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**Promoting critical knowledge, skills and
qualifications for sustainable development in
Africa: How to design and implement an effective
response by education and training systems**

**INTRODUCTION TO KEY ISSUES AND FINDINGS
OF THE ADEA 2012 TRIENNIAL: A READER'S DIGEST**

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Working Document

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1. MAIN THRUST OF THE TRIENNIAL

1. The theme of the ADEA 2012 Triennial, Promoting critical knowledge, skills and qualifications for sustainable development in Africa: how to design and implement an effective response by education and training systems, poses one of the most fundamental questions regarding the relationship between education and training and sustainable social and economic development. Indeed, while there is strong evidence of the correlation between educational development and socioeconomic development in other parts of the world, in Africa, despite notable progress made over the last five decades in terms of basic education coverage and literacy rates, socioeconomic development that has the potential for lifting sizeable segments of African populations out of poverty has not been achieved. This state of affairs leaves African countries at the margin and mercy of a globalized world economy where only highly educated and skilled nations compete and reap the benefits of social progress, rational production, and trade of goods and services which are at the core of sustainable socioeconomic development.

2. The Triennial also takes into account the current climate of “Afro-optimism”. For the last 10 years or so African economies have been growing at very appreciable rates, so much so that this growth has attracted renewed attention from the very corners that saw Africa as a continent of “darkness” and “hopelessness” unworthy of investment. With its many conflicts and natural and man-made disasters, Africa was indeed unattractive. The rediscovered interest has a lot to do with the current world financial crisis and the emergence of BRICS (Brazil, the Russian Federation, India, China and South Africa) and their interest in the African potential. The continent is now seen as one of the most important sources for jump-starting the stalled world economy. As the African Development Bank pointed out in its recent vision document, *Africa in 50 years’ time*, “Africa has some of the most abundant natural resources in the world, many of which are yet to be tapped. These include not just minerals and oil, but also bountiful possibilities for clean energy. But natural resources are not Africa’s only advantage. While Western countries are shouldering the burden of aging populations, Africa is the world’s youngest continent. If it invests in education and training to develop the potential of its youth, Africa could become one of the most dynamic and productive of economies.”(p.5)¹

3. This introduction presents the key findings, issues, concepts and messages emerging from analytical and consultative work carried out by ADEA for the 2012 Triennial Meeting. The document focuses on three concerns: (i) an abridged discussion of key issues, concepts and outcomes of the analytical work and consultative process put in motion by ADEA to understand the intimate relationships between education and training and sustainable development; (ii) a framework for critical reflection on the policies and strategies capable of transforming education and training systems into engines for socioeconomic development; and (iii) a partnership framework for collective action in the aftermath of the Triennial. The key issues and findings mentioned here are only the most salient ones. Further reading of the general synthesis and the three sub-thematic syntheses is necessary to better grasp the breadth and depth of the policy implications of the work results.

1.1. Education and training for sustainable development in Africa: what is the link?

4. Sustainable development entails systemic changes at four dimensional levels: economic, environmental, societal and cultural-political. At the economic level, it requires a major shift from the current model of economic growth that overuses natural resources in the production of goods towards a model that makes use of the same resources but in a more rational and sustainable manner while at the same time generating growth. At the environmental level, it requires that serious attention be paid to the protection and preservation of the earth’s ecosystems that make human life possible. The current climate change and its devastating aftermaths are the direct result of man’s relentless attack on the

¹ *Africa in 50 Years’ Time: The Road towards Inclusive Growth*, September 2011.

ecosystems. At the societal level, it requires movement away from conflict-prone situations characterized by inequalities and inequities in the control and access of resources towards inclusive societies in which sources of social strife such as abject poverty, marginalization and discrimination are stemmed. At the cultural- political level, it requires that more consensual and democratic governance systems be put in place. However, these systems can only be sustained if societies cultivate cultural and spiritual understanding which will breed tolerance and solidarity.

5. These four dimensions are interrelated and complementary and demand a major shift in mindset, values, knowledge and skills. They present learning activities that require undoing or unlearning old paradigms of understanding the world and learning new ways that are sustainable for attaining development goals. For example, engineering students will learn new skills that will enable them to move from fossil energy-intensive systems of production to renewable energy systems that imitate ecosystems; environmental education will become compulsory, ensuring that future generations benefit from the same natural resources as past generations; peace education will permeate education and training systems in order to achieve the goal of inclusive societies. Democratization is also a learning activity which teaches good governance and makes accountability a key principle of functioning institutions. Education and training systems are therefore at the core of sustainable development.

1.2. Skills and lifelong learning

6. It is necessary to constantly adapt to a complex and rapidly-changing world, and the provision of continuous education is not enough. It needs to be underpinned by a diverse and integrated network of efficient schools, efficient and flexible vocational training courses, universities, higher education and research institutes focused on sustainable development, appropriate modes of training for adults and new models for sharing and collectively building knowledge and skills. According to the systemic paradigm, it will be necessary to have learning systems that are more complex and diversified in order to comprehend the world. However, the organization and management of diversified and integrated learning approaches and environments must be designed and developed in such a way as to enable everyone to learn about the world as it is now and how it will change. It is also necessary to promote a holistic and open learning culture and environment, for everyone, in all places, and in all fields of knowledge: an environment in which the challenge is not just to access knowledge but to share and develop it.

7. The main theme of the Triennial was formulated into three sub-themes: (i) Common Core Skills for lifelong learning and sustainable development; (ii) Lifelong technical and vocational skills development for sustainable socioeconomic growth in Africa; and (iii) Lifelong acquisition of scientific and technological knowledge and skills for the sustainable development of Africa in the context of globalization.

8. In addition to the analytical work, five consultative meetings were held to gather inputs and guidance from the main stakeholders: (i) private sector and civil society organizations; (ii) technical and vocational education and training (TVET), youth and employment ministers; (iii) African youth; (iv) book sector actors; and (v) South African public and private sectors.

2. BEYOND CONVENTIONAL KNOWLEDGE

2.1. Sub-theme 1: Common Core Skills for Lifelong Learning and Sustainable Development

9. The key issues addressed by sub-theme 1 are the conditions, developments and challenges in promoting common core skills (CCS) through basic education within a frame of lifelong learning and sustainable development. The sub-theme explores the extent to which basic education systems in Africa provide core skills that are essential for preparing persons for a more fulfilled life in terms of both cognitive and behavioral/social development. It is premised on the observation that acquisition of critical skills for the world of work starts at a very early age. Beginning in childhood, persons develop awareness about themselves and the world around them. In the process they develop elementary cognitive and social skills. They learn how to interact and communicate with their environment, give meaning to what they experience and secure benefits for their own growth. They also develop a sense of interest, curiosity, initiative, responsibility, all of which are of tremendous importance in their later development.

What are “common core skills”?

10. “Common core skills” can be defined as those basic learning outcomes – in the form of knowledge, skills, competencies, values and attitudes – that all people, young and old, should be able to acquire in the beginning or at some point in their lives in order to grow as human beings and to effectively participate in the socio-cultural, economic and political development of their society.

11. This definition assumes not only the acquisition of particular abilities but also the interest and commitment of acting upon this learning. In this context an extended definition of “skills” is proposed, as a “**combinational** form of knowledge that makes use of theoretical, procedural and environmental knowledge, or learning, know-how and life skills, to solve problems, make decisions, carry out plans, etc.” (ADEA, 2011).²

What have we learned from the analytical work carried out under sub-theme 1?

12. In Africa, across different countries and involving various categories of stakeholders, there has been a lot of reflection on the problems of poor quality learning, the limited value of what was learned and the low levels of achievement. This has produced a situation whereby broadly felt concerns and new insights have come to represent an array of what are considered to be valuable personal qualities and skills. The common categories that have been identified over time include the following: (i) communication, language and literacy skills; (ii) basic cognitive skills; (iii) personal development and life skills; (iv) social and citizenship skills; and (v) basic work-related skills. This categorization is not universal, and different countries or agencies use their own categorization.

13. The establishment of CCS packages by government is not new. Countries are used to listing the overall purposes of education in their curriculum documents for formal education. What is new is, firstly, the need to re-define desirable CCS far more precisely in light of Education for Sustainable Development (ESD) and to operationalize these as concretely as possible, and, secondly, to set CCS across all forms of learning for entire age-groups and within a frame of LLL. It may be helpful to explore the approach followed by the OECD.²

14. The experience has been that combinations of various categories of skills, values and attitudes have been examined and elaborated in relation to different age-groups. For example, in the context of early childhood education, the emphasis has tended to be on the significance of social and

² “Definition and Selection of Key Competencies: the DeSeCo Project” (2005).

cognitive skills. For a number of years, international technical agencies and NGOs focused on early childhood development (ECD) have argued for greater attention to early childhood care and development (ECCD) as a major focal point for improving the quality and effectiveness of learning in later school and adult years (ADEA, 2008).

15. It has been pointed out very convincingly that the first six years of life form the most critical period in the development of a child's brain. Positive stimulation of the brain during these years prepares the ground for building the child's capacity to learn, build language skills and interact with others in the future. The quality of pre-school learning tends to be crucial for a child's later academic success.

16. There is abundant international evidence that the essential "psychological capital" of children, in terms of their basic cognitive and non-cognitive dispositions, has already been formed in early socialization before they enter school (Nash and Harker, 2006; Esping-Andersen, 2006). The significance of structured basic education lies in its ability to build upon early acquired competences and to develop these further, with appropriate remedial work if necessary, to a desired level of learning outcomes at the end of the basic education level.

17. The present vision is that, apart from broad socio-medical support for the most disadvantaged and vulnerable families, comprehensive curricula and materials are required for early stimulation of children through play. Furthermore, there is much campaigning for at least two years of quality ECD programs to prepare children for school entry (ADEA, 2008).

18. For the school-going age-groups of children and adolescents, the emphasis has been on language and literacy skills, basic cognitive skills, life skills (including health education) and social/citizenship skills. Much work has been done by a wide variety of Africa-based and international organizations to develop, test and promote skills acquisition in these areas. Nevertheless, there are still major controversies regarding the language and literacy agendas.

19. In general, problems for skills development in these age-groups are not associated with recognition, guidelines or even funding; the main concern is how to effectively build these cross-cutting skills (along with appropriate values and attitudes) into subject-based school curricula, pedagogical strategies and assessment systems. Often, such skill development programs tend to be more successful when addressed in the extra-curricular sphere and as non-formal programs for young people out-of-school.

20. From the above, four key findings are noteworthy:

- a) In spite of increased coverage, there is much evidence that children are not learning essential skills and are thus handicapped in further education and training;
- b) It is possible for children to acquire an early interest in science education if teachers are properly trained;
- c) A major stumbling block in improving quality in education is ineffective pedagogical practices in the classroom (backed by inappropriate skill-oriented teaching-learning materials);
- d) Key areas of intervention must be the reform of teacher education and support, poor motivation of teachers and poor enabling environment for learning in schools.

21. In adult education, the emphasis continues to be on functional literacy in the broadest sense, usually including age-appropriate life skills, livelihood or vocational skills and social/citizenship skills. While most of these programs operate in the non-formal education sphere (without qualifications recognized in the formal system), increasingly countries are experimenting with equivalent programs for youth and adults which, though their format may be non-formal, are allowed to function as part of the formal system (UIL, 2011a). This implies that such programs may adopt a wider mix of skills in their curricula.

Consulting with the book sector actors

22. In October 2011 ADEA WG on Books and Learning Materials (WGBLM) brought together 60 participants representing a cross-section of key actors in the book industry (publishers, booksellers, printers, etc.) in order to discuss the challenges of creating a vibrant book sector and reading culture capable of sustaining quality education, acquisition of knowledge and skills and cultural development in Africa.

23. The Nairobi conference was premised on the following assumptions: the book and education sectors are strategic to the acquisition of critical knowledge, competences/skills and qualifications for the world of work. Of the three R's (reading, writing and arithmetic), the capacity to read is the most critical competency to acquire since it determines, to a large degree, success in the other two competencies. It also opens up a world of learning opportunities in schools and in other realms of life such as training in both non-formal and informal settings. It has now been established that one-third of what we learn is acquired informally, provided that we are able to read and access information. Books are also a significant instrument for preserving and imparting information and knowledge. Unfortunately, Africa's book and information output, when compared to those of other continents, is paltry and does not meet consumer needs. It is therefore not surprising that the world's lowest literacy rate among young people is in sub-Saharan Africa. Textbooks and reading materials are still rare in rural areas in most African countries. Even when they are available they are inaccessible to most people who need them because the books and materials are generally not in the local languages. Lifelong learning is therefore impeded. Without the opportunity to learn, people do not feel empowered to participate fully in economic and social activities that can transform their lives and pull them out of poverty. Indeed, the World Economic Forum Global Competitiveness Report notes that "workers who have received little formal education can carry out only simple manual work and find it much more difficult to adapt to more advanced production processes and techniques. Lack of basic education can therefore become a constraint on business development."

Outcomes and policy implications

24. After the three-day meeting and recognizing the significance of the education and book sectors in the acquisition of knowledge and skills, in the quest for lifelong learning, for personal and national development, and also appreciating the roles of the various stakeholders in a strategic industry, the participants made the following recommendations:

- a. Given the critical role books play in educational development and the subsequent benefits to national development through skills acquisition and knowledge, the governments must support, by setting up a special fund, indigenous publishers and give them incentives to produce relevant and affordable reading materials, especially in local languages.
- b. The long overdue and much talked about national book policies that are required to harmonize and regulate activities in the book industry MUST urgently be agreed upon through a consultative process and be accepted, enacted and implemented without further delay. To enforce the policies, individual governments must set up book development councils or regulatory bodies with financial support to make them fully operational.
- c. The Africa Union (AU) ought to take the book development agenda as a matter of priority and ensure that it is implemented. Recognition of publishing as a strategic industry is a MUST if Africans are to make sense of their development efforts.
- d. The AU should also influence governments to set up ministries of education and book development and employ technocrats in education and book matters to advise on all issues to do with challenges in education and book availability.
- e. The AU must revamp the Regional Centre for Book Development in Africa (CREPLA) and fully support its activities to encourage book development activities in Africa through policy formulation and regulation, research, data collection, bibliographic control and co-publishing networks.

2.2. Sub-theme 2: Lifelong technical and vocational skills development for sustainable socioeconomic growth in Africa

25. Africa's industrial output is one of the lowest in the world mainly due to little investment in creating a skilled workforce to pursue industrial development. Therefore, the main thrust of this sub-theme is the crucial role technical and vocational skills development (TVSD) could play in enabling young people and adults to participate actively in Africa's sustainable development. A skilled workforce is a factor for economic growth, wealth creation and poverty reduction. Many countries have formulated policies and strategies to develop TVSD to reach the greatest possible number of young people. However, there is still a long way to go between identification of skill and training requirements and the implementation of an effective, sustainable TVSD policy at country level and in the continent as a whole.

What is TVSD? Is it different from the traditional TVET concept?

26. The 2008 ADEA Biennial underscored the need for a paradigm shift in the delivery of TVET towards a more holistic and inclusive concept of technical and vocational skills development (TVSD) that is more flexible and responsive to labor market demands than the traditional supply-driven system. *Skills development* refers to "the acquisition of practical competencies, know-how and attitudes necessary to perform a trade or occupation in the labor market". Skills can be acquired either through formal public or private schools, institutions or centers, informal traditional apprenticeships, or non-formal semi-structured training. The terminology includes all forms of training and is not bound to just formal training in a formal classroom setting. Advocates for an all-encompassing view to training are urging for a change to a wider use of the terminology *skills development* in policy documents to cater for the need for a holistic and inclusive approach, including a stronger focus on issues related to both transition from school to work and human resource development in a lifelong learning context. TVSD is therefore non-discriminatory with regard to age, status or stage in life, type of learning or training environment, or level of training. TVSD acknowledges the diversity of provision and pathways and implies the recognition, validation and certification of skills acquired from different learning environments, including apprenticeships. It is these considerations that have influenced the formulation of the sub-theme as "Lifelong technical and vocational skills development for sustainable socio-economic growth in Africa".

What have we learned from the analytical work carried out under sub-theme 2?

27. The findings from the national case studies confirm that many countries have recently embarked on important legal and policy reforms geared towards a more holistic and flexible TVSD delivery system that is better coordinated and managed. Evidence from the case studies also shows that public-private multi-stakeholder partnerships involving key players such as government ministries responsible for education and training, enterprises, international donors and development partners, local communities, training providers, professional bodies, NGOs, CSOs, and the media are capable of generating synergies for the development of employable skills.

28. The participation of NGOs and faith-based organizations as well as professional bodies and trade associations in the delivery of TVSD has also been on the increase, particularly with regard to the skills needs of vulnerable groups such as women, poorly educated and uneducated youth, and urban slum dwellers. NGOs and churches are often present in areas where formal sector TVET providers are absent.

29. In recent years, the competency based training (CBT) approach has been acknowledged as a quality-improvement training methodology. Many countries have started piloting the CBT methodology in their training systems. However, the effectiveness of CBT also requires teachers who

are trained for CBT delivery and are regularly exposed to new technologies through periodic internships in industry.

30. In almost all sub-Saharan African countries, informal and private sector training providers account for the bulk of opportunities available to all categories of learners for the acquisition of employable skills. Traditional apprenticeships, NGOs, faith-based organizations (FBO) and on-the-job training provide the most opportunities for skills development for the vast majority of African youth. Informal sector employment and self-employment dominate in both rural and urban areas in Africa.

31. The integration of ICT and technology-mediated teaching and learning can also contribute to quality delivery. Unlike the situation in schools, colleges and universities, the use of ICT in TVSD delivery in Africa is still in its infancy.

32. Female participation in TVSD is generally low in the engineering and technology disciplines. In the West African sub-region, female participation in these traditionally male-dominated disciplines is less than 28%. However, this participation rate rises to more than 50% in the business and commercial disciplines.

33. Skills development in post conflict countries or contexts is particularly challenging. The TVSD environment in post-conflict zones is often characterized by damaged or destroyed academic infrastructure, poor learning facilities, low capacity and high demand for skills training, inadequate and poorly qualified teachers, and a dearth of data and statistics on the sector.

34. The acquisition of technical and vocational skills must lead to gainful employment. Hence, it is important that training be geared towards the needs of the labor market. One way of doing this is to create a mechanism for identifying and predicting the skills gaps and shortages at the workplace by following the dynamics of the labor market. One priority is to establish a labor market observatory or labor market information system to engineer a TVET delivery system that is flexible and responsive to the skills needs of the employment sector.

35. To ease the transition into the world of work, some countries have instituted a range of measures targeting new graduates, job-seekers and candidates willing to become self-employed. These measures range from providing access to information on jobs availability to business start-up credit facilities.

36. Holistic and inclusive TVSD requires an assessment and certification system that can validate and certify competencies and qualifications acquired from different learning environments, whether formal, non-formal or informal. A national qualifications framework (NQF) has been shown to be an effective tool for harmonizing learning achievements, validating experiential learning, and generally promoting lifelong learning. The development of a qualifications framework is high on the education and training reform agenda of many African countries. While some countries are already at an advanced stage of implementation, others are only just beginning the process. In this regard, Mauritius and South Africa are pacesetters, while The Gambia, Ghana, Mozambique, Nigeria, Senegal and Tanzania (to name only a few) are at various stages of implementation. Globally, more than 130 countries are currently exploring or developing NQFs.

37. Over the past five years or so, the revitalization of TVSD within the context of regional cooperation and dynamics has engaged the attention of the AU, the regional economic communities (RECs), and several UN agencies including UNESCO and UNDP. These regional initiatives are driven by a common understanding and acknowledgement of technical and vocational skills acquisition as a key requirement for tackling the problem of youth unemployment on the continent. The Economic Community of West African States (ECOWAS), the Francophone West African Monetary Union (UEMOA), the Southern Africa Development Community (SADC), and ADEA have been particularly active in driving the TVSD agenda on a regional basis.

38. An analytical review of the national case studies and background papers reveals a number of outstanding issues that need to be highlighted. These issues touch on the policy choices and

interventions that are more likely to promote a more robust and effective delivery of technical and vocational skills.

Outstanding issues and policy choices

Policy reforms must be rooted in national economic and human resource development strategies

39. Policy reforms must assign specific national development functions to TVSD. Is the policy focus on providing skills for supporting private sector growth or youth and women economic empowerment? Or is the thrust of the policy on diversifying the national stock of skills and the development of high level skills for participation in the global economy? Of course, a national TVSD policy can address all of these concerns and more. However, it is important to link TVSD policies to clear and realistic economic and national human resource development goals that also take into account national values and technological preferences.

There is need to revitalize the informal TVSD sector

40. The skills needs of out-of-school youth, early school leavers, and adults are best addressed by informal sector training providers. Formal sector training providers are often too rigid in their operations and training curricula, and are ill-equipped to respond to the peculiar training needs of these categories of learners in terms of flexibility in training delivery, teaching methodology, admission requirements, and language of instruction. Revitalizing the informal sector provision of skills will involve concrete efforts at the national level to regularly update the skills of master crafts persons and improve upon their pedagogical skills; introduce reforms into master-trainee performance contracts and agreements; and facilitate the injection of new technologies into the traditional apprenticeship system.

Provision of skills for the agricultural sector should be strengthened

41. With 60% of the world's uncultivated arable land, Africa has great potential for agricultural development and growth. TVSD policies and strategies should therefore include a strong component on the provision of skills required for areas such as irrigation, farm mechanization, land preparation, food processing, livestock production, marketing, and bio-fuels. In addition, there is need for review of land tenure systems that hamper access to land.

Policy reforms should target the development of higher level skills

42. The type of low-level skills often acquired through traditional apprenticeship (such as hairdressing, dressmaking, carpentry, etc.) are not capable of producing a globally competitive workforce imbued with the higher level skills necessary for technology adaptation and innovation, transformation of national production systems, and industrialization of the economy. TVSD policies and strategies should therefore address the development of both basic and higher level skills.

Mere acquisition of skills by youth does not lead to youth employment

43. Very often national TVSD policies and strategies fail to recognize that skills acquisition in itself does not create jobs or guarantee employment unless the training is matched to demand that is driven by the employment market and the national economy. National TVSD policies should therefore be based on a sound analysis of the employment market (the skilled labor employers want) and the education and training market (the type of training being delivered) while paying attention to the phenomenon of occupational elasticity or the rapidly changing typology of occupations.

Availability of skills is not a sufficient condition for economic growth

44. The availability of skills, even of the highest quality, does not constitute a sufficient condition for increased productivity and economic growth. New technologies and more efficient production systems and machinery are also important and may play more dominant roles in boosting productivity. However, the availability of a skilled and competent workforce is a necessary condition for driving the engine of growth for wealth creation. Investment in skills should therefore be accompanied by the modernization and improvement of production systems.

Economic, trade and industrialization policies impact on employment prospects

45. Government economic policies that support the manufacturing and productive sectors or stimulate the creation and growth of enterprises can raise the demand for employable skills. As the productive sectors of the economy grow, new or additional job and skills training opportunities emerge and more people get employed. The market effects of globalization on the supply, demand, and prices of imported goods also impact on employability. In effect, the influx of cheaper imported products on the domestic market can impact negatively on the employability and incomes of skilled workers engaged in the local production of similar goods which are priced out by cheaper imports.

46. Africa faces a huge deficit of infrastructure in terms of adequate roads, housing, power supply, water and sanitation systems, telecommunications, and transportation among others. A skilled workforce is required to build and maintain this infrastructure. The people exist but the skills are lacking. Africa's working age population (15–64 years) which currently stands at about 500 million people is projected to exceed 1.1 billion by 2040. The challenge is how to provide this large potential workforce with the education and skills necessary for sustainable socio-economic growth. Meeting this challenge will require the effective implementation of national policies and strategies that emphasize the development of lifelong technical and vocational skills and are firmly rooted in national knowledge and value systems.

Consulting with private sector and civil society actors

47. As preparation for the Triennial, consultations were held with private sector and civil society organizations. In addition to a forum held in Tunis in May 2011, ADEA also consulted in October 2011 with the South African private sector under the auspices of the Department of Basic Education. The objective of the Tunis forum was to provide an opportunity for organizations to define their roles in education and training and present their key messages for the Triennial. The South African consultation focused more on the establishment of a private-public partnership.

48. In Tunis, participants identified numerous challenges that plague the existing education and training systems. The education system functions in a way that does not focus on societal concerns and therefore does not produce what society or the labor market direly needs. The system is supply-driven and hence there is a mismatch between the skills produced and the skills actually required in industry. This disconnect between education and training on one hand and the labor market on the other results in the production of thousands of graduates annually while there is a dire shortage of the actual skills needed in the labor market.

49. Even when and where the educational systems produce the skills and competencies required, they do not meet the standards required by the labor market.

50. Although the labor market and the managers of education and training systems value each other and know that collaboration will enhance the attainment of their mutual goals, they tend to operate in isolation, hardly talking to each other. The challenge is that there is no mechanism for bridging the chasm between them. Vocational and technical training institutions are not adequate in number to train the new entrants for the labor market. The available few are not well equipped in terms of teaching personnel, infrastructure, updated training curricula and equipment.

51. Many governments do not pay enough attention to the training of artisans. The challenge is how to modernize training and make it attractive for artisans and farmers. There is a dire need to build the capacity of organizations that provide training in the informal sector.

52. Partnership with the private sector and other actors is lacking and hence training institutions are unable to identify competencies which are critical for growing the economy. There is a need for partnership that involves government, private sector, labor and management.

Key messages from private sector and civil society actors

53. The discussions and debate at the consultation forum culminated in a number of key messages which suggest a paradigm shift in education and training systems which should be a transformation from instruction to learning; acquisition of certificates and degrees to acquisition of learning that has utilitarian value for society; supply-driven to demand-driven approach; and centralized institutional management to partnership management characterized by decentralization.

54. Sustainable development in Africa requires that all stakeholders jointly formulate a vision of the continent's future. This will involve a common understanding of the issues and challenges of sustainable development; identification of Africa's potential and assets; mapping of the resources to be developed; agreement on development priorities, policies and strategies; agreement on the respective roles and responsibilities of stakeholders; and a roadmap or strategy for implementation of the vision.

55. It is imperative that reform begins in education as the instigator of change. To carry out reforms in the education system, it will be necessary to: (i) revise the regulatory framework to meet societal, economic and environmental challenges and rethink skills on the basis of regional structure and population; (ii) take advantage of institutional strengths to initiate a process of change and prepare skills for the knowledge economy; and (iii) reformulate the principles of governance to enhance dialogue and consultation.

56. Taking account of the conclusions of the ADEA 2008 Maputo Biennial, and convinced that African states need to design and develop education and training systems that will enable them to meet the challenges of their future development, the Forum participants proposed each country establish a strategic framework for the development of competencies in education and training. The framework should take account of current and future needs in terms of capacity building for communities, financial support to civil society organizations, and promotion of the private sector;

57. Public institutions, the private sector, civil society should formulate and adopt a charter of partnership-based governance for an effective education and training system. They should jointly formulate and manage education and training policies that promote economic and social integration and tackle the challenges of equity, gender, rural areas and marginalized groups. Diverse needs in technical and vocational skills training call for multifaceted responses and strategies. In order to customize responses and strategies according to diverse national needs, governments must recognize the diversity of the technical skills and vocational training required for economic growth in Africa. It is also necessary to recognize that different beneficiaries have different training needs that should be taken into consideration, including the gender dimension. Stakeholders in education and training have different strengths and therefore can play different roles. Each separate need requires an appropriate response.

58. The value chain of vocational training is everybody's business. All stakeholders in vocational training (governments and their agencies, social partners, organizations representing the private sector, economic agents) must apply themselves to the task of training young people and integrating them into the workforce, reaping the benefits individually and collectively. Vocational training systems should be designed to produce the skills needed by the private sector. Vocational training should shift from a supply-driven approach to a demand-driven approach. Vocational training should be financed through three main channels: foreign investment that promotes local development; employers and business organizations that should be given tax incentives to support training; and governments that should ensure that apprenticeship and continuing education taxes actually go toward training.

59. Re-orientation of the training system toward job-related skills is the best way to overcome the mismatch between training and employment and to optimize investment in skills development. Combating unemployment requires encouraging an entrepreneurial culture in all vocational training institutions. To confront unemployment among young Africans with higher education degrees, it is necessary to design and implement systems of support and professionalization, notably through cooperation between the academic and business worlds.

60. In order to make up for the inadequacies of African training systems, it is vital for the relations between public and private partners to adhere to good governance based on rigor, equity and transparency. Trainers in the informal economy and in rural areas should be given access to means of strengthening their technical and teaching capacity in order to improve the training they impart to young people.

61. South-South cooperation can be encouraged in terms of exchanges of information, expertise and experience among the stakeholders in vocational training in Africa; such exchanges will focus on common challenges, expectations and needs.

62. In South Africa, participants from the Department of Basic Education and the private sector deliberated on the challenges and opportunities in a real partnership for delivering and financing education. Although discussions focused on domestic issues, South African multinationals which operate in other African countries recognized their social corporate responsibilities. The messages that were formulated by the participants are consistent with the messages made by the Tunis Forum:

- a) Private sector, government and public need to develop patriotism;
- b) The private sector has programs for funding education, but it needs guidance from government on where to contribute;
- c) Even though business, government and the public have collective responsibility in education, government should engage businesses and companies beyond social development; strategic vision and alliances should be established;
- d) Government must be consistent in communicating any policy changes so that the private sector is aware and able to respond;
- e) South African companies investing in other African countries should also support educational development in those countries;
- f) Companies should support innovation and government should spend more money on research and development;
- g) The private sector should support government in addressing poor management and leadership prevailing in government schools.

Consulting with the Youth

63. The Youth Consultation Forum has been a part of the preparatory process for the Triennial because the theme of the meeting is directly relevant to youth in terms of acquisition of critical knowledge, skills and qualifications that will enable them to become active citizens and participants in the workforce of their respective countries. The Youth Forum provided youth with an opportunity to express their views on how the existing education and training systems could be reformed to respond to their employment and citizenship needs. *Youth*, as defined by the African Youth Charter, refers to “any person from 15 to 35 years of age”, making up a huge percentage of the African population. The Youth Forum consisted of a cross-section of young people in school, out-of-school, working and entrepreneurs who constitute a fair representation of African sub-regions, gender and languages.

64. Forum deliberations focused on a survey which was conducted to identify critical challenges faced by youth. The main challenges include: lack of access to quality education; unemployment; lack of entrepreneurial education; need for lifelong learning for career development and progression; life exclusion from political processes; limited partnership between education and industry; lack of

incentives for organizations to absorb young graduates from institutions; lack of access to new technologies and ICT; and limited budget for education and training.

Key messages from youth to the Triennial

65. Youth want the leaders of their countries to formulate and articulate a long term vision for the future of Africa, and an education system structured or restructured based on quality and relevance in order to allow youth to know where they come from, where they are, where they will go and how to fully play their role.

66. Education professionals should integrate history, culture and African languages in teaching and training programs to better enhance and reaffirm the identity and self-confidence of African youth.

67. It is essential that public authorities give special attention to the quality of education, notably by improving the qualifications of teachers, enhancing the teaching-learning environment, and creating tools and standards for quality control. Furthermore, there is a need to strengthen school management systems and continually and systematically monitor and review reforms to meet the changing needs of stakeholders, taking into account the realistic cultural (indigenous) and socioeconomic needs of society.

68. Public authorities should place youth employment at the center of all social, cultural and economic policies and directly involve young people in the conception of these policies. All public and private players should endeavor to invest in formal, non-formal and informal education and training schemes and pathways to the greatest extent possible so that the generation of today, facing great difficulties of transition into the world of work, does not become a sacrificed generation.

69. Public authorities must encourage businesses to actively engage in the development of alternate learning or training at all levels which will allow combined training and work experience and therefore strengthen the employability of young people. There must also be a continuous dialogue on the needs and demands of all stakeholders: the country, youth, businesses, communities, civil society, etc. Periodic discussions should be organized to regulate and adjust the education and training systems. Youth support must include all critical competencies such as managerial competencies, science and technology, entrepreneurial skills, female empowerment, ICTs at all levels, financial management and research to enable them to integrate into global knowledge societies.

70. Young Africans demand education systems which support and prepare them as agents of positive change and as active citizens; they also want to be prepared for the world of work cognizant of their diverse needs.

2.3. Sub-theme 3: Lifelong Acquisition of Scientific and Technological Knowledge and Skills for the Sustainable Development of Africa in the Context of Globalization

71. The world has entered an epoch where knowledge is a key driver of economic growth, technological advancement and sustainable development. Research has therefore assumed greater importance in the process of wealth creation. Investment in research capacity, institutions and programs has become vital in maintaining global competitiveness and innovation in the marketplace. Countries that are dominant in the global economy (USA, UK, Japan and now China) are therefore investing heavily in research capacity and infrastructure for creation of new knowledge and technologies. Research universities and institutes in these countries have become epicenters for the generation of new knowledge and innovations as they roll out new products and new processes in the global market.

72. UNESCO observed in 2005 that “Africa is a rich continent: rich in biodiversity, rich in mineral resources, rich in precious stones. It is also a continent rich in traditional knowledge, especially knowledge associated with indigenous and medicinal plants. But Africa is also a poor continent; with roughly 13% of the world’s population, it enjoys only 1% of the world’s wealth. An estimated 50% of Africa’s people live in poverty and 40% suffer from malnutrition and hunger”. Although the population is now over one billion, the situation has not changed a great deal despite the favorable economic growth that African countries have experienced in the last decade.

73. However, the picture is not bleak. As Africa enters into the second decade of the 21st century, there are indications that the continent is on a threshold of making breakthroughs in socioeconomic development. The rate of economic growth (an average of 4.5%) achieved in the last decade in most African countries indicates that the continent has put in place reforms and policies that will ensure political stability, management of economic and social programs, and structures for sustainable development. African countries have also articulated scientific and technological policies and programs to enable them to benefit from global developments in science and technology. The adoption of ICT and especially telephony technologies in Africa has been remarkable. This has enormous promise of becoming a platform for development of new innovations and entrepreneurship. It is now well recognized that science and technology are critical for Africa’s global competitiveness, vast natural resources, job creation and overall sustainable development.

74. The main purpose of this sub-theme is to identify ways and means of building and strengthening Africa’s capacity to generate, acquire, adopt and utilize scientific and technological knowledge and skills to confront the myriad and diverse challenges of sustainable development in the context of rapid globalization. The assumption of the sub-theme is that development in Africa has to be fully anchored in acquisition and utilization of high level knowledge and skills by and for its people to effectively exploit its rich natural resources to achieve sustainable social and economic development in the context of democratic transformation and through gainful engagement at the global level.

What have we learned from the analytical work?

75. Not many countries have formulated their policy priorities in terms of science, technology and innovation development plans, white papers and other strategic documents. Mozambique and South Africa have tended to follow this path. In some countries, research priorities in science and technology have tended to be defined from a sectoral perspective, for instance in agriculture biotechnology and energy as priority areas for concentration.

76. The resurgence of minerals has led to increasing interest in pursuing scientific research on minerals and technologies related to mining. This has been observed in a number of countries where mining and minerals form dominant economic activities.

77. In setting their priorities, some countries have adopted a process that brings together stakeholders to articulate a collective national vision and priorities. The process has tended to mobilize support and build an awareness of the value of pursuing policies oriented towards acquisition and utilization of science and technology for development.

78. In other instances, individual institutions responsible for research and higher education tend to articulate their visions in anticipation of funding or as a strategy for rallying stakeholders to buy-in to declared intentions and development paths. Many higher education institutions (HEIs) have adopted this process as way of cultivating and demarcating the direction they intend to move and build consensus in that way. This practice, which is commonly utilized in the private sector, has become widely adopted by research and higher education institutions.

79. The infrastructure required to produce research and technology could not be consolidated and developed because of the sharp increase in the number of universities and the inability of African governments to meet the needs of the scientific research sector when other essential priorities related to health and food had to be tackled.

80. African universities have suffered from a lack of strategic vision in terms of their differentiation policies. The number of academic institutions in Africa has continued to grow, and they have grown ever more diverse, but the differentiation of institutions has not often been planned with a view to promoting an innovation system in which the various components of the university system are complementary to one another and working to promote science and technology.

81. Another problem that hinders the development of scientific research in Africa is the brain drain. The mismatch between skills and demand, wages below expectations and the scarcity of job opportunities drive many African university graduates from their countries of origin to the developed countries. The work of the African Science, Technology and Innovation Indicators Initiative (ASTII) is ongoing but not fully developed. It initially covered only 19 of 54 countries, according to the *African Innovation Outlook 2010*, and it still needs to develop more acceptable and comprehensive indicators.

82. As for university research, it suffers from several disadvantages, including the relatively low remuneration of university professors, leading many of them to do additional work that is little related to research. Alternatively, they do research for foreign research centers for purely financial purposes. Research projects presented in the framework of cooperation with donor agencies do not always meet their criteria, and many are rejected. There is also the endemic problem of funding research in Africa: “Most SSA countries spend on average just 0.3% of GDP on science and technology—well below the 1% promised in 1980 and again in 2005.”

83. In Maghreb countries, research capacity and innovation are decreasing. Their world share of scientific publications is less than 0.2%, although research problems vary from one country to another. In Morocco and Tunisia, research takes place mainly in the public sector, although both countries have tools and mechanisms for encouraging and promoting research and development.

84. The AU Consolidated Science and Technology Plan of Action has articulated clear priority areas for Africa’s engagement with science, technology and innovation, among them biotechnology, ICT, water, energy, etc.

85. Indigenous knowledge (IK) is undervalued and as a result excluded from the teaching and learning of science in Africa. Where an attempt has been made to value IK, it is more often than not improperly integrated into the school curriculum.

86. Youth in Africa are characterized by high rates of dependency requiring high investments in education, health care and jobs. They are in all forms transitional persons. They are migrating in big numbers from rural to urban informal settlements in search of better opportunities (UNFPA 2010, 2011). They make up 40% of the African working population, but 60% of them are unemployed and underemployed, many being engaged in survival activities in the informal sector. There are no coherent holistic policies to equip youth with science and technology knowledge and skills. Some organizations like science academies, the African Technology Policy Studies (ATPS) network, etc., have started to engage youth in matters related to science and technology, but these efforts are limited in scope and coverage.

87. It has become necessary to develop quality assurance (QA) mechanisms vital to improving the quality of education and regional cooperation. QA allows for harmonization of programs, staff and student mobility. Regional recognition of qualifications is not occurring at a fast pace. In addition, there is need for clarity on what constitutes a center of excellence; that is, what are its functions expected outputs and indicators of success.

88. Universities are increasingly engaged with the productive sectors of the economy for instance in Democratic Republic of Congo, Ghana, Kenya, Namibia, Nigeria, South Africa etc.; however the modalities of engagement need to be defined more clearly.

89. Study of the emerging forms of gender and social class exclusion is critical to articulating comprehensive policies on equity. Understanding this phenomenon is limited by lack of data. Even

though recent increase of places in tertiary education went to women globally (World Bank, 2011b), this has not been the case in Africa. The expansion has hardly dented gender inequalities in most African countries, with the exception of four countries: Cape Verde, Mauritius, Namibia and Tunisia. As a result, women are underrepresented in the fields related to scholarship, research and development.

90. Continental, regional and national policy documents indicate full awareness of the benefits of regional cooperation. Regional structures have been created to accelerate integration of markets, improve trade and develop energy and infrastructure. While AU, NEPAD, UN agencies and RECs have been in the forefront in articulating the regional agenda for advancement of scientific and technological research and capacity, the persistent problem is that of implementation. Turning intentions into actions and programs remains the main obstacle to pursuing policies and programs which African countries have collectively committed to undertake. Lack of systematic funding of regional entities due to nationalism has often undermined efforts at regional cooperation.

Some policy options

91. Various policy options have been discussed. Lifelong acquisition of scientific and technological knowledge and skills may require that each African country:

- a) Make science, technology and innovation the keys to national vision. Hence, there is a need to build the capacities of policy makers to make good policies, follow them through and recognize good practices from elsewhere. Also there is need to build awareness among national leaders, policy makers and other stakeholders on the significance of science and technology for present and future development.
- b) Create a national observatory on science, technology and innovation.
- c) Build capacity for regularly updating scientific data to inform policymaking and establish a science depository center for keeping scientific and technological research data for assessing the current situation and for future reference.
- d) Increase national coordination and funding for research and development (R&D) as per continental and regional commitments of 1% of GDP.
- e) Articulate policies and strategies for capacity building of science and mathematics teachers: pre-service, in-service and continuous professional development focusing on subject content (incorporation of IK), pedagogy and practice.
- f) Increase attention to research on the status of science education at all levels: content, pedagogy and practice.
- g) Provide QA in science and technology education. Quality of science education in Africa will ultimately depend on the quality of those recruited for teacher education, quality of in-service training and professional development provided especially for mathematics and science teachers, and in numbers to meet current and future demand for the rapidly changing enrollments. QA mechanisms should validate and certify skills and knowledge acquired as well as accredit institutions.
- h) Use ICT and the Internet in teaching and learning. Distance education should target both teachers and students. ICT can enhance access to and dissemination of information as well as reduce time and cost.
- i) Cultivate a culture of innovation and entrepreneurship among the youth. There is need to strengthen and expand ICT hubs and centers as platforms where young people can explore new ideas. These centers should not only expose young people to new technologies, but also nurture their entrepreneurial skills and creativity. Public and private sector partnership is critical to the success of such hubs.
- j) Ensure and safeguard the intellectual property rights of local innovators. A lot of inventions and innovations within Africa are either underreported or pirated due to lack of clear guidelines on how to apply for patent rights. Clearly articulated guidelines on issues of patent rights will help

young African innovators to participate effectively and in a beneficial manner in national science, technology and innovation systems.

- k) Promote regional cooperation to combine effective universities with less effective universities in order to allow the more modest institutions to improve. Regional cooperation can alleviate the disparity between the various academic institutions and countries in terms of their budget allocations.
- l) Develop strategies for the development of national human resources, concentrating on the science teaching sector which is the most costly of all sectors of university education, and on specific areas defined in advance as revenue-generating. The reinforcement of a system for differentiation and articulation within post-secondary educational institutions must be harmonized with this strategic choice of sectors to be developed.
- m) Build collaborative partnerships with industrial and economic sectors to produce and strengthen capacities to utilize science, technology and innovation for sustainable development.
- n) Establish interdisciplinary research and training centers of excellence within and outside universities with emphasis on S&T and articulate benchmarks to be achieved.
- o) Increase support for post graduate training programs and postdoctoral fellows in S&T.