Resilient Human Capital: A Precondition for Structural Transformation

by

Adrian Gauci and Chrystelle Tsafack Temah[1]

Abstract

This paper seeks to demonstrate that the education output in its current state does not allow building a resilient human capital in African Least Developed Countries (LDCs). African LDCs are characterized by structural handicaps, including their low level of human capital that prevents them for attaining internationally agreed goals and poverty reduction. Moreover, their moderately good economic growth performance has not resulted in a commensurate reduction in poverty, mostly due to lack of employment opportunities. While the reasons for this low employment creation are diverse and stem from the nature of growth itself (demand side of labour market), on the supply side the mismatch between education profiles and demand by the formal and informal labour market is an important driver. Indeed, the level, quality and content of the predominately primary school output do not meet the requirements of a labour market. Using primary and secondary data on employment in Ethiopia this paper shows that numeracy and literacy skills are not sufficient for employment opportunities and reinforce overall vulnerability. A comparison with Southern Asian economies is also used to determine a threshold of education (level and quality) that is necessary to improve the employability of labour force. Our results suggest that the shift from an incremental schooling model to an instrumental model in the curriculum that allows problem solving and cognitive development is vital in strengthening human capital resilience contributing to overall resilience in African LDCs. In turn, a more resilient human capital status is a necessary and sufficient condition for structural transformation of LDCs economies.

Keywords: *LDCs, vulnerability, employability, human capital, curriculum.*

[1] The authors are Economic Affairs Officers with the UNECA, MDGs/LDCs Section of the Economic Development and NEPAD Division. E-mail Address: agauci@uneca.org; ctsafack@uneca.org

1. Introduction

African Least Developed Countries (LDCs) are recognized and classified as those countries suffering from severe handicaps to development and vulnerable to exogenous shocks. As recognition of their structural vulnerability, the international community has agreed on a new Programme of Action to monitor the progress of the LDCs toward their graduation out of this category.

African LDCs have registered moderately good economic growth during this last decade but this has not resulted in a commensurate reduction in poverty, mostly due to lack of employment opportunities. While the reasons for this low employment creation are diverse and stem from the nature of growth itself (demand side of labour market), on the supply side the mismatch between education profiles and demand by the formal and informal labour market is an important driver.

The level, quality and content of the predominately primary school output do not meet the requirements of a labour market characterized by knowledge as one of the drivers of growth. This has recognized in both the Istanbul Programme of Action and the Human Asset Index that attest to the central role of education in development. The Istanbul Programme of Action for Least Developed Countries (LDCs), unlike the previous two programmes, reflects a paradigm shift of interventions that assist LDCs from monitoring their performance to exiting their vulnerable category. The specific Human and Social Development Commitment highlights the role of education in developing LDCs productive capacities and structurally transforming their economies. This is also mirrored in the Human Asset Index that identifies secondary education as key in building resilience towards exogenous shocks.

Most of the African LDCs have made significant progress towards primary enrolment without a commensurate increase in completion rates. The focus on primary education in African LDCs was also driven by the Millennium Decvelopment Goals (MDGs). The quality aspects plausibly gauged by completion rates and adequate teacher supply among other factors, determined a mismatch on a technological and knowledge based labour demand, hence contributing to a lower level of development. This is portrayed in the Ethiopian case study wherein survivalist employment and the informal sector are the outcomes of educational policies in African LDCs.

The East Asian countries successful transformation over the last fourty years with education as the kernel of development provides some useful insights on public policies and institutions arrangements for African LDCs as they strive for structural transformation and exiting their category.

This paper takes cognizance of past studies of the relationship between human capital and growth. In African LDCs this moderate economic growth was not commensurate to a reduction in poverty or a successful transformation from a vulnerable state. This paper attempts to add to this literature through identifying the type(level) of education that is a precursor to structural transformation and development. It does so through an appraisal of the East Asian economic history of the link between education and structural transformation. This paper also analyses a Ethiopian case study of informal entrepreneurs wherein survivalist employment and the informal sector are the outcomes of inadequate educational policies. This provides some insight into the educational policies necessary for African LDCs to exit their vulnerable status.

This paper is so structured with Section I a literature review of the link between human capital and growth. This is followed by Section II that analyses African LDC economic growth and its drivers. Section III provides a framework for the analysis of level of education and structural transformation including the Human Asset Index reviewing the East Asian experience and what African LDCs can elicit in this regard and the Ethiopian case study while Section IV discusses The paper concludes with some policy considerations.

2. **Section 1:** Literature Review

In this section we will present a brief overview of the literature on human capital and growth. We also outline the economic theory before turning to empirical work.

The early growth literature can be traced back to the 1950s in which neoclassical growth theory explained persistent growth in output through exogenous technological progress. The most important contribution to growth theory of this time is no doubt Solow (1956) who assumed that in its basic form, the economy can be described by a Cobb-Douglas production and a model characterised by key variables such as savings, the population growth rate and technological progress.

Paul Romer's approach to human capital differs somewhat from the above model: he assumes that education is split into two main components - knowledge and human capital (1990). Generation of knowledge is different from human capital in

the sense that it is understood as a technological process and is hence similar to the technological progress of the neoclassical growth models . It is a non-rival good which can be accumulated without limits and in addition, generates spillovers: once a person generates knowledge, everyone has access to it, leading to a spiral effect. He calls the product of knowledge created through R&D 'designs.' Human capital is understood to encompass human abilities, which are either used in the production process. Human capital *is* rival, thus it can be obtained privately and can be sold on the market (in the form of labour). The higher the overall level of knowledge, the more productive research is and – the more human capital that is used in research, the more numerous are the designs.

Hence, one can see an interesting implication of Romer's model: growth depends positively on the stock of human capital. If human capital is very productive in R&D, the growth rate will be higher. This implies that a country with more human capital than another will grow at a faster rate. In addition, due to the spillovers from R&D, it would be socially optimal to actively promote R&D.

Having presented two important models dealing with education and its effect on growth, we turn to its relationship to education.

Human capital and education

There have of course been several studies on the effects of education on growth in Africa (see Freeman & Lindauer (1999) for an excellent overview). The main message seems to be that increased investment in education may be a necessary, yet by no means a sufficient condition to obtain higher growth on the African continent. This is both encouraging as well as disappointing. For one, it suggests that the strive for (primary) education may have been misplaced in terms of the expected effects on growth. However, it also suggests (Glewwe 1991) that returns to education are convex in Africa – resulting in high(er) returns on secondary and tertiary education than for primary education (see Bennell, 1996), which may provide impetus for increased focus on higher levels of education than was so far the case.

This whist questioning the policy relevance Psacharopoulos (1987) with its emphasis on primary education and higher social rates of return, the focus has shifted today rather to the term "human capital" than "education": education must be seen as a process of human capital building – and hence a subset of human capital. Whereas 'education' primarily only encompasses formal learning, i.e. primary, secondary and tertiary education, human capital is broader, allowing for a more general treatment such as "learning-by-doing", R&D etc.

This shift in emphasis may be in part due to the disappointing statistical evidence linking education to growth. In fact, it now seems intuitive that whereas providing

basic education to citizens brings manifold social benefits, increased growth is not necessarily one of them. Hence, basic education is likely to increase health-awareness, to foster the evolution of democratisation, to reduce fertility, etc. Yet, *basic* education does not necessarily provide the required tools to make innovative advancements in technology, adapt new ideas and create new designs and in general insufficient for structural transformation.

There is a large empirical literature investigating issues of human capital and growth. One of the problems with e.g. the above models on human capital is that the authors are not too precise on what kind of human capital they consider relevant, nor are they specific as to the characteristics of human capital.

However, this paper will only focus here in the empirical literature using education as an indicator. Indeed, education has frequently been used as an indicator for human capital. This is in part due to the fact that indicators on education are to a large extent readily available whereas other indicators that could measure human capital may be more difficult to come by.

Therefore, in this section we will give a brief overview of some select articles on the relationship between education and growth. Of course, when dealing with education, one has to specify how education is measured: investment can either take place in the form of a time investment (individuals spend a proportion of their life accumulating human capital) or it can be a monetary investment (e.g. public expenditure on education). Different approaches have been used in the literature. Proxies ranging from literacy rates to enrolment rates to expenditure on education are commonly found.

Benhabib & Spiegel (1994) look at stocks of past education attainment to explain growth. In their paper, growth rates of input factors are related to the growth rate of per-capita GDP. Benhabib and Spiegel discuss the influence of human capital on production and base their argumentation on Nelson & Phelps (1966) and come to the conclusion that human capital should not be treated as a usual factor of production. Rather, human capital influences per capita GDP through two channels – on the one hand, the technology of a country will grow at a certain rate, depending on human capital, on the other hand, countries that have sufficient knowledge find it easier to import ideas and technologies from abroad, hence will thus be able to catch up with the rest of the world. Human capital is hence not a classical factor of production, but a factor that only affects output through technology. Therefore, although human capital is uncorrelated to growth using the Augmented Solow model, the effect of past education attainment levels on the current growth rate is significant if they use the Nelson-Phelps approach in assuming that growth is positively affected by the rate of technological innovations and the rate of diffusion or adoption of existing innovations and the stock of human capital affects both these rates.

Barro & Sala-I-Martin (1995) show that education attainment is significantly correlated with growth, however, if education attainment is decomposed, the effect of primary education is insignificant. They also show that the effect of public expenditure on education has a significant effect.

Barro (1998) analysed the determinants of economic growth in a panel of around 100 countries observed from 1960 to 1995. In this study, he found that growth is positively related to the starting level of average years of school attainment of adult males at the secondary and higher levels.

Levine & Renelt (1992) also look at education and growth – in particular, they measure schooling by using enrolment rates and find that secondary school enrolment rates are positively correlated to growth if other variables are not included. However, including other economic indicators, e.g. measures of openness and political stability render the coefficients of secondary enrolment rates insignificant.

Finally, Stokey (1994) comes to an interesting conclusion looking at Barro & Lee (1993) who find that whereas education of males has a positive effect on growth, education in general has a negative effect.

The literature does point out a number of aspects. Educational impact on growth is not direct but through the channels of its link to technology and innovation. Regarding the level of education, there seems to be some empirically founded consensus on post-primary education having a positive effect on growth if channelled through technological innovations. This is also borne out by African country case studies that demonstrate that higher education has higher rates of return (Nielsen & Nielsen 2001; Siphambe 2000).

In terms of African LDCs the specification of their defining vulnerability gauged through an Economic Vulnerability Index and a Human Asset Index does consider post-primary education as an important component of education. The preponderance of primary school production in African LDCs more in line with the MDGs has not assisted adequately the growth process and the development agenda to exit the LDC status.

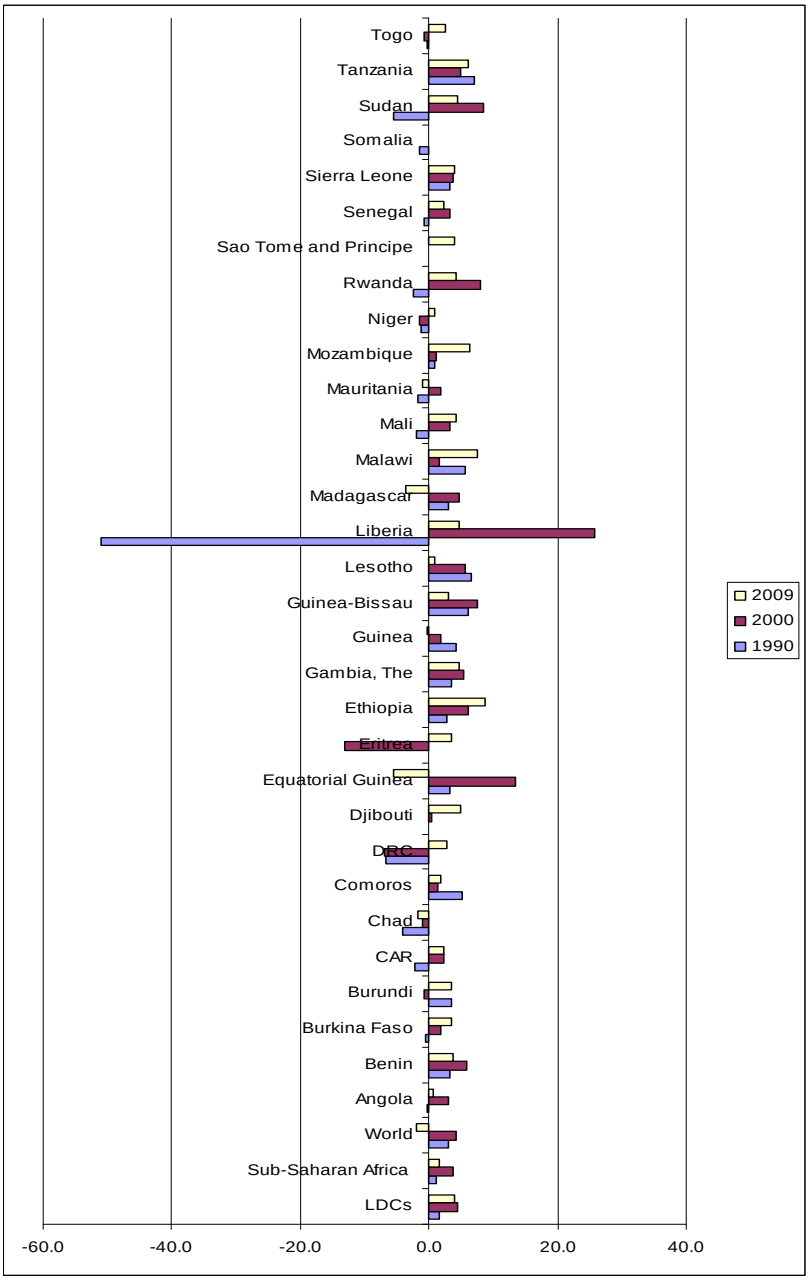
3. Recent history of economic growth and drivers in African LDCs

Most African LDCs showed increase in annual GDP growth between 1990 and 2009 except Comoros, Guinea, Guinea-Bissau, Lesotho, Madagascar and Tanzania that showed a decline over the same period (see Figure 1). However, most of the African LDCs registered a decline in annual GDP growth between

2007 and 2009 except Comoros, Eritrea, Guinea Bissau, Malawi, Mauritania and Togo.

As GDP growth rate in 2009 has been most likely affected by the international financial food and fuel crisis, it does not appropriately depict the long-term growth trend of African LDCs economies but does confirm the vulnerability to exogenous shocks. Indeed, available data for a period between 1990 and 2008 would provide a more faithful picture of these economies. Indeed, Radelet (2010) showed that 15 African LDCs recorded an impressive GDP growth between 1996 and 2008.

Figure 1: GDP growth in African LDCs, 1990, 2000 and 2009.



Source: World Bank world development indicators

Table 1 below shows that the average real income in these emerging countries in Africa cumulatively increased by more than half in Ethiopia, Rwanda and Uganda. The average real income even almost doubled in Mozambique.

Table 1: Growth rate in selected African LDCs during 1996-2008

Country	Annual Income growth per capita, 1996-2008	Cumulative Increase in Average Real Income, 1996-2008
Benin	1.3	18
Burkina-Faso	2.8	43
Ethiopia	4.1	65
Lesotho	2.3	33
Liberia	3.1	13
Malawi	1.2	15
Mali	2.5	37
Mozambique	5.3	96
Rwanda	3.7	60
Sao Tomé and Principe	5.0	40
Senegal	1.4	20
Sierra Leone	3.7	24
Tanzania	3.0	46
Uganda	3.8	61
Zambia	1.8	25

Source: Radelet, 2010.

As impressive as the performance of African LDCs in term of economic growth can appear, ILO (2011) analyzed it as 'high and volatile'. It is mainly due to an export price-led investment boom in commodities, but with manufacturing stagnating.

Table 2 below shows that the primary sector still accounts for a large share of the GDP in African LDCs. On average, the share of the primary sector in the GDP is 40 percent in these countries, with a few exceptions like Djibouti (3.9 percent). Meanwhile, the share of manufacturing in these countries is very low, at 8.7 percent on average of the GDP. These figures are especially worrisome, since productivity and job's creation in African primary (especially agricultural sector) are not dynamic enough to satisfy the jobs' demands generated by the population growth.

Table 2: Contribution of the primary and manufacturing sectors to GDP in African LDCs, 2009-2010.

Country	Share of primary sector in the GDP	Share of the manufacturing sector in the GDP
Angola	55.1	6.5

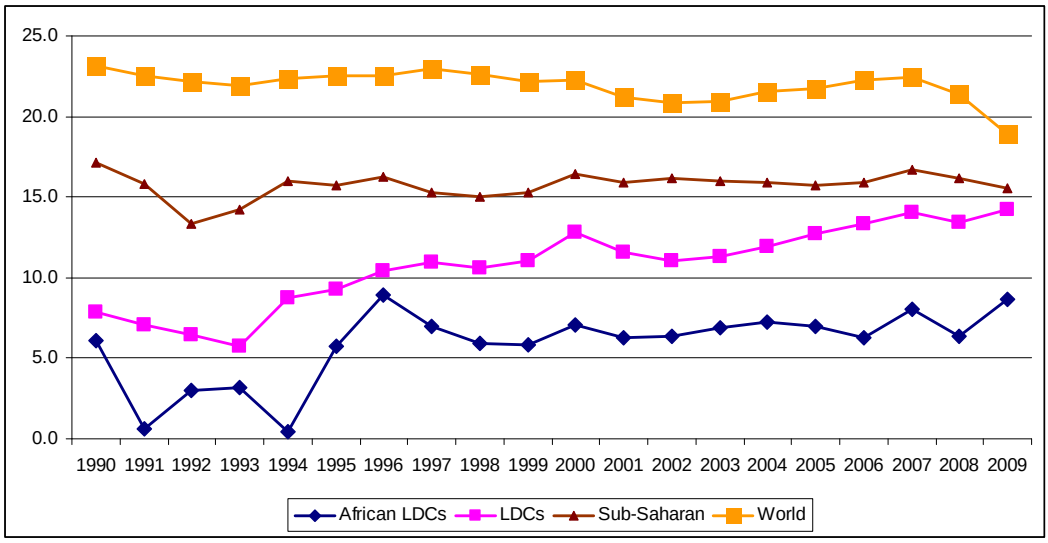
Benin	36.2	8
Burkina Faso	40.5	9.9
Burundi	44.6	7.1
Central African Republic	56.6	6.8
Chad	58.1	5.8
Comoros	44.7	3.9
Democratic Republic of the Congo	54.5	5
Djibouti	4.1	2.4
Ethiopia	43.6	4.9
Gambia	35.4	4.6
Guinea	47.6	6.2
Guinea-Bissau	42.5	11.4
Lesotho	15.9	18
Liberia	63.8	5.3
Madagascar	29	14.7
Malawi	33.8	10.7
Mali	46.6	5.7
Mauritania	45.4	4.1
Mozambique	30.9	14.1
Niger	49.8	5.5
Rwanda	36.5	6.7
Sao Tome and Principe	17.7	6.7
Senegal	18.5	13.8
Sierra Leone	53.6	2.5
Sudan	51.3	
Tanzania	32.5	9.5
Togo	45.9	7.9
Uganda	25.1	8.2
Zambia	22.2	9.3

Source: African Economic Outlook 2011, country notes (OECD, AfDB, ECA and UNDP)

The explanation of the paradox of the jobless growth lies precisely within the weakness of the secondary sector and the stagnation of manufacturing. Stimulating the secondary sector would require a dynamic industrial policy, with sound investment. Yet, the savings necessary to finance this investment, though increasing is still low in African LDCs, as compared to the other regions, as demonstrated in Figure 2. Gross domestic saving stagnated between 1997 and 2005 in African LDCs and started increasing only since 2005. While this trend is

similar to the LDCs over all, the gross domestic savings rate in African LDCs is much lower than the regional average, which itself is less than the world average.

Figure 2: Gross domestic saving in African LDCs and other regions



Source: World Bank world development indicators
Note: Weighted average for African LDCs with available data

As explained by Boateng (2002), there is a weak linkage between the education sector and the labour market in Africa. Boateng further emphasized that this weak linkage isolates the education sector from the real sector, resulting in a weak impact of educational output on the growth and development of the economy. On the other hand, it is acknowledged that the more fundamental cause for the low returns to education in Africa, including in African LDCs is the continuing failure to subject the educational sector to the requirements of the labour market. Thus the informal sector becomes the labour absorption market of a skill mismatch.

Technical and vocational education and training (TVET) is increasingly emerging as one of the most effective human resource development strategies that African countries, including LDCs need to embrace in order to train and modernize their technical workforce for rapid industrialization. As highlighted in a technical paper by ILO (2011), empirical evidence from successful catching-up countries show that educational transformation precedes accelerated productive transformation, meaning that capabilities are an important condition for productive transformation. Since one of the most important features of TVET its orientation towards the world of work and the emphasis of the curriculum on the acquisition

of employable skills, its delivery systems are therefore well placed to train the skilled and entrepreneurial workforce needed by LDCs for their structural transformation. Afeti (2009) emphasizes that in order for TVET to effectively support industrialization in African countries skills training must be of high quality and competency-based, incorporate the use of modern information and communication technologies, be relevant to the needs of industry, efficient, and adaptable to the changing technological work environment.

However, increasing the average number of schooling years or/and adapting the curriculum to include TVET are not sufficient. As evidenced by ILO (*ibid*), all successful catching-up countries have also had some type of industrial policy, with a smart mix of incentives and sticks to prevent rent-seeking, and have nurtured infant industries. The use and upgrade of the informal apprenticeship system has also made an important contribution to enhance capabilities.

4. Framework

In this section, we first present education component of the human asset index and describe its evolution in African LDCs. Then we present the example of Ethiopia to illustrate the limits in terms of employment creation and poverty reduction through an inadequate attention to level and quality of educational policies, while the East Asian countries exemplify human resource led development.

Human Asset index in African LDCs: The human assets index (HAI) is a criterion for identification of LDCs. It provides information regarding the level of development of human capital of a country. It is a combination of four indicators; two indicators of health and nutrition (the percentage of population undernourished and the mortality rate for children aged five years or under) and, two for education (the gross secondary school enrolment ratio and the adult literacy rate).

Primary enrolment has improved sharply in African countries, including LDCs during the last decade (2000-2010). However, there are two limits to this substantial increase. First, the progress in terms of access to primary education has often been at the expenses of the quality, in terms of both the ratio of pupils to teacher ratio and the completion rate. Second, this increase has not been sustained until the secondary level. As shown in Table 3, gross enrolment rates are much lower than primary enrolment rates, both for male and female in all LDCs.

Table 3: Gross enrolment rates in African LDCs for primary and secondary levels, 2005-2009

Country	Gross Primary enrolment ratio, male	Gross Primary enrolment ratio, female	Gross Secondary enrolment ratio, male	Gross Secondary enrolment ratio, female
Angola	141	114	19	16
Benin	125	108	46	26
Burkina Faso	83	74	23	17
Burundi	139	132	21	15
Central African Rep	104	74	18	10
Chad	97	68	26	12
Comoros			52	39
Djibouti	49	43	35	24
Eritrea	57	47	36	25
Ethiopia	103	92	39	28
Gambia	84	89	52	49
Guinea	97	83	45	26
Lesotho	108	107	34	45
Liberia	96	86	36	27
Madagascar	149	98	31	29
Malawi	119	122	32	27
Mali	103	86	46	30
Mauritania	101	108	26	23
Mozambique	121	107	24	18
Niger	69	55	14	9
Rwanda	150	152	23	21
Sao Tome and Principe	133	134	49	54
Senegal	83	84	34	27
Sierra Leone	168	148	42	28
Somalia	42	23	11	5
Sudan	78	70	40	36
Tanzania	111	109	7	5
Togo	119	111	54	28
Uganda	120	121	27	23
Zambia	120	118	50	41

Source: UNICEF statistics. Available at www.unicef.org

There are three criteria for the identification of the LDCs, all based on some form of vulnerability. Thus, besides the low-income criterion, there are the human resource vulnerability criterion and the economic vulnerability criterion. The human asset index, which is the indicator for the human resource vulnerability criterion includes the gross secondary enrolment rates. On the other hand, the economic vulnerability criterion includes the economic importance of non-traditional activities (share of manufacturing and modern services in GDP).

The lack of employment opportunities in African LDCs is substantially caused by the nature and pace of economic growth and insufficient attention and implementation of specific employment policies (AUC 2004, ECA 2005, ECA 2010). One of the key aspects of employment policies is the adequate supply of appropriate skills for labour market demand. In African LDCs, this linkage is weak due to capital intensive growth and the current skill profiles produced by the educational system. Indeed, the Mali national policy response to a drop in cotton related export revenues was severely hampered by the link that characterize LDC vulnerability- low level of human assets and high level of economic vulnerability. The diversification into other economic activity was constrained by a shortage of qualified labour for more skill-intensive sectors (Johnson 2006).

The recent Istanbul Programme of Action for LDCs recognizes that economic growth in LDCs is largely primary commodity dependent and that structural transformation is a necessary strategy to improve economic resilience to exogenous shocks (UN2011). This is predicated on adequate resilient human capital that underpins overall economic development and industrial production.

The production of education graduates currently in African LDCs is predominately primary school graduates. The content of primary school graduates' production is numeracy and literacy skills. This in turn provides inadequate content supply for a labour market that is increasingly knowledge-intensive. Indeed, among the most critical dimensions of change are the converging impact of globalization and the increasing vital role of knowledge as a driver of economic growth. Knowledge creation and accumulation have increasingly become major factors in economic development and becoming the core of a country's comparative advantage (World Bank 2005). Consequently "employability" becomes a key issue in African LDCs wherein the outcome of educational production does not result in adequate labour market absorption.

This state of affairs results in the proliferation of "vulnerable employment". This "vulnerable employment" is the sum of own-account workers and unpaid family

workers. It provides an insight into the widespread use of informal work arrangements, where workers lack adequate social protection and social dialogue mechanisms. Such arrangements are often associated with low pay and difficult working conditions (ILO, 2011). Work vulnerability is a reflection of the mismatch between the educational sector and labour market demand. In addition, it provides a human capital base that is not conducive for structural transformation, sustainable economic development and poverty reduction.

Although the Brussels Programme of Action adopted in 2001 refers to primary education (UN-OHRLLS, 2001, page 17), the Human Asset Index was modified in 2003 to include secondary education. This shift illustrates the growing concern that basic literacy and numeracy skills acquired from primary education are not sufficient to for solid human capital. However, the mere shift from primary to secondary education in the HAI is not enough. Although there have been tremendous efforts by developing countries toward achievement of universal primary education, this progress is yet to be extended to secondary education (access). Indeed, whilst African LDCs have made significant progress towards achieving universal primary education, serious concerns about content and quality remain. To keep pace with competitive and globalized markets and fast-changing technologies, educational systems must focus on the improvement of cognitive skills and hence productivity levels. To the extent that the quality of education is not adapted to the needs of the economy, educational qualifications may not serve as a screening mechanism for employment purposes. Furthermore, secondary and even higher education graduates in LDCs, especially in Africa LDCs are not spared by unemployment while at the same time specific skills are missing in the labour market, thus illustrating a skills mismatch. Improvement of secondary education in this regard should also address curriculum in order to equip graduates with the skills that are required by the labour market (quality). Indeed, the imperative of improving both access to and quality of secondary education graduates is driven by two statements of fact. First, achievement of universal primary education is for the foreseeable future, so there is a need to start thinking above this level[2]. Second, secondary education in African LDCs mainly produces graduates with too general knowledge and who are not readily competent for any trade. Thus the content of secondary education itself has to be modified so as to include a set of skills that prepares graduates for the world of work.

According to UNESCO data, the gross secondary enrolment ratio in African LDCs was only 33 percent for 2005-2009 for male, and 25 percent for female,

[2] Also, since primary education is expected to be universal soon, competitiveness on the labour market based on educational achievement will start with achievement of secondary education.

meaning that more than two thirds of boys and three quarters of girls in age to attend secondary school are excluded from such education. These aggregate figures mask disparities and conceal the dire situation of most African LDCs, with ratios as low as 19 percent for male and 16 percent for female in Angola, 18 percent for male and 10 percent for female in Central African Republic, 14 percent for male and 9 percent for female in and Niger and a mere 7 percent for male and 5 percent for female for Tanzania. Except for Lesotho and Sao Tome and Principe, the ratio is lower for girls than for boys in all African LDCs, further addressing the issue of increasing gender disparity with the level of education.

The human capital theory (Mincer 1958, Schultz 1961, Becker 1964) followed by empirical works on the rate of return of education (RORE) showed that the return of education at both individual and social level is higher for primary education, then for secondary and tertiary education (Mincer 1974, Psachadopoulos, 1994). These findings, along with the financial constraints for developing countries' budgets have underpinned the focus on primary education in the international development agenda, epitomized in Goal 2 of the MDGs: Achieve Universal Primary Education.

In their efforts to achieve MDG 2, developing countries, and more so LDCs implemented policies and programmes that ignored secondary education. However, recent research and empirical work (Weiss 1995, Bennell 1996) points out the limits of the focus on solely primary education, both in term of rationale (underlying assumptions) and in terms of the implications for the development agenda. For example, using estimates for sub-Saharan Africa Bennell (1996) showed that there are considerable problems in the estimation of ROREs in terms of sample selection bias on the demand side (individuals with a higher innate ability are more likely stay on longer in formal education) and lack of comparability of data, which all put some doubt on the accuracy of these estimates, and hence, the validity of the resulting policy recommendations. Also, Krueger and Lindahl (2001) found that as countries develop, secondary and post-secondary education matter more for growth than primary schooling. In a study of rates of return in education in urban areas of Zambia primary school rates of return were nil but positive beyond primary school (Nielsen 2001) In light of these new developments, the focus has to shift from solely primary to include higher levels of education, starting with secondary education. This has been confirmed in a study of South African educational systems that noted in order for the social rate of return to increase a raise in quality would lead to an increase in earnings that was large enough to offset the increased public costs (Hertz 2001).

However, improving access to secondary education is not sufficient. Because of the skills mismatch on the labour market, curricula in secondary education need to be modified so that graduates leave secondary schools equipped with specific skills demanded by the labour market in LDCs.

As noted earlier, the private sector is still weak to create enough jobs in LDcs. On the other hands, governments face budget constraints that limit their ability to recruit new staff. In this regard, self-employment becomes an alternative for young people entering the job market. However, because secondary education graduates have not receive any formal training for self-employment, those (actually the majority) that are not recruited either by the public sector or by the structured private sector end up in the informal sector. Entrepreneurship education (henceforth EPE) appears as an option to improve the output of secondary education in African LDCs.

While there are many definitions of EPE, one of the most used has been given by UNESCO and ILO. In a joint publication by the two institutions, EPE is defined as follows: “Entrepreneurship education is conceived in a broad sense as a pedagogic approach to fostering self-esteem and self-confidence by stimulating and nurturing the talents and creativity of the individual, while building the relevant skills and values that will assist learners in expanding their perspectives on schooling and opportunities beyond. Methodologies are based on the use of personal, behavioural, motivational, attitudinal and career planning activities” (UNESCO/ILO, 2006).

It is also acknowledged that the scope of EPE in broad, and that the areas covered by EPE, are varied and can comprise all aspects and dimensions of the education system. At the central and regional levels, it encompasses inputs such as legislation, financing, governance, curricula, teacher education and the roles of the different stakeholders in the public and private sectors. At the school level, it includes inputs such as teaching and learning methodologies, testing and certification, out-of-class and out-of-school activities, school administration, staff development and local community involvement (UNESCO, 2010).

UNESCO and the StratREAL Foundation have co-operated a project in four Arab states (Egypt, Jordan, Oman and Tunisia) in the field of “entrepreneurship education” (EPE). The overall objective of the project was to support the integration of EPE in educational policies, systems, programmes and practices in the Arab States. Indeed, it is expected that such integration will have an impact at the individual, enterprise and national levels (UNESCO, *ibid*). First, at the individual level, EPE has the potential to enhance life-skills, widens experiences

and prepares for the world of work. Consequently, EPE would help to promote higher income through income-generating activities, higher standards of living and satisfaction, and a sense of achievement. Second, at the enterprise level, EPE is expected to support innovation, higher productivity, an enhanced level of competitiveness and a better work environment. Third, at the national level, EPE can assist in obtaining higher economic growth and enhance the trend towards self-employment, leading to a reduction in unemployment, especially among young people (UNESCO, *ibid*).

In addition to the above project, there are many other on-going regional and international programmes and initiatives on EPE in the Arab region including among others: (i) the active learning CD-ROM on "Small and Medium Enterprises" (2005), developed by the Arab Labour Organization (ALO) and the Arab Centre for Human Resources Development (ACHRD); (ii) the Know About Business Programme implemented by ILO and targeted at targets teachers and instructors of TVET programmes; (iii) the Starting My Own Small Business Programme, developed by UNESCO and targeted at teachers and students of secondary level; (iv) the global project "Skills for Employability" implemented by addresses the challenges of the British Councils in several Arab countries and focusing on three areas: policy dialogue; institutional partnership; and enterprise and technology challenges.

The decomposition of growth in LDCs above shows that the main driver in most countries has been the primary sector (agriculture, exports of primary commodities, etc). While agriculture employs a large proportion of labour force in many LDCs, these people are generally not in decent employment. On the other hand, primary sectors like oil, mining and timber are more intensive in capital than in labour and/or require a highly skilled labour force that is most of the times imported by the companies in business.

In order to generate decent employment and to increase their resilience to external shocks, African LDCs need to implement relevant strategies leading to a structural mutation of production and export bases. This economic diversification could be horizontal (i.e. emergence of new sectors) or vertical (i.e broader range of products in the same sector). In any case, it would constitute a powerful tool of transformation of their economies. Indeed, diversification carries two main advantages. First, the current production and export structure of LDCs is overly reliant on only a few primary commodities (oil in Angola and Chad, timber and diamonds in CAR and DRC, cashew nuts in Guinea-Bissau). Within this context, a proper process of diversification in these countries would explore other sectors that have a high potential for job creation (manufacturing and industrial

agriculture,), and would eventually lead to reduction in unemployment and poverty.
Second, expanding the range of economic activities has a direct implication on tax revenues (which will increase as a result of the widening of the tax base), and hence on the gross domestic savings rate that is necessary for future investment.

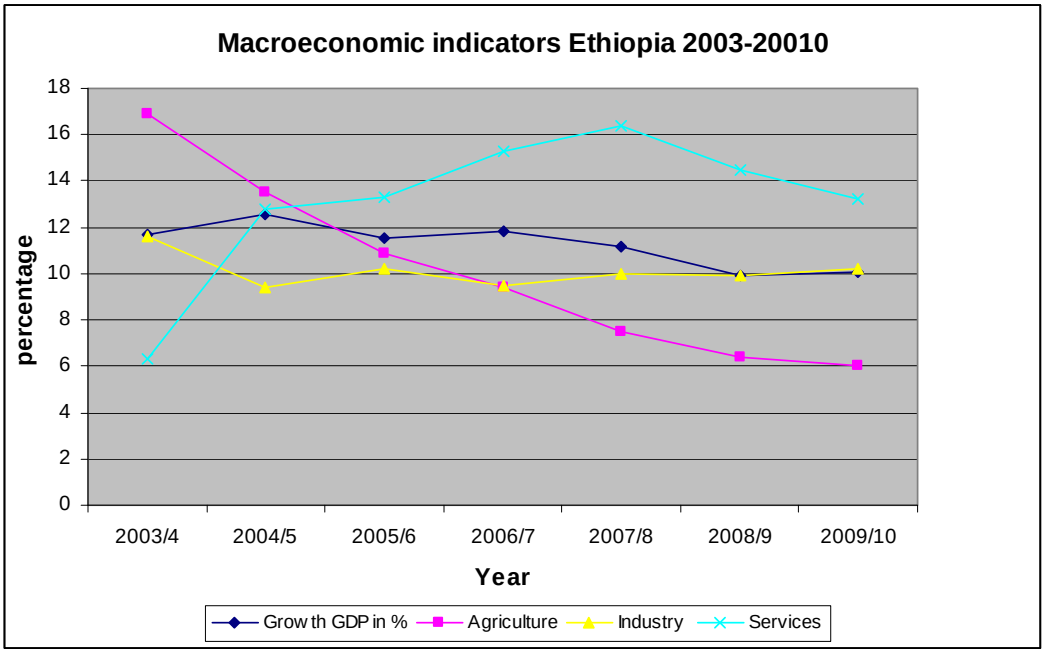
As can been seen from Table 2 (see section 1), the share of manufacturing in the GDP remains very low. African LDCs could and should clearly increase this share as a strategy to improve their resilience to exogenous shocks (in the short run), but also to undertake the structural transformation of their economies (in the long run).

Educated people often have a wider range of options to address challenges and adversity. The new challenges of structural transformation for African LDCs go beyond achieving quantitative targets and embedding education as the critical factor of development. The limits in terms of employment creation and poverty reduction through an inadequate attention to level and quality of educational policies is depicted in the Ethiopia case study that follows.

Ethiopia: A case in point; Educational achievement in Ethiopia has made tremendous progress (See Figure 3). During the Plan for Accelerated and Sustained Development to End Poverty (2005-2009) period the primary net enrolment rate increased from 68.5 per cent to 87.9 percent and the number of schools increased from 16,513 to 25,217. Secondary school enrolment increased only marginally from 11.8 to 12.6 percent during the same period. This took place in a context of a high growth trajectory of 11 percent since 2004 (MOFED 2010).

While undeniably impressive, certain structural constraints have emerged. The clearest distress signals are the deteriorating conditions in ‘classrooms throughout most o f the country. Since 1993-94, the pupil-teacher ratio, an accepted proxy for quality, has remained high. In 2001-02, Ethiopia’s pupil-teacher ratios were 65: l in government primary schools and it decreased slightly to 57:1 by 2009/2010. Indeed, whilst net enrolment was increasing completion rates have remained low at approximately 60 percent, again a reflection of low quality (World Bank 2005).

Figure 3: Macroeconomic indicators for Ethiopia, 2003-2010



Source: Ministry of Finance and Economic Development National Accounts

This has resulted in constrained transition towards post-primary education enrolment, a necessary condition for structural transformation (UNICEF 1990). In addition, the content of primary school outcomes-numeracy and literacy skills-did not match a small but dynamic industrialization process demand for a more skilled workforce. The lack of "employability" of a strong predominance and focus on primary school did not result in appreciable employment opportunities and poverty reduction.

Ethiopia growth has not resulted in employment opportunities and the "vulnerable employment" emerging out of necessity rather than profit[3]. The common perception fact that the extremely large informal sector is a reflection of a business drive has two main handicaps.

[3] The source of the data on Ethiopia is a survey questionnaire conducted in 2009 on women entrepreneurs in the informal sector (UNECA & ILO 2009). The response by 50 women entrepreneurs is not representative but is indicative of the role of educational vulnerability in this paper

Firstly, those employed within the informal sector lie outside legal protection and national working conditions standards. This has an effect on increasing vulnerability of the workforce and as has been amply demonstrated led to an increase in the working poor. This consequently increases demand for social protection and raises in budgetary allocations to tackle vulnerable groups.

Secondly, the ability to profit from opportunities is not the same as entrepreneurial skills needed to run modern industrial organizations, which require large economies of scale, longer lead times, technology choices and a more complex organization than informal sector activities (UNICEF 1990).

Ethiopia, like several African LDCs, has limited opportunities in the formal sector. The study showed that starting an informal business was the desire to be self-employed and/or independent. Many remained unlicensed because of the fear of higher taxes and increased general costs.

There were two specific questions on education-level of education attained by respondents and whether they were forced to drop out of school. The results show that 33 percent of respondents had primary education and 25 percent had no education. Furthermore, 63 percent of respondents dropped out of school primarily to look for a job and/or to support the family.

The survey goes on to conclude that the income generated through informal activity is not reliable and working conditions are poor, thus vulnerability remains entrenched in informal economic activity. The low level of skills achieved by the respondents has reinforced their rational response to survivalist employment opportunities. This creates a vicious circle of low educational attainment matching informal employment and the reinforcement and reproduction of vulnerability.

The Ethiopian case reiterates the case that building resilience through a process of structural transformation is dependent on adequate educational outcomes. The advantages of industrialization are not solely to build resilience in African LDCs to exogenous shocks or the physical expansion of manufacturing capacity. The rise of industrial capacity also drives a modernization process that creates a demand for new skills and technologies that compel societies to enlarge the scientific and educational base.

This has been recognized with the new Istanbul Programme of Action for LDCs that proposes a paradigm shift from the export oriented model of the expired Brussels Programme of Action (2001-2010) to one focusing on productive

capacities (UN). The educational aspect of productive capacity has been rightly placed on secondary education gross enrolment to provide an adequate skill mix for the transformation of LDCs and their graduation from this category.

The above cannot be reduced to a reductionist perspective of post primary education seen as a necessary and sufficient condition for higher growth and structural transformation of African LDCs. Indeed human capital is a factor of production and should be considered not only as a stock but also in as much as it contributes to growth indirectly as a determinant of the capacity to produce and absorb new knowledge (Guillaumont 2009).

The East Asian human Resource led Development: The success stories of the critical role played by educational outcomes in economic growth and structural transformation demonstrates that the complex interplay of three sets of factors- policy incentives; capabilities and institutions- were critical. The next section highlights the role of educational outcomes in driving not only economic growth, but also the transformation of poor Asian countries in what is commonly known as East Asia Newly Industrialized Countries (NICs).

The NICs have had spectacular annual growth rate of outputs well in excess of 6 percent. This has been sustained over a 30 year period and has been crucial for the structural transformation of these economies since 1960 from agriculturally based to industrial and post-industrial economies, thus increasing their resilience to exogenous shocks.

A combination of factors accounts for this transformation. These include stable macroeconomic policies, openness to trade, high savings rate, sound institutional frameworks and priority investments into human resource development related to skills and knowledge (World Bank 1993). The axiom underpinning growth and transformation was that ultimately it is the quality of human resources in terms of knowledge and skills that constitute the basic foundation of economic growth. It is the critical determinant of the structure of production, competitiveness and technological innovations. Equally importantly the quality of human resources is also a cause whether a country moves up the economic ladder from one stage of economic development to another (Deolalikar et al 1997). In fact, the value of education in dealing with disequilibria or changes in economic conditions is clear in agricultural contexts. In an environment where agricultural practices are stagnant, farmers' education has limited impact unless this is complimented by technology inputs that raise productivity (Schulz 1988).

In another World Bank study, the above conditions were identified as instrumental for specific deliberate educational development. The high rates of growth and the focus on shared growth complimented by a rapid demographic transition and strong public institutions were enabling conditions. In short, rapid growth generated domestic resources necessary to finance educational policies which in turn boosted economic growth through the provision of skilled manpower combined with technical innovation to sustain economic growth over a longer period.

The lessons inferred for African LDCs should be contextualized within the initial conditions of the NICs in the 60s. Average income growth per capita over the 1960-1985 demonstrates that a good primary school system plus strong evidence of equality of land ownership and more unbiased income distribution were better initial conditions than in other developing countries (Rodrik 1994). This did provide the NICs with a more adequate base for economic development and structural transformation.

The initial conditions in African LDCs is by and large not similar to the NICs in the 60s but certain aspects, for example primary school enrolments, are now more conducive towards a diversified growth path. However, initial conditions apart, the investments in education seem to be central to the economic success of the NICs (Haq 1990, Wood and Berg 1994). Again the primacy of education was contextualized within policy incentives and institutions. As the Asian Development Bank (ADB 1997a) concluded, East Asia benefited from rapid accumulation of physical capital, an increasingly sophisticated internal and international division of labor, rapid demographic transition, and endogenous growth factors, included institutions, values and human resource development (Romer 1986, 1990a, 1990b).

While recognizing that education contributes to economic growth, it is widely held simultaneously that the fast economic growth in these economies also enabled them to maintain a high level of investments in human capital. In other words, investments in human capital contributed to high economic growth and also to better income distribution in East Asia; and human capital, in turn, received dividends from these two gains on the economic front. So an analysis of the pattern of investments in human capital in the region will be of considerable policy use to African LDCs as they diversify their economy and increase resilience. The analysis of investment levels in education , level of education and its links to institutions and public policy in NICs can assist in eliciting lessons learnt.

Openness to trade has generally been considered one of the drivers of economic growth. Therefore an export-led trade regime is superior to import substitution not because the former permits specialization, importing technology and the growth of skills and capabilities. The "appropriate" policy incentives along the export-led direction did mean in the context of the NICs that selective and sustainable protection in strategic areas of public interest were administered. Quick gains in competitiveness, transfer of technology and manufacturing employment opportunities were the criteria for industrial selectivity by the State. For example, South Korea's selective protection, led by nationally owned enterprises, of industrial sectors considered strategic was one of the characteristics of moving up the development ladder (Pack and Westphal 1986).

African countries including African LDCs have intervened with import substitution in the 60s and 70s, but generally the type of protection did not place premiums on efficiency and other aspects of industrial capacity building. This in a context of small fragmented markets, less technical skills and technological growth did not result in a dynamic integrated industrial process. However, Mauritius and Kenya, both non LDCs, experienced a respectable level of technological proficiency with some degree of protection (Pack 1997). It is important to note that both these African countries have a relatively well developed education system.

Institutions in this context are entities which facilitate the functioning of markets. For example, one of the key institutions arrangements introduced in Singapore was to link the educational system to labour market through a multi-facted approach. The Manpower Research and Statistics division undertakes econometric forecasting for the skills requirement over the short, medium and long term in addition to a cross-Ministerial meeting to identify the skills needs. Skill demand in turn is converted into supply through an expansion of pre-employment training, upgrading the skills of existing workforce by the Economic Development Board and the Workforce Development Agency. This educational and training strategy is complimented by the latter institution of skill conversion, skill upgrading and enhanced employability of lower skilled workers (CEI 2010).

The intensive intervention by this East Asian economy to address skill mismatch has similar public involvement in other NICs. For example, the productivity councils in Taiwan and South Korea of the role of productivity councils whose institutional mandates were to provide feedback from the industrial sector to the educational field in particular to curriculum development, science and technology policies and training in general (Paddison and Gauci 2001).

The overall focus on education in NICs was based on the concept that education and development are inextricably linked. Furthermore, institutions that facilitated links between labour markets and educational outcomes were established. This provided a paradigm shift of technology catch-up and moving up the value chain and hence transforming the economy. In other words, skill and human resource development were prioritized not to be trapped in a low skill trap with an advantage of low-wage workforce but on raising skill levels and building on a highly skilled labour force in the future that will sustain economic growth.

The skill levels and capabilities in providing educational resilience is the third aspect in NICs of interest to African LDCs. Firstly, a significant growth in educational growth preceded economic growth. The quantitative expansion in the post-war period took place in secondary and tertiary education, as the NICs in general had already instituted compulsory education. Indeed, by 1960 primary education was universal in all East Asian countries. The expansion of education enrolment contributed to the build up of human capital.

Secondly, all the NICs had invested in education which had resulted in increased enrolment. However, given the drop in fertility rates and a resultant smaller school age group in effect the expenditure per student increased significantly as allocation of resources to education remained unchanged. Furthermore, intrasectoral allocation of resources was extremely balanced across levels of education. This also reflects recognition by the State of the interdependence of all levels of education. Indeed whilst expenditure per student at the three levels tend to converge in NICs and the degree of unevenness[4] is low. For example Korea higher to primary expenditure per student ratio was 0.5 whilst it was 25.5 in the African LDCs in the mid nineties (World Bank).

Thirdly, with the reasonable level of investment and a declining growth in population the NICs allocated the higher expenditure per student to quality improvements. This can be gauged by the teacher-student ratios of approximately 20 whilst in African LDCs it is forty (UNESCO 2011). In addition, teaching materials, technical equipment and information technology were introduced to further upgrade quality outcomes.

Fourthly, vocational and technical education whilst crucial in further aligning skills to demand was not through public expenditure. There was a strategy by the NICS to place vocational and technical training outside the formal educational system. For example in Singapore a Skill Development Fund was established ands

[4] The degree of unevenness is measured as a simple ratio of expenditure per student (World Bank)

financed through a levy on private employers. On-the-job training was an important aspect of participation by the private sector on education for development.

Lastly, linked to this was an investment in Research & Development activities introduced by the NICs. An interesting aspect of Research and Development was their institutional setting was outside Universities and based on specialized institutions –public and private. There was an emphasis on product and technology development reasserting coordination between education and research and ensuring mastery of foreign technology.

5. African LDCs: What we can and what we cannot infer

The East Asian countries high economic growth based on an integrated approach to education and knowledge provides African LDCs with interesting policy and institutional parallels for structural transformation.

The initial status of NICs with high primary schooling enrolment rates as an explanatory variable in high growth performance is vital. African LDCs in the 1999[5] had a much lower primary school enrolment at approximately 58 percent. The progress achieved by African LDCs in primary school enrolment since the 90s has been significant and have surpassed developed countries rate progress towards universal primary education (Clements 2004). The trends whilst positive in African LDCs required considerable financial and policy efforts to catch-up with universal primary education. The focus on catching up with numeracy and literacy skills was further encapsulated in the internationally agreed to goals including the MDGs.

An important corollary to the initial status was the demographic dividend. In the 60s in the NICs population growth was relatively low. This with no significant changes in educational investment and a slower growth in student population made budgetary allocations per student higher. This in turn resulted in higher quality of educational outcomes. On the other hand, African LDCs high population growth has had an effect on increasing student populations in primary school. The progress achieved so far in African LDCs is ever the more significant given the population growth, but has had decreasing allocation of resources per unit and teacher supply among its major constraints resulting in drops in quality.

An important aspect of the NICs educational investment patterns was functional to the perspective of education as the kernel of sustained growth and structural

[5] The base year for measuring progress towards the MDGs was taken not as an arbitrary choice but as a initial condition that recognized education as vital.

transformation. The balance between primary, secondary and tertiary investments was vital in tackling supply constraints such as teacher training and in more general terms ensured knowledge inputs to match the dynamism of the economy and also its industrialization. The African LDCs on the other hand have very low secondary and tertiary education cycle enrolments. This further constrained an industrialization processes and possible structural transformation. In addition, the political consensus garnered around the MDGs made the imperative of primary school enrolment and completion even the more compelling.

There is an acknowledgment of at least secondary education as crucial input into industrial development (UNICEF 1997, Guillaumont 2009). There is interestingly enough recognition by the LDCs in general and African LDCS in particular that secondary education better captures the educational resilience needed to industrialize and transform their economies. This has been confirmed in an ECA study on encouraging innovation for productivity growth in Africa[6]. The main results show that secondary education school enrolment seems to be particularly important for labour productivity growth in non-agricultural sectors. The important role of secondary education has been recognized in the Human Asset Index has since 2003 established secondary education as an indicator for eligibility and graduation from LDC characterization (CDP, 2003). There seems to be a misalignment between the MDGs and the Human Asset Index on education with the former emphasizing primary education whilst the latter focus on secondary education. This has been rectified to some extent by the Istanbul Programme of Action that urges African LDCs to ensure universal access to free primary education in least developed countries by increasing the enrolment and retention rates, and also increase access to secondary, tertiary and vocational education and skill development training. However in LDCs there seems to be an incremental approach to education and economic growth that unless universal primary education is achieved, post-primary is less effective. This is in sharp contrast to the balanced approach by the NICs.

As has been observed in the NICs, the key element was the mainstreaming of education into overall development strategies and anchoring educational outcomes to policy incentives and institutions. The generally State led institutions on feedback from employers to skill supplied from the educational system was fundamental. The focus on technology in curricula development across all educational levels complimented by State led research and development institutions reflected a number of important aspects. The first is that there is a strategic role of education and knowledge in structurally transforming the

6

economy and sustaining long-term growth. The symbiotic link between education, technological development and economic growth was decisive in the East Asian success story.

The African Union Commission, the principal pan-African institution, has proposed a more holistic approach to education through The Second Decade of Education for Africa (2006-2015) built on the gaps identified in the first education plan with a more integrated approach to education. The role of science and technology in this resolution is still not clearly set out. The complimentary functions of institutions and policy initiatives have been left to national level. In this manner, whilst education has taken a more central role in development lack of direction, coordination and coherence are apparent in African LDCs.

Another important aspect in the sustained growth in NICs and the role of education is vocational and technical education. It was not through high public expenditures that vocational training including on-the-job training was a major input into sustained development. The role of the private sector in subsidizing training through specific taxes was a common aspect in the NICs. In addition, the training institutions were generally outside the formal educational system-a strategic division between education and training. This was done in order to ensure attractive returns to general secondary education and provide technical training sequentially to and in addition to a formal education (Bennell 1995).

The African LDCs in this regard have made some leeway in introducing vocational and technical training, but the strategic role of the State in placing this outside formal education and mobilizing private sector resources to training is generally absent. This has made vocational and technical training a general educational policy, public financed and not linked to labour demand.

References

Afeti G. 2009. Technical and Vocational Education and Training for Industrialization. African Research and Resource Forum.

African Union Commission (AUC) (2004). Harmonization and Coordination Framework for the Labour Market Information System in Africa 8th ORDINARY SESSION on "Promoting Employment for Social Cohesion and Inclusive Growth", Oudadougou, Burkina Faso

Asian development Bank (1997a) *Emerging Asia: Changes and Challenges*.

Barro, J. (1998), Human Capital and Growth in Cross-Country Regressions, *Manuscript*, Harvard University

Barro, R. & Lee, J.-W. (1993), Data Set for a Penal of 138 Countries, *Incomplete Draft, Cambridge, MA.*

Barro, R. & Sala-i-Martin, X. (1995), Economic Growth, *McGraw-Hill*, New York

Becker, G. (1964) *Human Capital*, National Bureau of Economic Research, New York.

Benhabib, J. & Spiegel, M. (1994), The Role of Human Capital in Economic Development – Evidence from aggregate cross-country data, *Journal of Monetary Economics 34*, page 143-173.

Bennell, P. (1996) "rates of return to education: does the conventional pattern prevail in sub-Saharan Africa?" *World Development*, Vol.24, No.1, pp.183-199.

Boateng, K. 2002. Higher Education and the Labour Market: A Logical Framework for Policy Makers in Africa's Education Sector. UNECA Working Papers Series.

CDP (2006) CEI Youth Forum: ``Education and Employment of Young People – Challenges and Prospectives``, Brussels

Clements M (2004) "The Long Walk to School: International Education Goals in Historical Perspective," Working Papers No. 37. Washington, DC: Center for Global Development.

Deolalikar A, Hasan R, Khan H, Quibria M (1997) Competitiveness and human Resource development in Asia, Asian development Review, Vol 15 No 2.

Freeman, R.B, Lindauer D (1999) Why Not Africa?, *NBER Working Paper No. w6942*

ECA, AUC, AfDB and UNDP, 2011. Assessing Progress in Africa toward the Millennium Development Goals.

ECA, 2005. Youth, Education, Skills and Employment. Poverty and Social Policy Team, ESPD. December 2005.

ECA (2005) Economic Report on Africa: Meeting the Challenges of unemployment and poverty in Africa, Addis Ababa

ECA (2010) Economic Report on Africa: Promoting high-level sustainable growth to reduce unemployment in Africa, Addis Ababa

ECA & ILO (2009) *The impact of young women's vulnerabilities on opportunities to become an entrepreneur: a case study of Ethiopia*, Report on Youth Employment opportunities in Africa

Gauci, Adrian, and Oliver Paddison (2001). Towards a Knowledge-based Economy: The Relevance of Curricula in Africa. Economic Commission for Africa Discussion Paper Series ECA/ESPD/DPS/1/2001. Addis Ababa. October.

Glewwe, P. (1991), Schooling, Skills and the Returns to Government Investment in Education, *Living Standards Measurement Study Working Paper 76, World Bank.*

Guillaumont P (2009) *Caught in a trap Identifying the least developed countries*, Paris

Hertz G (2001) Education Inequality and economic mobility in South Africa, Ph.D Thesis, Amherst College, USA

ILO, 2011. Enhancing Productive Capacities and the Role of the Private Sector in the LDCs, ILO, 11 May 2011.

Johnson, W (2006) Policy responses to economic vulnerability, CDP background paer no 9, United Nations

Krueger, A.B. and M. Lindahl (2001) “Education for growth: why and for whom?” *Journal of Economic Literature*, Vol.39, No.4, pp.1101-1136.

Lall, S Education, skills and industrial development in the structural transformation of Africa, Innocenti Occasional Papers, UNICEF

Mincer, J. (1958) “Investment in human capital and personal income distribution,” *Journal of Political Economy*, Vol.66, pp.281-302.

Mincer, J. (1974) *Schooling, Earnings, and Experience*, Columbia University Press, New York.

Nelson, R & Phelps, E. (1966), Investment in Humans, Technological Diffusion and Economic Growth, *American Economic Review*, 61, pages 69-75

Nielsen T (2001) returns to schooling in LDCS; New Evidence in Zambia, Working paper

Pack.H, Nelson R (1997) The Asian Miracle and Modern Growth Theory, Columbia University

Psacharopoulos, G. (Ed.) (1987), Economics and Education: Research and Studies, *Pergamon Press*, Oxford

Psacharopoulos, G. (1994) “Returns to investment in education: a global update,” *World Development*, Vol.22, No.9, pp.1325-1343.

Radelet, S. (2010) Emerging Africa: How 17 countries are leading the way,

Rodrik D (1994) “King Kong meets Godzilla: The World Bank and the East Asian Miracle” *Miracle or Design? Lessons from the East Asian Experience*

Romer, Paul M (1986) "Increasing Returns and Long-Run Growth." *Journal of Political Economy 94(5):*
1002-36.

Romer, P. (1990), Human Capital and Growth: Theory and Evidence, *Carnegie-Rochester Conference Series on Public Policy 32*, pages 251-286.

Schultz, T.W. (1961) “Investment in human capital,” *American Economic Review*, Vol.51, pp.1-17.

Schultz, T.W. (1988) "Education Investments and Returns." In H. Chenery and T. N. Srinivasan, eds., *Handbook of DevelopmentE conomics*V ol I, pp. 543-630. Amsterdam:N orth Holland.

Solow, R. M. (1956), A Contribution to the Theory of Economic Growth, *Quarterly Journal of Economics*, 70, 1, p. 65-94

Stokey, N. (1994), Comments on Barro and Lee, *Carnegie-Rochester Conference Series on Public Policy* 40, pages 47-57.

Tilak, J. G .2001. Building Human Capital What Others Can Learn. World Bank Institute Working Papers Series.

UNESCO, 2010. Entrepreneurship Education in the Arab States, A joint Project of UNESCO and the StratREAL Foundation United Kingdom: Case Studies on the Arab States: Jordan, Tunisia, Oman, Egypt and the Synthesis Report. April 2010.

UN-OHRLLS, 2001. Brussels Programme of Action: Addressing the Special Needs of the Least Developed Countries.

UNESCO (2011) Education for All monitoring Report: The hidden crisis Armed conflict and education, Paris

Weiss, A. (1995) “Human capital vs. signalling explanations of wages,” *Journal of Economic Perspectives,* Vol.9, No.4, pp.133-154.

World Bank (2005) The construction of a knowledge based society, Washington

Wood, A., and K. Berg. 1994. "Exporting Manufacturers: Trade Policy or Human Resources?" IDS Discussion Paper. Sussex: Institute of Development Studies.