. As already noted, this will increase governments’ role with respect to setting standards, quality assurance and accreditation.

Private education financing

Household spending on education in Africa is important, ranging from school fees in both public and private schools to funding of textbooks, school uniforms, classrooms and salaries of teachers recruited by communities. For example, based on household surveys for nine SSA countries, Majgaard and Mingat (2012) found that the average level of household spending for all levels of education (around 2003) corresponded to 42 percent of public recurrent education spending and 37 percent for primary education. This is high, especially for primary education which, in most countries, is supposed to be free. Another survey from around 2005 covering 15 countries found that households financed on average 25.5 percent of total education spending, including 30 percent for primary education (UNESCO-UIS 2011b).

It is likely that the future pressure to expand education will result in greater pressure on private spending. Therefore, to enhance education’s role as the “great opportunity equalizer,” it will be important for governments to make public expenditure trade-offs that enable education to play this role. This will mean giving strong priority to good quality basic education for all, including extending the duration of this cycle, and using more public resources for second-chance programs. The share of public budgets used on pre-primary education will also need to increase but, as discussed in Section 2, rapid and financially sustainable extension of such education will need it to be based on public-private partnerships. Finally, developing financially sustainable strategies for expanding and improving quality of upper secondary and higher education will be

²⁷ Parents in DRC have shown remarkable resilience in supporting education despite an almost complete neglect by the Government during most of the 1980s and 1990s. DRC’s GER in primary education declined from 95% in 1970 to 70% in 1990 and 48% in 1999 and back to its 1970 level in 2010 (94%).

a major challenge for most countries. Often, this will mean increasing private funding in the way many countries in East Asia and Latin America have done. Indeed, as noted by Varghese (2013), a shift of the financing burden of higher education from public to private sources is a common 21st century trend experienced throughout the world.

As discussed in the “Diaspora” section, remittances from migrant workers are playing a role in funding education in some countries. Finally, some funds from private multinational firms and foundations benefit education. The magnitude of such support is however small compared to that of governments, parents and ODA.²⁸ UNESCO (2012b) estimates it to be equivalent to 5 percent of ODA for education by DAC donors. About 20 percent of this is from private foundations. It is not known how much of this support is for Africa. However, while small at present, these and other types of “innovative financing” are likely to increase in the future (Burnett and Bermingham 2010).

The increasing importance of regional cooperation in the education sector

The advance of the knowledge economy and the strong internationalization trends in higher education and research, with the associated greatly increased mobility of students and academic staff, mean that national decisions in the education sector increasingly have implications beyond national borders. This applies for Africa’s interaction with the rest of the world but, especially among African countries. The forces of globalization have not only shaken up most sectors of the economy; they have also greatly intensified the need for cooperation in education and research as well as on aspects such as “brain drain”/“brain gain”/“brain circulation.”

This growing internationalization of education — which goes well beyond higher education and research to cover all levels and types of education including life-long learning, curriculum, quality assurance, open education resources, use of ICT, etc. — calls for greater cooperation among African countries. In terms of financing, this will offer economies of scale in many areas. As already noted, cooperation will be particularly important for Africa’s many small countries (a dozen have two million inhabitants or less) which will find it very costly to develop specialized national training capacity in areas which are essential, but where the labor market is very limited. Thus, over the coming decades, African countries must do more to harness the mutual benefits of increased regional cooperation in the education sector.

More strategic use of development aid for education²⁹

Over the past decades, aid has played an important role in funding education in SSA. In 2010, SSA received US\$3.7 billion (28 percent of all education aid); 48 percent was for basic education. UNESCO (2012b, p.146) estimates the *median* share of aid in total education spending for the period 2004-2010 at about 22 percent for the 27 SSA countries for which data were available. The median masks very large differences by country, ranging from practically nil in some countries to over 50 percent in Mozambique and Zambia. The level of education aid

²⁸ Health benefits much more from such support than does education. For example UNESCO (2012b) refers to one estimate showing that US foundations give 8% of their grants to education and 53% to health. As much as 90% of corporate contributions are from pharmaceutical companies.

²⁹ This section draws on Fredriksen (2011).

was much lower in North Africa than in SSA. For example, the median level of aid to primary education per primary school-age child was US\$5 for Algeria, Egypt, Libya, Morocco and Tunisia against \$14 for SSA (ranging from nil to above US\$60 in five countries).

Education aid increased by 77 percent globally between 2002 and 2010, *but only by 38 percent for SSA*. The increase slowed down towards the end of the period and halted between 2009 and 2010, with a small decline for SSA. It seems safe to assume that the growth in the early part of last decade will not be repeated in the current decade and that, during the 40 year period covered by the “Africa 2050” report, the share of aid in education budgets will decline sharply for most countries. Still, over the next decade, and for some (especially fragile) countries, aid will continue to play a role. The importance of this role in helping countries develop their human capital will depend on the extent to which the aid can be used more strategically, that is, in areas where aid has *comparative advantage* over domestic funding and, further, can provide *additionality* rather than substitute for domestic resource mobilization.

The last decade saw much focus on enhancing aid recipient countries’ ability to develop more evidence-based education plans and decision-making processes. Commendable progress has been made. However, the same degree of attention has not been paid to *enhancing the catalytic impact of aid through more evidence-based aid allocation* by Africa’s external partners. Most of the “Paris Declaration on Aid Effectiveness” focuses on enhancing *technical* efficiency of aid delivery and use; little has been done to enhance *allocative* efficiency by ensure that aid is used where it can have the greatest impact. And most “new” donors (e. g., Brazil, China, India) are not part of the process.

By far the largest share of education spending in most African countries is funded by domestic resources. Therefore, what can be gained from more efficient delivery of aid from DAC countries is limited if the aid is not deployed strategically to maximize the impact of *total* domestic and external funding on education outcomes. The need to use DAC aid more strategically is reinforced by factors such as increasingly tight aid budgets in DAC countries, growing disillusionment about aid effectiveness, an unprecedentedly high level of aid dependency in some countries and rapid growth in funding from “new” donors, as well as from a variety of private sources. Also, as noted earlier, the education challenges that countries will face this coming decade will be different from those of the last decade, and the allocation of aid must evolve to reflect this change.

This paper strongly suggests that aid be used more systematically to help build sustainable systems (e.g., for the improvement of teacher management and accountability, assessment of student learning provision and provision of pre-primary education and textbooks), support second-chance programs to rapidly correct the legacy of the slow attainment of universal primary education and support south-south cooperation. Overall, the guiding principle should be for aid to be more evidence-based. For example, nobody disputes the importance of numeracy and literacy or the positive impact of education of girls and women on a range of economic and social indicators. And yet, almost no aid is used to help address the fact that more than 46 percent of adult women in SSA are illiterate. *The next phase in enhancing aid effectiveness should be to allocate and use aid in a more evidence-based manner.*

Primary Health Care

This section is limited to highlighting the importance of lowering the disease burden in SSA in order to raise the quality of life and improve the productivity of the labor force.

Africa's healthcare systems are at a critical juncture. Rapid economic growth provides new opportunities for countries to achieve better health for their people as an important objective in itself and also as a means to raise labor productivity. The reforms that governments undertake over the next decade will be crucial to lowering the heavy disease burden which acts as a brake on economic transformation in virtually all African countries. SSA has 12 percent of the world population but 25 percent of the world burden of disease. The region accounted for 71 percent of new HIV infections in 2011 and 50 percent of the deaths of children below age 5. More than 80 percent of the 216 million episodes of malaria in 2010 were in Africa.

The heavy disease burden impacts overall development in many ways. For example, it slows down the demographic transition because women continue to have many babies to guard against high child mortality; chronic malnutrition undermines cognitive development of children and lowers their school achievement, thereby perpetuating intergenerational poverty; and high rates of HIV and malaria infection reduce labor productivity through general debilitation and missed work days. To reverse the vicious cycle of ill health and low productivity will require urgent action at several fronts:

- i. Accelerate the momentum to lower the high levels of communicable and parasitic diseases.
- ii. Step up measures to stem the increase in chronic conditions such as obesity and heart disease.
- iii. Address the underlying causes of poor health, in particular by improving nutrition and access to water, sanitation and rural infrastructure, empowering women and removing social and financial barriers to services.
- iv. Strengthen the health system institutional and management capacity through greater use of technology³⁰ and co-operation between the public and private sectors and by increasing the quality and quantity of health workers, in order to promote equity in access to health services, obtain better value for money, and integrate the funding and management of the sector.
- v. Develop sustainable financing strategies to provide universal health coverage.

³⁰ eHealth is still in its infancy but it has potential to narrow health disparities, equip health care providers and enable immense leaps in quality of care. eHealth is being used to extend geographic access to care by connecting remote rural populations to trained health professionals and by providing clinical decision support to improve diagnosis and treatment by minimally trained health workers. Public health informatics tools are enabling practitioners, regardless of their location and resource level, to obtain a more complete picture of a population's health and risk status and gather information from disparate sources. WelTel in Kenya and other similar programs use text messages to facilitate patient communications by allowing health professionals to maintain in contact with patients outside of traditional office visits. The SMS for Life Initiative uses text messages and electronic mapping to track weekly stock levels of anti-malarial drugs in pilot districts in Tanzania, Kenya and the DRC.

Life expectancy: Lowering the burden of disease would enable people to live longer, healthier and more productive lives. The progress of nations is often measured by the rate of reduction in mortality rates, summarized by life expectancy at birth. The findings of a study exploring the impact of health — as measured by life expectancy — on economic growth, suggest that one extra year of life raises GDP by 4 percent. Since 1970, men and women worldwide have gained slightly more than ten years of life expectancy overall. Progress in Africa is comparable but uneven as indicated in Table 5. Southern Africa has lost momentum in the last twenty years because of HIV/AIDS but several countries have made unprecedented gains in the last ten years. For example, life expectancy in Angola, Ethiopia, Niger and Rwanda increased by 12-15 years for men and women, as strategies for HIV control and reduction of childhood diseases have become widespread and effective. However, at the same time, life expectancy *decreased* by 1-7 years in populations severely affected by HIV/AIDS, especially in Southern Africa.

Region	1970		1990		2010	
	Male	Female	Male	Female	Male	Female
South Asia	48.1	49	57.6	59.7	63.4	63.3
East Asia	60.4	63.5	67.3	71.6	72.9	74.1
N. Africa & Middle East	52.7	58.7	65.5	70.2	71.0	75.6
Central Africa	43.9	50.4	48.4	54.3	53.2	58.5
Eastern Africa	48.1	51.6	50.9	54.9	59.4	62.6
Southern Africa	54.4	61.5	60.6	67.7	55.7	60.0
Western Africa	47.0	50.8	53.0	56.5	57.9	60.9

Child and maternal mortality

Child mortality: SSA is the only region where the number of births is projected to increase substantially: By 2050, 1 in 3 children in the world could be born in SSA. A young and surplus labor force could give Africa a competitive edge, but only if the high child morbidity and mortality of children born today is dramatically reduced. In 2012 over 3 million children (about 50 percent of the global total) died before age 5, and of the 26 countries worldwide with under-five mortality rates above 100 deaths per 1,000 live births, 24 were in Africa (UNICEF 2012a).

In recent years, SSA has made significant, but uneven progress in reducing child mortality: The average rate of decline in mortality rates has doubled from 1.2 percent yearly in 1990–2000 to 2.4 percent in 2000–2010. Over a five year period ending between 2008 and 2010, 16 out of 20 African countries saw significant progress and, in a few countries, the improvements were quite dramatic with Kenya, Senegal and Rwanda improving 8-10 percent annually. If this level of progress could be sustained and expanded to more countries, then SSA could close the gap with the rest of the developing world well before 2050. However, scaled-up action would need to

³¹ The Lancet, Volume 380, Issue 9859, Pages 2071 - 2094

start now in countries that are doing less well. For example, countries such as Burkina Faso, Cameroon, Chad, DRC, Mali and Somalia saw an increase in the total number of deaths of children under five (WHO 2012a).

Child deaths are easily preventable through a coordinated set of multi-sectoral actions. For example, Rwanda's dramatic progress was achieved through a multi-pronged community health workers program which focused on the top three causes of under-5 mortality in the country – malaria, pneumonia and diarrhea. The government trained 60,000 child health workers (CHWs) between 2001 and 2012 with the goal of having two CHWs responsible for every village. The CHWs scaled up the community-based fight against malaria and also expanded pneumococcal vaccination and diarrhea prevention and treatment. Malnutrition, which is an underlying cause in more than a third of under-five deaths, could be prevented by improving the overall nutrition of the child, especially after weaning. In addition, micronutrient supplements such as Vitamin A are among the most cost-effective child survival interventions and have been shown to reduce child mortality by as much as 20 percent in Tanzania. Diarrheal diseases, which account for 11 percent of the deaths, can be prevented by improving access to clean water and sanitation, while improving ante-natal care and rural infrastructure would reduce the number of birth related complications which cause about 23 percent of child deaths. It would also reduce the number of maternal deaths. Significant expansion of malaria interventions in Kenya and Uganda has played a major role in reducing malaria deaths which contribute to about 16 percent of child deaths in Africa (Demombynes 2012). Similarly, by increasing coverage of services to prevent mother-to-child transmission of HIV in about 60 percent in SSA, the number of children newly infected with HIV in 2011 fell by 24 percent overall and by 40-59 percent in six countries—Burundi, Kenya, Namibia, South Africa, Togo and Zambia (UNAIDS 2012).

Maternal health: Mothers are the gatekeepers to child and family health, and the quality of the human capital over the next two generations critically hinges on the quality of the mothers' human capital today. In SSA, in 2008, the chance that a woman would die as a result of complications from pregnancy or childbirth was 1 in 31—seven times the rate in South Asia, 19 times higher than in East Asia and 139 times higher than in industrialized countries. At the global level, in 2008, a woman died every two minutes from pregnancy or childbirth related causes, including 576 deaths a day in Africa. Underlying causes include too few health services and providers, poor infrastructure and transport and low empowerment of women. In high mortality countries, 70 percent of women have no contact with health personnel following childbirth, only 42 percent of births are attended by skilled health workers, and 28 percent of women never receive antenatal care.

As in the case of child mortality, most causes of maternal mortality are preventable through a coordinated set of multi-sectoral actions to provide basic pre and post-natal services. In addition, education helps, not only to empower women and increase contraceptive use, to lower the number of births and increase child spacing, but also to increase the use of such services and their delivery by skilled health workers.

Africa has a mixed record in reducing maternal mortality: Nine countries registered an increase between 1990 and 2008 while ten recorded large (50 percent) declines. The rural population's access to basic preventive and curative health packages is crucial and can be expanded

significantly by involving the communities. For example, the Ethiopia Health extension program (HEP) uses more than 30,000 front-line community health workers to deliver various types of basic health care services. A study conducted in HEP and non-HEP villages between 2005 and 2007 indicated that the proportion of households with access to improved sanitation reached 76 percent in the intervention villages (from 39 percent at baseline) and that awareness of HIV/AIDS, knowledge of the use of condoms, access to improved sanitation, coverage of vaccination, as well as of maternal health services all improved dramatically.

Chronic and debilitating illnesses

HIV/AIDS

Never since the “Black Death” ravaged Europe (1347-51) killing about one-third of the population and the “Spanish flu” (1918-20) killed some 50 million people worldwide, has a disease been so virulent. From benign beginnings first recorded in the U.S. in the early 1980s, the disease affected less than one million people in 1981, increasing to 34 million by 2011. Since about 2001, the epidemic seems to have reached an inflexion point and its spread has slowed down, although 2.5 million people (700 per day, 72 percent in SSA) were newly infected in 2011. In four countries, Angola, Congo, Equatorial Guinea and Guinea-Bissau, the number of new HIV infections among children is increasing.

Prevalence: With about 23.5 million (70 percent) of the infections in SSA, the disease has assumed hyper-epidemic proportions primarily in Southern Africa but is a major threat in more than half of SSA countries; an estimated 2 to 3 million people in Ethiopia and Nigeria respectively live with HIV. It was ranked the 33rd cause of the disease burden in 1990, but moved to 5th position by 2011 (Figure 4). Prevalence estimates range from 0.2 percent in Madagascar to nearly 26 percent in Swaziland. Prevalence in West Africa is markedly lower than in East and Southern Africa where several countries have generalized epidemics, including Botswana (24.8 percent), Lesotho (23.6 percent), and Swaziland (25.9 percent). Others such as Burundi have concentrated epidemics with disease hotspots, where prevalence among sex workers (38 percent) is 16 times higher than general adult prevalence. More women than men are infected. In high epidemic areas, infection rates for women are twice as high as men’s. The prevalence has stabilized at high levels in most countries in Southern Africa, but the epidemic continues to pose a major challenge to health and development. In East Africa, prevalence began declining about a decade ago and has remained stable at between 5-6 percent in Kenya, Uganda, Tanzania and Rwanda. In West Africa, prevalence rates are markedly lower, with rates of less than 2 percent with the exception of Cameroon (5.3 percent), Cote d’Ivoire (3.4 percent), Gabon (5.2 percent) and Nigeria (3.6 percent)

The impact is still unfolding: HIV has contributed to the single greatest reversal in human development in modern history. It has orphaned nearly 12 million children younger than 18 years (UNAIDS 2011) in Africa, reduced life expectancy at birth in high epidemic countries by more than 10 years, slowed down economic growth, and deepened household poverty because of the costs associated with treatment and the loss of income. AIDS has also had a devastating impact on the building of human capital through loss of trained personnel and reduced productivity due to frequent absences from work. An earlier World Bank study (Grassly et al. 2002) indicated that Zambia was losing almost as many teachers as it was training due to HIV

and, while the figures might be significantly lower now, such major hemorrhaging of the system would have longer term implications for the development of human capital.

The response: Wider access to *antiretroviral treatment* is saving lives and has changed the way in which HIV is viewed, from a death sentence to a chronic illness. The cost of first line antiretroviral regimens has come down from around US\$10,000 to under US\$100 per person per year due in part to availability of low cost generic medicines. By 2010 more than 6 million people were on antiretroviral therapy. There has also been a major breakthrough in *preventing mother-to-child transmission* and, more recently (May 2011), in *reducing the risk of transmitting HIV between partners* when one of them is not HIV positive. Moreover, rapidly scaling up *voluntary medical male circumcision* has the potential to prevent an estimated 1 in 5 of the people who would have acquired HIV infection from doing so in Eastern and Southern Africa through 2025. Most countries in which this procedure is recommended have endorsed the intervention, adopted roll-out policies and begun training health care workers (UNAIDS 2012). *Behavioral change* is obviously the most effective way of eliminating the disease but in high prevalence countries, it has proved quite difficult to change behavior even among individuals who have full knowledge of the causes of HIV.

Tuberculosis (TB)

New cases of TB have been falling for several years, and the TB mortality rate has decreased by 41 percent since 1990 (WHO, 2012b). In 2011, there were an estimated 8.7 million new cases of TB (13 percent co-infected with HIV), nearly 300,000 cases of multi drug resistant TB and 1.4 million deaths. TB is one of the top killers of women, with half a million deaths among women in 2011. Treatment for TB with first line drugs is about US\$100-500 per patient successfully treated. People living with HIV (PLWHA) are particularly vulnerable to developing TB because of their increased susceptibility to infection, and AIDS continues to be a leading cause of death for them. In South Africa, approximately 60 percent of new TB cases tested for HIV are seropositive, and in Nigeria that figure is 25 percent. Lesotho and Swaziland have high HIV prevalence rates, and the corresponding TB co-infection rates are 77 percent and 82 percent, respectively. There has been a rapid increase in screening for TB among PLWHA, especially in South Africa, but more needs to be done to ensure that all patients are tested for HIV and all TB patients living with HIV receive treatment.

Malaria

An estimated 216 million episodes of malaria occurred around the world in 2010, 81 percent of which in Africa. Malaria accounts for 655,000 deaths worldwide, 86 percent of which are in Africa. Six countries, Nigeria, DRC, Burkina Faso, Mozambique, Cote d'Ivoire and Mali, account for 60 percent of malaria deaths. Nigeria and DRC have the highest prevalence rates. Within the last decade, malaria deaths have been cut by a third in Africa, bringing the levels back to the levels of the 1960s when malaria had been successfully reduced. The disease is being defeated by the simple and cheap promotion of insecticide-treated bed nets, indoor spraying, and effective rapid diagnosis and treatment. A vaccine is currently being trialed and might be available for use within five years. In the Gallup World Poll data for 2011, 18 countries, including Nigeria, Tanzania, Ghana, Angola, Senegal and Mali, perceive malaria as a more serious threat than HIV/AIDS.

Changing disease patterns

Currently, the most frequent causes of death in Africa are infectious and parasitic diseases even though in the rest of the world these diseases cause fewer deaths and less illness than they did twenty years ago. WHO has predicted that by 2030 a major increase in the number of deaths in Africa will be from cardiovascular and respiratory diseases, such as asthma and chronic obstructive pulmonary disease, both of which are related to smoking and fuel-burning for cooking. In North Africa, this epidemiological transition has already taken place, and non-communicable diseases are more prominent given comparably wealthier populations and the eradication of many communicable diseases.

The increase in the incidence of both chronic conditions and the increase in populations living for longer periods with diseases such as HIV/AIDS are driving a new emphasis on preserving good health and widening the current approach to primary healthcare. Better and more focused education will be crucial to prevent African populations from developing chronic diseases in the first place. Further down the line, teaching those with chronic conditions to manage their health will be key to avoiding overreliance on expensive and overstretched health workers and facilities. Reversing the focus from acute to preventive care and from treating single ailments to tackling multiple conditions, will require a significant overhaul of Africa's healthcare systems, in terms of mindset, structure and the training of health personnel.

Sustainable financing of universal healthcare

Most healthcare systems in Africa are underfunded. While 53 African countries signed the Abuja Declaration pledging 15 percent of their national budgets to health, most remain far below that target and about seven countries have actually cut their spending on health over the past decade. A WHO taskforce on innovative financing for health systems suggests that the 49 low-income countries surveyed would need to spend about US\$44 per capita on average (unweighted) in 2009, rising to a little more than US\$60 per capita by 2015, to meet the costs of delivering the specified mix of interventions required to meet the key health goals (WHO 2010). Only 8 of the countries could raise the funds needed and the rest would require external funding ranging from US\$2 to US\$41 per capita by 2015. Treatment of HIV/AIDS, malaria and TB has been largely externally funded (26 SSA countries obtained more than 50 percent of their HIV funding from external sources).

Figure 4: Changes in global burden of disease, 1990-2010

GLOBAL BURDEN OF DISEASE 2010 (WITH CHANGE FROM 1990)						
RANK	WEST AFRICA	CENTRAL AFRICA	EASTERN AFRICA	SOUTHERN AFRICA	NORTH AFRICA & MIDDLE EAST	GLOBAL
1	Malaria +1	Malaria +1	HIV/AIDS +4	HIV/AIDS +4	Ischemic heart diseases ==	Ischemic heart disease ==
2	Lower Respiratory Infection +1	Diarrheal diseases -1	Lower respiratory infections -1	Lower respiratory infections -2	Stroke ==	Stroke ==
3	HIV/AIDS +10	Lower respiratory infections ==	Malaria ==	Stroke ==	Lower respiratory infections ==	COPD +1
4	Diarrheal diseases -3	Protein energy malnutrition ==	Diarrheal diseases -2	Tuberculosis ==	Road injury +4	Lower respiratory infections +1
5	Protein energy malnutrition -1	HIV/AIDS +6	Stroke +3	Diarrheal diseases +3	Diabetes ++	Lower respiratory infections +1
6	Neonatal sepsis +1	Tuberculosis ==	Tuberculosis ==	Diabetes +2	Other cardio & circulatory +1	HIV/AIDS ++
7	Stroke +3	Stroke ==	Protein energy malnutrition -3	Ischemic heart disease -1	Hypertensive heart disease +3	Diarrheal diseases -2
8	Road injury ++	Ischemic heart disease +2	Preterm birth complications +2	Interpersonal violence ++	Cirrhosis +1	Road injury +2
9	Meningitis -3	Preterm birth complications -1	Road injury ++	Hypertensive heart disease +2	Congenital anomalies -4	Diabetes ++
10	Preterm birth complications -2	Meningitis +2	Ischemic heart disease ++	COPD ==	Preterm birth complications -4	Tuberculosis -4
11	Measles -24	Measles -45	Measles -21		Diarrheal diseases -12	

LEGEND

Increased since 1990 Decreased Since 1990 No Change Since 1990

±n: Number of positions changed since 1990
 ++: Not within the top ten in 1990

Font size corresponds to number of places gained or lost since 1990

Lowering catastrophic out-of-pocket expenditures by pooling risks: In 2007, 50 percent of the total health expenditure came from private sources (of which 71% was from out-of-pocket payments by households), about 30 percent from governments, and 20 percent from donors. Only about 5-10 percent of people in SSA are protected against catastrophic risk, and recent studies show that these out-of-pocket health payments pushed 100,000 households in both Kenya and Senegal below the poverty line in a single year. Several approaches are being implemented in Africa to extend health insurance and coverage to the poor. They include (i) *Government health insurance* which offers insurance to workers in the formal sector (e.g., the Ghanaian national health insurance scheme); (ii) *Micro and community health insurance* which are pro-poor, private insurance schemes, allowing employers, various organized groups and families to purchase health insurance at low rates (e.g., Rwanda uses low cost community-based health insurance coverage to provide health care. In Nigeria, the Dutch government, through PharmAccess, provided a grant to subsidize the insurance premium to enable market women to join a low-cost health insurance scheme, and other countries are emulating this approach to provide health insurance to workers in the informal sector); and (iii) *Vouchers* to help the poor access reproductive health and maternal and child-care services.

In summary, the coverage of this section has been limited to emphasizing that the high burden of disease puts a brake on growth in many economies, especially in SSA. The region's heavy disease burden lowers labor productivity through missed work days and general debilitation.

More critically, the high disease burden among children undermines in various ways future capabilities of tomorrow's workers. In addition, a high a proportion of resources that could be invested to grow the economy is spent on care and treatment. Thus, *it is imperative for Africa's future to radically improve the quality and coverage of its basic health care system.*

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