Asia-Africa Cooperation in Human Resource Development

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In the nearly four decades that have elapsed since "structural adjustment" loans from the international financial institutions in Sub-Saharan Africa (SSA) in 1980, there has been little structural transformations in these economies. These economies were then, and still have remained highly commodity dependent both in structure of production as well as exports (Mehrotra and Panchamukhi, 1987; Rodrik, 2008). This means that there was very little growth in domestic manufacturing. Per capita income seemingly resumed growth in the early 2000s after two lost decades of growth in 1980s and 1990s; but still the growth of industry was very limited as GDP growth was driven by commodity prices rising in the international market. SSA exporters benefitted from it, which was visible in GDP growth.

The implication of this pattern of development is that the future can only be bright for the growing youthful population of SSA if they were absorbed in labour-intensive manufacturing; as a consequence, the productivity of the whole economy would rise, wages would increase in agriculture as the labour market would tighten over time and surplus labour could be absorbed in non-agricultural activities. The point is that job growth in non-agricultural sectors is critical not only for GDP growth, but also to alleviate poverty. Without sustained job growth, peaceful conditions would be compromised; and without peace, there would be little growth, as little investment would materialise.

SSA presently has the distinction of having the youngest population in the world, with two-thirds of its population being under the age of 25 years; by comparison, in India, which is regarded as also one of the youngest populations in the world, half of its population is under 25 years. By 2030, SSA would be home to more than one-quarter of the world's under-25 year old population. As this young population – the best educated and globally connected the continent has ever had – enters the world of work, the region would have a demographic opportunity (World Economic Forum, 2017). In other words, the SSA would be faced with the prospects of a larger labour force in search for work. In the absence of non-agricultural job growth, those who are getting education would migrate to urban locations in search of jobs; but without formal industry and modern services, there is little prospect for structural transformation of the economy (the rise in share of industry and services in output and employment). This is precisely the process that the Asia-Africa Growth Corridor (AAGC) can contribute to, in partnership with African governments.

However, in the absence youth achieving at least secondary education, as well as Vocational Education and Training (VET) being imparted to them, this goal of structural transformation cannot be realized. That is why this chapter on the skill development requirements in the East and West African sub-regions acquires significance. It first examines educational and skill levels of SSA's population. It then discusses the economic

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needs of SSA economies to meet requirements of the five-fold priorities identified. In the following section it discusses areas of India's cooperation with the SSA, past and current, and identifies the uniqueness of Indian and Japan's[2] economies with regard to skills and human resource development (HRD). Finally, it identifies the way forward.

1. Sectoral Profile in Education and Skills in SSA

For all persons, skill requirements over the life-cycle are of three kinds – foundational skills, transferable skills and vocation or technical skills. Foundational skills are literacy and numeracy needed to obtain work, which pays well enough to meet daily needs. These skills are the foundation for acquiring the second and third type of skills; hence, completing primary and secondary education of good quality is vital. Transferable skills (also called soft skills) include analysis of problems and reaching for solutions, communicating ideas, being creative, being computer literate, and showing leadership and conscientiousness. Technical and vocational skills require specific technical know-how relevant only to the occupation for which training is imparted.

Among non-specialist scholars, there seems to be a mistaken belief that in manufacturing or modern services or infrastructure (i.e. the kind of projects that would be typical of the AAGC, only VET skills are needed. The fact is that there are many functions in manufacturing or infrastructure development that require general academic education of good quality, not necessarily VET skills. Similarly, a lot of infrastructure project related-skills are not technical at all, but are more in the nature of services (e.g., finance, accounting, customer relations, repair management), which require only good quality foundational skills, excellent soft skills, and some technical skills. Therefore, a skills development strategy that meets human resource (HR) requirements of industrial growth and modern services, SSA countries need (and the AAGC should support) building upon excellent foundational skills.

Millions in the SSA, however, lack foundational skills, and yet they are already in the labour market. The adult literacy rate (15 years and over) in the SSA in 2015 was 66% (13 percentage points lower than in India during the same year), while the youth (15-24 years) literacy rate was 75%. There is very little emphasis in schools on transferable skills, and enrolment for technical and vocational skills is negligible at the secondary level in SSA. Lower secondary (i.e. grade 6-8) adjusted net enrolment rate in the SSA in 2014 was 66, while total gross secondary enrolment (lower and upper) was 65%. That means that at least a third of all 15-17 year old are not even reaching the upper secondary education; this is important as it is only at that level that vocational education is introduced in any country.

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It is, therefore, not unexpected that vocational education/training (VET) enrolment is extremely limited.

Sub-Saharan Africa has among the lowest number of years of formal education in its older generation. Of course, this data does not account for the alternative modes of learning such as informal apprenticeship, learning on job, and traditional knowledge system providing learning and training opportunities to millions of working-age Africans with little formal, curriculum-based education. In younger cohorts, extensive investment in education has improved vastly the composition of education and skills in the region. As documented in the African Union's recently adopted Continental Education Strategy for Africa 2016–2025, the overall pyramid of African education shows a fairly broad base at 79% adjusted net enrolment in primary school (up from 59% little more than a decade ago) – equivalent to 144 million African school-age children ,who at present access primary education. India has reached primary net enrolment rate of 97% in 2007. However, enrolment at the secondary level in SSA drops to 50%, and only 7% of the young people are enrolled in tertiary education (World Economic Forum, 2017). By comparison, India has a 85% gross enrolment rate at secondary level (classes 9-10) in 2015, and over 25% at tertiary level (Mehrotra, 2016).

If current demographic and education trends continue, the continent's working-age population is set to increase by two-thirds by 2030; from 370 million adults in 2010 to over 600 million in 2030, and the share of this population with at least a secondary education is likely to increase from 36% in 2010 to 52% in 2030. In higher education, enrolment of students in the STEM (Science, Technology, Engineering and Math) lags behind other fields such as economics, business, law and social sciences (AfDB, 2013).

Access to VET is limited in Sub-Saharan Africa, which would be a constraint for projects in infrastructure or manufacturing generally (and especially under the AAGC). In fact, the African Development Bank (AFDB), in its Human Capital Strategy document covering 2014-18 (2013), pointed out that the poor education of workers in Africa is a major impediment to trade, production and competitiveness.

Nevertheless, for those who are a part of the continent's high-skilled white-collar work-force, the data (based on a survey of LinkedIn members) revealed that 35% of LinkedIn's tertiary-educated African members were Business, Administration and Law degree-holders complemented by qualification in law, business management, banking, finance, marketing and human resources. The same data suggests availability of a fairly large science, technology, engineering and mathematics (STEM) and information and communication technology (ICT) talent pool, comprising nearly 40% of the LinkedIn sample, accounting for specialization in Engineering, Manufacturing and Construction (16%), Information and Communication Technologies (11%), and Natural Sciences, Mathematics and Statistics (11%). Within Engineering, Manufacturing and Construction, more than half of the graduates were from electrical, civil, mechanical or chemical engineering, or architecture and urban design. Among those with ICT qualification, the large majority specialized in

computer science or in developing and maintaining information system and databases. A much smaller cohort studied hardware and software engineering, and only a select few were from the field of artificial intelligence. And those specialised in Natural Sciences, Mathematics and Statistics, more than half had studied basic sciences (biology, chemistry or mathematics), while more than one among six were from applied fields such as biochemistry, bioinformatics, neuroscience or environmental science.

The important point is that (as the WEF, 2017 study notes), the education system has not been responsive adequately to skill needs of the labour market. Thus so many university graduates have remained unemployed, while African countries continue to face shortage of skilled labour. The result is that millions of educated young people over decades have migrated abroad. The AAGC needs to help countries stop this migration. Hence, the focus in the AAGC should be on creating jobs for nationals in the corridor projects envisaged, and the technical skill investment need to be according to demand. In other words, *when the detailed project reports (DPRs) for massive infrastructure-industrial corridors are prepared, there will have to be a requirement upon companies mandated to prepare the DPRs to prepare HR development plans – which are specific to the project, and hence must be demand-based.* A supply-driven, donor-financed skill development plan must not be prepared; otherwise it would run a huge risk of wasted resources.

The SSA countries (and AAGC) aim to dramatically expand higher education including technical education, but without concomitant industrial and agricultural development and jobs therein, the millions of new graduates are going to be merely emigration fodder. In other words, what this indicates is that *DPRs are required to perform the function of articulating skills (especially transferable skills and vocational skills) requirements of each project.* [3]

The African Development Bank finds that Africa needs about 4 million more teachers and 1–2 million more health workers. Addressing shortages at all levels is a key development priority for many African countries. Insufficient secondary enrolment (an area in which JAICA is already providing financial assistance to many African countries), particularly in science and technology, constrains efforts to augment access to higher education and TVET and to have teachers needed for quality primary education. Health workers including nurses, midwives, medical technicians, biomedical engineers and experts in e-health and m-health—are also in short supply; this is a result of poor incentives and migration (African Development Bank, 2013).

[3] "Across the continent, substantial potential exists for creating high-value-adding, formal-sector jobs in a number of areas. However, to realize this potential, closer dialogue between education providers and industry is needed to align and optimize the region's demand and supply of skills," said Nicolaas Kruger, Chief Executive Officer of MMI Holdings and Chair of the Africa Skills Initiative (WEF, 2017).

As in global studies on the future of jobs ,which are being impacted by the rapid automation and changes in technology, the key findings from the WEF report (2017), mentioned earlier, based on the new data (including from LinkedIn), are as follows.

- On an average, Sub-Saharan Africa exhibits a high-skilled employment share of just 6% as contrast to a global average of 24%. Only in Nigeria, Namibia and South Africa the share is close to the global average; in no other country in SSA does it get close to 10%. Some of the most common types of higher-skilled employment in the continent include business analysts, school teachers and academics, commercial bankers, accountants, marketing and operation specialists, customer-service specialists, advertising professionals, information technology workers and software and app developers, according to LinkedIn's data.

- Employers across the region identify inadequately skilled work-force as the major constraint to their businesses, including 41% of firms in Tanzania and 30% in Kenya, while others indicate less pressure (9% in South Africa and 6% in Nigeria). However, this pattern may worsen across the region in future. In South Africa alone, 39% of the core skills required across occupations would be wholly different by 2020.

- While it is predicted that 41% of all work activities in South Africa are susceptible to automation, that share is 44% in Ethiopia, 46% in Nigeria and 52% in Kenya. This susceptibility is likely to be moderated by comparatively low labour costs and may be offset by job- creation. Despite this window of opportunity, the region's capacity to adapt to further job disruption is a concern.

- Often this skills instability stems from the fact that many jobs in the region are preferring use of digital technologies. Average ICT intensity of jobs in South Africa has increased by 26% over the last decade, by 6.7% in all formal sector employments in Ghana and 18.4% in Kenya.

- According to the analysis in partnership with LinkedIn, at present trending professions on the continent include creative industries, food technologists, 3D designers, data -centre workers and care, education and health workers. In the longer term, there is strong job-growth potential in hard and soft infrastructure, green jobs, ICT sector and through the new work formats.

- The greatest long-term benefits of ICT intensive jobs in the region are likely to be not in the lower-skilled delivery of digital products or services but in digital design, creation and engineering. To build a pipeline of future skills, Africa's educators should design future-ready curricula encouraging critical thinking, creativity and emotional intelligence as well as should accelerate acquisition of digital and STEM

skills to match the way people would work and collaborate in the Fourth Industrial Revolution.

- The World Economic Forum's Human Capital Index (of 2018), which measures the extent to which countries and economies optimize their human capital through education and skill development and their deployment throughout their life-course, finds that Sub-Saharan Africa, on an average, captures only 55% of its full human capital potential, compared to a global average of 65%, ranging from 67 to 63% in Mauritius, Ghana and South Africa to only 49 to 44% in Mali, Nigeria and Chad.[4]

The data show that, to prepare for the future of work, the region must expand its high-skilled talent pool by developing future-ready curricula with particular emphasis on STEM education; increasing digital fluency and ICT literacy across the population; providing robust and respected technical and vocational education; and by creating a culture of life-long learning, including provision of adult training and upskilling infrastructure.[5] By 2030, the continent's working-age population is set to increase by two-thirds, from 370 million adults in 2010 to over 600 million in 2030. As 15 to 20 million increasingly well-educated young people are expected to join African work-force every year for the next three decades, a delivery ecosystem for quality jobs – and future skills to match – would be imperative for fully leveraging the continent's demographic dividend. The World Economic Forum's analysis also finds that the region's capacity to adapt to the requirements of future jobs—measured by assessing the quality and extent of its education and staff training systems, post-basic education attainment and breadth of skills—relative to the region's exposure to these future trends (measured by assessing the impact of latest technologies, local economic diversification and complexity, employee productivity and unemployment) leave a little space for complacency. While a number of African economies are relatively less exposed to technologically-driven labour market disruptions, this picture is changing rapidly. Urgent efforts for closing the continent's skills gap are a must.

2. Cooperation Scope and Priorities for HRD

Over the last decade, six of the ten fastest-growing economies in the world are from Africa, which are set to double the size of its economy by 2030 if these trends continue. Income levels and complexity of the local economic activity are increasing concurrently from a comparatively low base, including among many of Africa's most populous countries, such

[4] The Africa Skills Initiative is inviting businesses in partnership with government, civil society, and the education and training sectors to make quantifiable commitments to skill, upskill or reskill 1 million people by 2018 and 5 million people by 2020 in Africa, the Middle East and other regions.

[5] "One thing we know about the future of work is that we can't predict all the changes that lay ahead," said Allen Blue, Co-Founder and VP of Product at LinkedIn. "So it's critical that Africa takes advantage of new insights that helps provide a more comprehensive view of trends within its work-force, and develops a network of workers, employers, educators, policy-makers and trainers that is responsive and can adapt quickly to change."

as Nigeria, Ethiopia, South Africa, Tanzania, Kenya and Uganda. South Africa, Mauritius, Senegal and Kenya are the economies of the region with the highest degree of diversification and complexity.

Sectoral priorities for the AAGC partners (in the absence of better sources of skill -gap data) should be driven by the priorities indicated by the African Development Bank in consultation with African governments (AfDB, 2014). The AfDB has identified following five High Priorities for African development.

- Power Africa (electricity)
- Feed Africa (agriculture)
- Industrialize Africa (infrastructure, mining and manufacture)
- Integrate Africa (encourage intra-regional trade) and
- Improve the quality of life for the people of Africa (human resource development, including skills).

There are skill gaps in each of these areas, as has already been indicated. Formal sector unemployment rates are often high—including among recent secondary school and university graduates—in countries as diverse as South Africa, Nigeria, Mozambique and Senegal. While formal sector employment did grow in Sub-Saharan Africa over the past two decades, the job growth was not commensurate with population growth, resulting in fewer opportunities in the formal labour market for many of Africa's young school and university graduates. In addition, a sizeable number of Africans continue to work in an informal economy; on family farms and in urban self-employment – usually the sectors where skills of the newly secondary or tertiary educated are least value-adding, and particularly in rural areas, where they often aspire least to work. Including agriculture, informal employment is 86% of total employment in Africa (including North Africa), and excluding agriculture, it is 72% - both of which are the highest for any region in the world (ILO, 2018). This limited success in capitalizing on its existing education investment is the main cause of the region's relatively poor performance on the Forum's Human Capital Index.

At the same time, a large number of African employers cite inadequately skilled work-force as a major constraint to business expansion. This points to a double bind—mismatch between the number of educated young people seeking jobs and availability of formal, high-quality jobs, and also not having young people adequately trained for such roles. Closer dialogue is required between education providers and industry needs to align and optimize region's demand and supply for skills. The continent's employers and educators need better tools to enable them to have better understanding of new and emerging skills requirement of the labour markets.

Focus on Small and Medium Enterprises for Quality Job Growth and Skilling

Employment in Africa in the formal sector are in smaller-sized firms having limited resources to invest in upskilling and re-skilling. In the poorer economies of the SSA, the share of total employment accounted for by firms (employing less than 20 workers) could be anywhere between 20% and 50% of all workers. However, in Namibia or South Africa, the share was under 10%; in such economies with slightly bigger firms (with 20-99 workers) the share was much bigger (say in the region of 25% of the total employment) than in poorer economies (World Bank database). The share of employees in the enterprises employing more than 250 workers was quite small in South AFrica. Firms which were employing more than 1000 employees, the share was even smaller, except in Lesotho, Malawi, Cameroon, Madagascar, Kenya, Senegal, Gabon, South Africa and Mauritius, where such firms may account for 20% of the total employment. Given that India has considerable experience in supporting SMEs (as does Japan), this is an area of possible support for HRD and skill development that the AAGC partners should focus on in the countries where the economic corridor is to be built.

Potential Growth Sectors for Skill Development: Manufacturing and Infrastructure

Manufacturing production in the sub-Saharan Africa more than doubled during the decade 2004-14 (according to a ODI London report (2016)), dispelling the myth that the sector is in long-term decline. While the share of manufacturing in the GDP had fallen from 19% in 1975 to 11% in 2014, it still grew faster than the global average at a rate of 3.5% annually, from $73 billion in 2005 to $157 billion in 2014. At the same time, manufacturing exports doubled from $50 billion in 2005 to more than $100 billion in 2014, while many countries observed an increase in Foreign Direct Investment (FDI). This process can be strengthened by the Asia-Africa Growth Corridor.

The report highlights that SSA countries are increasingly exporting manufactures to one another, with 34% of the total SSA manufacturing exports in 2014 from 20% in 2005, although countries in Asia have also become much more important destinations. This trend can be strengthened by the AAGC Initiative of India-Japan, which intends to create industrial and infrastructure corridors. In addition to manufactures, infrastructure would be another sector needing skilled people. Between 1998 and 2007, spending on African infrastructure rose at a compound annual rate of 17%—up from $3 billion in 1998 to $12 billion in 2008, significantly outstripping growth of global infrastructure investment. This growth was driven largely by increased funding from non-OECD governments—particularly China's, which provided 77 per cent of it in 2007.

Despite GDP growth, there is unevenness in infrastructure in Africa; behind the unevenness is the huge variation in the size of African economies, economic volatility, political stability, and quality of logistics, health- care and skills. Almost three-quarters of these countries do not have GDP large enough to sustain projects of more than $100 million (a comparatively small budget for, say, a port, an airport, a major road, or a power project). Similarly, quality of roads and

density of populations vary considerably. Fifteen African countries are landlocked, and African transport costs are up to four times higher than those of the developed world, upsetting importation of equipment and materials (AfDB, 2014).

Nevertheless, Indian firms have been investing in infrastructural projects. Ongoing projects are IL&FS Transportation Networks alongside Elsamex SA (a Spanish joint venture) in an Ethiopian road project worth $223 million; and Tata Power's commissioning of two 60MW units at its 12MW Itezhi Tezhi hydropower project in Zambia in February 2017. Energy sector is another focal point for Indian companies for their expansion strategy in the region. Two Indian firms, Bharat Heavy Electrical Ltd and Angelique International Ltd are to build a $128 million hydro-power plant for Zimbabwe Power Company (ZPC) to generate 30 MW of electricity.

While Indian companies are ready to partner with Africa, the poor quality of infrastructure, especially in the rural areas, makes that a difficult proposition. This also affects trade within the region as well as the trade with other nations. In cases of lack of direct physical connectivity, huge costs were incurred by citizens just to get connected to cities within African borders, which affected African business's competitiveness and Africa's attraction as an investment destination. The largest deficit in Africa is in the energy sector, which is acute in low-income countries. Electricity coverage ranges from 68% in the urban areas to only 23% in the rural areas. Power demand is expected to grow at 93% in the next few years (Confederation of Indian Industry, 2017). The next sector in need of attention is roads and railways. Even though roads carry about 80% of goods and 90% of passengers, almost 50% of the roads are still unpaved,; and less than 15% of people have access to all weather roads. There is 84,000 km of rail network but their maintenance and upkeep has suffered and needs urgent attention. There are 64 ports in Africa but the connectivity from them to the hinterland through road and air is inadequate. The ICT sector is growing at about 7% with mobile phone market being the second largest in the world. In the water resources segment, only 60% of African citizens have access to improved water sources and only 28% to improved sanitation; largely owing to the paucity of funds for water and sanitation which clock a dismal 0.1% of GDP (CII, 2017).

Mining

If AAGC is focused on building industrial corridors, it cannot be done without infrastructure, and for its expansion a larger number of skilled people would be required. Here, India-Japan collaboration can be invaluable. Africa's mining sector presents a paradox: although the continent is strongly endowed with mineral resources, mining has not been a consistent engine of economic development, hoped by people in many countries (Mckinsey, 2017). Furthermore, infrastructure constraints often hinder development: many bulk mineral deposits require multibillion-dollar investments in rail and port facilities to allow ore or semi-processed minerals to reach the markets. Such investment decisions are not taken lightly, especially by less stable countries, where the rule of law and security of tenure are not necessarily guaranteed.

Not surprising that of the five largest global diversified mining companies, only one has a major share of its production in Africa. As a result, junior mining companies and major ones focussing on diamonds and precious metals have played a significant role in developing the continent's resources. In recent years, newer players, Chinese and Indian companies, have entered the scene, but a few projects have been developed to the point of production. Observers expect a global demand for Africa's major mined commodities to grow strongly in the next 10 to 20 years to support increased urbanization and infrastructure build-out in China, and emergence of India's middle class. Africa, given its share of global resources, should play a part in meeting that demand.

So mining is another sector in which HRD development would be critical, and the India-Japan collaboration can play a role in Africa. India is a major mining country, with all kinds of major and mining minerals, and hence has plenty of expertise in the field. In recent years, oil production has grown more rapidly in Africa than in any other region. What's more, the oil and gas sector is a foundational element of economic growth for the continent, as 19 African countries are significant producers. This accounts for a significant part of their revenues and represents a prime mover for employment, domestic power development, and, in many cases, infrastructural development (for instance, schools, hospitals, and roads). Production of deep-water oil would continue to grow (in the Gulf of Guinea, for example), while onshore gas and a new-resource development in emerging East African hydrocarbon producers (such as Uganda) are expected to become other main engines for growth (Mckinsey, 2010).

Nigeria has oil reserves of 37.7 billion barrels, and its daily production is 2.2 million barrels per day, and is touted as the largest oil producer in Africa and 11th largest in the world. However, even at their full capacity, Nigeria's four refineries produce only about 10 million litres of petrol while local consumption is 35 million litres per day. Thus, despite good reserves, Nigeria is also bound to import petroleum products. A similar scenario highlights the gas sector as Nigeria's role in global LNG supply has dropped to 7 per cent from 10 per cent in the past, owing to lack of investments. Therefore, India can help Nigeria overcome this constraint by technological support as India also imports oil from Nigeria.

Powering Africa

Countries with an electrification rate of less than 80 per cent of the population consistently suffer from reduced GDP per capita. The only countries that have an electrification rate of less than 80 per cent with GDP per capita greater than $3,500 are those with significant natural resources such as Angola, Botswana, and Gabon. But even they fall well short of economic prosperity. Whether people can access electricity, and if so, how much they are able to consume (consumption) are the two most important metrics indicating the degree to which the power sector supports national development. Intensifying India's ongoing cooperation in Africa in developing renewable energy generation including solar, wind, hydro, geo-thermal and bio-mass along with building power transmission systems would be a natural progression to achieve the targets set forth. India is looking at Africa for growth

in the primary energy sector for its growing economy, and India also needs to diversify its suppliers and energy sources.

Funding in Africa is a key challenge (as noted rightly by CII, 2017). As per the UN estimates, of the 34 of the least developed countries in the globe, 31 heavily indebted countries are in Africa, and in the last three to four years, dampening of oil and commodity prices indicates that private sector investments have reduced significantly. This means the government would have to fill gaps in infrastructure development and the PPP model has to be strengthened. There is also the need for African countries to make their projects "bankable", and given that project preparation capacity is said to be lacking in many Sub Saharan countries, that is why collaboration in project development, knowledge-sharing and financial partnerships with countries like India become critical and crucial, more so for attracting private investment. The India-Japan initiative can help build these capacities, as India in particular has developed considerable expertise in the area. Japan has already proposed to strengthen cooperation in this sector between Japan and India, which are big importers of LNG.

3. India's Trade and Investment in Africa

The trends in India-Africa trade relations are strong. Bilateral trade has risen around five-fold from US$ 11.9 billion in 2005-06 to US$ 56.7 billion in 2015-16. The rapid growth in bilateral trade is as both Indian and African governments have systematically brought down barriers to seamless trade flows by dismantling various tariff and non-tariff barriers. India has steadily opened up its markets to African exports. Africa's trade surplus with India has increased rapidly, albeit driven in large part by a narrow range of suppliers and commodities. At present, India's exports to Africa have increased almost four-fold from US$ 7 billion in 2005-06 to US$ 25 billion in 2015-16, thereby accounting for 9.5 per cent share in India's total exports. India's imports from Africa, on the other hand, have increased by nearly seven-fold from US$ 4.9 billion in 2005-06 to US$ 31.7 billion in 2015-16, thereby accounting for 8.3 per cent share in India's total imports. As a result, India's trade deficit with Africa stood at US$ 6.6 billion in 2015-16, from a surplus of US$ 2.1 billion in 2005-06 (CII, 2017).

There is a clear policy direction in India to expand ties with Africa. To enhance India's trade with Africa, the Government of India had launched an integrated programme 'Focus Africa' from the year 2002-03. The main objective of the programme was to increase interactions between two regions by identifying areas of bilateral trade and investment. The 'Focus Africa' programme has been extended to cover entire African continent. Many African nations have also benefited from India's Duty Free Tariff Preference scheme for the LDCs, which were implemented in 2008.

African countries are receiving strong investment interest from India due to their high-growth markets and mineral rich reserves. In fact, India is one of the largest investors in Africa. As per the FDI markets database, India was the fifth largest country investing in Africa, after the USA, UK, France and UAE; with manufacturing activities accounting for

more than half of the FDI inflows from Africa to India. Indian Multi-National Enterprises (MNEs) have ventured into both greenfield and brownfield investments, spanning telecommunications, energy, computer services, power and automobile sector among others. A large proportion of Indian FDI has also gone into the infrastructure sector in Africa. Several of these investments are actually tied to the investments made in the extraction sector. In other cases, Indian construction and telecommunication companies have made investments in Africa to build roads, ports and telecommunication networks in several African countries. Apart from these, market seeking FDI from India is also present in Africa. Several auto industry majors like Tata Motors and Mahindra and Mahindra have investments in Africa.

Broadly Indian investments in Africa are predominantly resource-seeking, though market - seeking and efficiency-seeking investments are also present. With a view to facilitate and further enhance bilateral trade and commercial relations with countries in Africa, India has rightly placed important policy measures as also institutional frameworks to create an enabling trade and business environment. Major policy initiatives and institutional frameworks include, among others, Focus Africa Programme, India's Duty Free Tariff Preference (DFTP-LDC) Scheme for Least Developed Countries, Pan-African E-Network; India and Pan-African Countries Initiative, IBSA Initiative, Inter-bank cooperation among BRICS members, and India-Africa Forum Summit.

4. Recommendations for Human Resources for Infrastructure Development

In the foregoing paras, a number of sectors in Africa have been identified where growth prospects are high, where HRD for industrial corridors promoted under the AAGC would be necessary. Apart from infrastructure (ports, airports, roads, energy plants) the other identified sectors are manufacturing, mining, and oil production & gas sectors. The objective here would be to create manufacturing centres backed by appropriate human resource development for increasing value- addition (for mining, oil, gas) within the relevant African countries, partly for domestic consumption and partly for export.

The African Development Bank (AfDB) Human Capital Strategy (2014-18) indicates that to support its rapidly changing political and socio-economic development, Africa needs to build skills in traditional professions (teachers, nurses, doctors) and in STEM. What is important is that the AAGC Initiative of India-Japan should be able to support African countries in meeting those needs.

The AfDB’s Human Capital Strategy has its main area of focus on skills and technology.

India’s strengths in HRD for Africa

India's unique selling property while offering technical assistance to other developing countries derives from multiple sources. India has had a long history of providing technical assistance in human resources development to a large number of African countries through

its International Technical and Economic Cooperation programme under which full financing is provided to staff and students to train in India's higher education system. Till date, over 24,000 scholarships across 300 training courses conducted at 60 training institutions have been utilized by African nationals in IT, renewable energy, agriculture, marine and aeronautical engineering, marine hydrography, SME entrepreneurship, rural development, parliamentary affairs, logistics and management, climate change adaptation, disaster management, cyber security, forensic sciences, and defence and security, among others.

So far, Tele-Education services provided by different Indian Universities such as Indira Gandhi National Open University (IGNOU), New Delhi, University of Madras, Chennai, University of Delhi, New Delhi, Birla Institute of Technology and Science (BITS), Pilani, and AMITY University, NOIDA, are examples where success has been achieved through persistent policy alignments. Tele-medicine is another area with huge success in implementation, and where Indian super specialty hospitals such as All -India Institute of Medical Sciences (A.I.I.M.S.), Delhi, ESCORTS Heart Institute and Research Center, New Delhi, Moolchand Hospital, New Delhi, Fortis Hospital, NOIDA, Apollo Hospital, Chennai, Sri Ramchandra Medical College and Hospital, Chennai, Narayana Hrudayalaya, , Health Care Global Enterprises, Bangalore, CARE Hospitals, Hyderabad, Amrita Institute of Medical Sciences (AIMS), Kochi, Dr Balabhai Nanavati Hospital, Mumbai, and Sanjay Gandhi PGI, Lucknow, are involved in providing products and services to African gentry.

The most visible impact has been felt in the areas of telemedicine and tele-education, as Africans living thousands of miles away have had direct access to top educational institutions and super-specialty hospitals in India. These projects are worth $125 million. Under the tele-education component of the network, more than 2000 students from Africa have been enrolled in five top- ranking universities in India in a host of disciplines. Live sessions with Indian experts were a tremendous success with the youth in Africa.

Tele-medical consultations have also been started between African doctors and Indian specialists. Encouraged by African response, India has even offered training at the regional level by conducting workshops in tele-medicine and tele-education modules for optimizing benefits of the project. Blending technology with social transformation, the PAeN project showcases creative possibilities of how ICT can become a catalyst in ensuring lasting positive socio-economic changes. A knowledge-driven society in Africa could be a potential game-changer for the global economy. Pan-African training centres across locations in India and Africa are being worked upon in consultation with the African Union demonstrating the broader paradigm of South-South Cooperation.

Together with Japan, this capacity for providing training and vocational education by India has to be leveraged for Africa's benefit by creating centres of excellence and pre-employment training institutions in African countries. In addition staff for infrastructure and industry corridors envisaged under the AAGC can be trained in Indian companies as well as in Japanese companies operating out of India. One problem that besets most

developing countries' skill development systems is that government institutions are main providers of such trainings, which inevitably remain supply driven. However under the Asia Africa Growth Corridor initiative, human resource development would be aligned to development of industry corridors, and hence would be demand- driven rather than supply-driven. This would ensure that the traditional old model of training in most developing countries would be aligned to a training model adopted in Japan and East Asian countries, which are industry-led and demand-driven.

The AAGC emphasizes on the development and deepening of value- chains. Skill requirements can evolve dynamically with the pace of such value- chains in Asia and Africa sub-regions. It entails that the whole process of skill development may undergo a paradigm shift requiring firms, which are building infrastructure or setting up manufacturing facilities for value- addition in Africa, shall set aside funds to create in-house, in-firm enterprise-based vocational training facilities. This is a normal practice in Japan, but to a much lesser extent among Indian firms, except for largest Indian corporates. To the extent that large Indian corporates are investing in Africa, they would need to factor in enterprise-based training infrastructure as well as human resource (i.e. instructors), who would conduct in-house training. Such training would necessarily be demand-based.

Japan's Strengths in HRD for Africa

Japan has long standing commitment to human resource development in Africa through the work of the JAICA. The same applies to Japan's HRD support to India based on the request from Japanese companies. Japan's Ministry of Trade and Industry(METI)supports training for employees working at the Japanese companies in developing countries. The trainees maybe skilled in the following areas: 1. basic Japanese manufacturing spirit included Kaizen and 5S; 2. practical technical skills; 3. design and product development skills; and finally, 4. management and planning skills. Such training programmes would require sending experts to the local area training in Japan itself.

In the case of the India-Japan initiative in Africa, there is potential for using ongoing project in India called Manufacturing Skill Transfer Promotion program (MOU of November 2016). In accordance with this, a Japan-India Institute for Manufacturing is in the process of being set- up, and this may indeed become the base for Japanese training for African industrial and infrastructure corridors. The METI is already supporting training for African employees in productivity promotion in Africa through the Japan Productivity Council. This involves staff training in productivity promotion through the Japan Productivity Centre. It is also involved in sending experts to strengthen ability of staff and provide on job training on 5S and Kaizen in South Africa, Kenya, Nigeria and neighbouring countries. These activities can very well be expanded further under the AAGC initiative.

In addition, it should be noted that the secondary school system in most African countries is in need of improving mathematics and science education. JAICA has long been providing

assistance in math and science education, designed for children to acquire basic skills. This activity could also be dovetailed with HRD for industrial corridors.

Specific Recommendations on Modalities for Skill Development

Skill Institution Building in Africa by India

Pre-employment training institutions are lacking in the SSA. Three modalities of skill training centres are recommended.

Industrial Training Institutes – Public and Private.

India had started to develop its ITIs in early 1960s, which offered training to 10th class graduates in trades that would offer employability in manufacturing and non-manufacturing industrial sectors. The training lasts for a minimum of two years, but in certain trades may extend to 3-4 years. In 2015, there were approximately 2000 government-owned and managed ITIs, which have grown in number. In addition, in 2007 there were under 2,000 private ITIs, which have grown to 12 000, on account of growing demand. India can offer technical support in how to go about creating such centres, both in the African public or private sectors. The loans extended by the Indian government to African governments can be utilized to finance such ITIs in Africa.

Vocational Education in Schools.

As stated above, a very small share of secondary schools offer vocational education in the SSA. However, India has been growing its capacity for providing Vocational Education in the service sectors in India's government secondary school system from class 9 onwards. This has grown rapidly since 2014, and thus India should be able to provide government-to-government support to African governments for this.

The National Skill Development Corporation (NSDC) in India since 2011 has been providing loans and equity to private vocational training providers to set- up training facilities, while attempting to regulate such providers. This model can be offered to African countries, while taking into consideration pitfalls of the Indian model.

1. The WEF, 2017 study indicated that the education system in the SSA has not been adequately responsive to skill needs of the labour market. So, many university graduates remained unemployed, while African countries have continued to face shortages of skilled labour. The result is that millions of educated young people over the decades have migrated abroad. The AAGC needs to override over this problem. Hence, the focus in AAGC should be on ensuring the projects provide for technical skill investment, or for demand-based HRD. In other words, *when the detailed project reports (DPRs) for massive infrastructure-industrial corridors are developed, there will have to be a requirement upon companies mandated to prepare the DPRs to prepare HR development plans – which are specific to the project, and hence must be demand-based.* A supply-driven, donor-financed skill

development plan must not be prepared; otherwise it would run a huge risk of wasted resources.

2. Sectors that need skill development emphasis in the SSA are as follows. Investment in specialist skills and local talents in building and construction trades due to rapid urbanization and a continent-wide need for infrastructure development is one obvious example. Additional demand for specialist skills and local talents in consumer industries such as agriculture, food and beverages, home and personal care, apparel and transport and automotive, expanding rapidly due to the region's growing population, is another. As the Fourth Industrial Revolution unfolds, Sub-Saharan Africa is also poised to develop new business models on the basis of these technologies. Innovations such as mobile payment systems like M-Pesa in financial services, the use of drones for last mile delivery in transportation and logistics and development of a wide range of digital applications tailored to Africa's continued importance and unique strengths in agriculture point to growth of these new aspects in the region's economy. At the same time, much as in more economically advanced world regions, concerns have recently been raised regarding potential impact of automation on jobs on the continent. It has been estimated from a technological standpoint that 41% of all work activities in South Africa are susceptible to automation, as 44% in Ethiopia, 46% in Nigeria, 48% in Mauritius, 52% in Kenya and 53% in Angola. However, these effects are likely to be moderated by comparatively lower wages and slower technology adoption.

3. Future job growth would not be limited to the technology sector alone. Investments in Sub-Saharan Africa's enormous infrastructure needs such as improvements in the continent's transport networks are booming. While the potential benefits of such "hard" infrastructure investments are well-recognized, economists predict equivalent or greater – often untapped – job creation potential of investments in countries' "soft" infrastructure of child-care, elder-care and education, which also often produce more gender-balanced labour market outcomes. For example, the direct and indirect job creation effects of an investment of 2% of GDP in South Africa would amount to 511,000 jobs in construction (with 29.6% of direct jobs going to women) and 414,000 jobs in care (with 61.4% of direct jobs going to women). Investing in care economy also dovetails with recognized importance of early-childhood education for human capital development. In addition, millions of new teachers would also be needed across the continent.

4. The transition to a more ecologically sustainable economic model also has the potential to create millions of new jobs globally, including in Sub-Saharan Africa. For example, it is estimated that by 2025 South Africa alone can create 462,000 additional jobs by "going green", including in clean energy generation, energy efficiency, pollution control and natural resource management. Similar estimates exist for countries such as Mauritius, Namibia, Kenya, Senegal, Uganda and Zambia.

5. Finally, regardless of sector or occupation, new work formats are offering individuals and entrepreneurs new opportunities. Online platform work is on the rise globally, including in Sub-Saharan Africa. For example, the continent currently has 56 e-ridesharing services, most of them are home-grown apps launched over last three years. In Africa, online talent platforms have the potential to create significant benefits by moving people from informal to formal jobs, by increasing work-force participation and hours worked of those formerly underemployed or inactive, by shortening duration of job searches and by enabling matches that would otherwise not have happened. By 2025, this can result in 536,000 additional full-time equivalent jobs and a US$3bn increase in GDP in Kenya, 861,000 jobs and US$20bn in South Africa, and 1.9 million jobs and US$20bn additional GDP in Nigeria.25 As elsewhere, African companies would increasingly need to learn to manage a distributed, virtual work-force to integrate virtual freelance workers and to mitigate challenges for engaging in online work.

6. Despite particular concentrations of Engineering, Manufacturing and Construction specializations in the architecture, engineering and energy sectors and of ICT specializations in software industry, strong demand for STEM and ICT skills exists across a wide range of industries in of Africa. A second promising approach for policy-makers, businesses, educators and workers to understand the unfolding employment landscape consists of tracking growing and declining share of specific job functions and particular professions on the basis of data from professional networking sites and online job adverts. WEF (2017) provides one such picture for Africa through research partnership with LinkedIn, indicating growing shares of job functions broadly in the fields of business development, education, entrepreneurship, media and communications and marketing, among others. Reviewing detailed matching data for particular professions gives upward trends in professions such as creative industries, food technologists, 3D designers, data centre workers and care, education and health workers. Such data, while limited to those who have digital access and often available for the high- and medium-skilled white collar work-force only, holds strong potential over time for improving forecasts and planning for specific skills, occupations, sectors and geographies.

7. While two-way trade and investment ties between India and Africa have deepened, the future potential is much higher. The focus is shifting towards *creating value-chains and investment-led trade*. The Indian private sector has the potential to further deepen its economic footprint in African nations, especially in manufacturing sector. Under the aegis of the NEPAD [New Partnership for Africa's Development] along with providing financial aid and extended lines of credit, innovative financing mechanisms for manufacturing sector in Africa are being explored for specific High 5 sectors identified by the African Development Bank. At present, Africa's exports of intermediate goods are dominated by mining products and resource-based manufactures such as basic metals or chemicals and

fuels; this is consistent with a forward integration into global value chains, but merely as exporter of raw materials and other intermediates embodying limited value -addition. Despite its limited size, intra-African trade in intermediates is significantly more diversified than the corresponding trade with the rest of the world. The scope for the incipient emergence of regional value chains, particularly in the manufacturing sector, is, however, still largely untapped due to an array of structural and policy constraints.

8. Reliable and timely data on the structure of employment and skills in the Sub-Saharan Africa is difficult to obtain. There is scarce information on the number of existing jobs, of newly created jobs, and of unfilled vacancies in specific sectors, undermining efforts to systematically assess and develop continent's skills base. Nevertheless, initiatives aimed at closing skills gaps can only be effective if they are not hampered by data gaps.

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