

Concept note and programme

2017 senior experts dialogue on science, technology and innovation and the African transformation agenda

Theme: *Higher education, science, technology and innovation and the African integration and development agenda*

I. Background

1. The Economic Commission for Africa (ECA) and the Ministry of Scientific Research of Senegal, in collaboration with the African Union Commission, are organizing a three-day senior experts dialogue on science, technology and innovation and the African transformation agenda on the theme of “Higher education, science, technology and innovation and the African integration and development agenda”. The dialogue will be held in Dakar from 28 to 30 November 2017 and is expected to have as participants approximately 50 experts from Governments, the private sector, financial institutions, non-governmental organizations (NGOs) and research institutions from within and outside Senegal.

2. For much of the twenty-first century, a significant number of the most rapidly growing countries in the world have been from Africa. Much of the growth, evidence shows, has been because of factor (labour and capital) accumulation, not total factor productivity growth. Recently, however, growth has stalled or decelerated in a number of African countries, especially in those that export commodities. The continent's three largest economies, namely, Egypt, Nigeria and South Africa, contracted and are just coming out of recession.

3. The turn of events can be attributed to a number of factors, including, a decline in commodities exports, a slowdown in imports to China and a major scarcity in foreign exchange. This reinforces what is generally known from the experience of other regions: economic development is an outcome of not only factor accumulation, but also investment in the generation of knowledge and new ideas and the innovations arising from them, which result in the creation of new or significantly improved goods and services or completely new sectors of economic activity. Africa lags in this area because of the poor state of its higher education and research and science, technology and innovation sectors. Urgent policy action by the Governments of Africa and their development partners is required to deal with this better with regard to the continent's development.

4. In the present concept note, the approach taken by ECA and its partners to address the twin challenges of the continent's suboptimally performing higher education and science, technology and innovation sectors is presented. To do that, past and ongoing work of ECA and elsewhere is taken into consideration. This note is designed to stimulate discussion and generate new ideas at the dialogue on how best to organize African higher education to create and transfer knowledge and ideas to bring about innovation and promote economic growth and transformation in Africa.

II. Senior experts dialogue on science, technology and the African transformation agenda

5. The senior experts dialogue is an initiative of ECA intended to support member States in their efforts to leverage science, technology and innovation to drive the structural transformation of their economies. The impetus for the dialogue comes from two principal sources: a general recognition that most of development challenges of Africa can be overcome through the careful and purposeful application of science, technology and innovation and a recognition by the international community that science, technology and innovation is an important means of implementation of the outcomes of recent United Nations summits, namely, the Addis Ababa Action Agenda of the Third International Conference on Financing for Development, the 2030 Agenda for Sustainable Development and the Istanbul Programme of Action for Least Developed Countries for the Decade 2011-2020, as well the African Union long-term plan for the structural transformation of the continent (Agenda 2063: The Africa We Want and the Science Technology and Innovation Strategy for Africa 2024).

6. The senior experts dialogue provides an arena for a rigorous review of policies and frameworks relating to science, technology and innovation, discussion of emerging issues in science, technology and innovation, experience-sharing and peer learning. In that role, it provides a platform for bringing forward, identifying and addressing leading issues, with the objective of enhancing the ability of African countries to harness science, technology and innovation to achieve their structural transformation and sustainable development objectives.

Table

Senior experts dialogue on science, technology and innovation and the African Transformation Agenda, to date

<i>Year</i>	<i>Hosting institution/country</i>	<i>Theme</i>
2014	Nigeria	Making science, technology and innovation work for the African transformation agenda
2015	National Commission for Science, Technology and Innovation, Kenya	Innovation hubs, clusters and parks and the African structural transformation agenda
2016	Department of Science and Technology, South Africa	Cities as hubs of innovation for Africa's transformation
2017	Ministry of Scientific Research, Senegal	Higher education, science, technology and innovation and the African integration and development agenda.

7. Notably, at the 2014 senior experts dialogue on science, technology and innovation and the African transformation agenda, the central role that higher education can play as an instrument for transformation was underscored and the Governments of Africa were urged to commit additional resources to higher education, research and development.

III. 2017 senior experts dialogue on science, technology and innovation and the African transformation agenda

8. The transition of knowledge economies has amplified interest in Africa in higher education¹ as an engine of economic growth and as the producer of the scientific and technological advancements needed to sustain innovation and power economic growth. The 2017 dialogue, which is based on higher education, science, technology and innovation and the African integration and development agenda, responds to this interest. It will explore the nexus of higher education and science, technology and innovation and the implications of this relationship for the African integration and development agenda. It will do this through two specific and related processes: an examination of the impact of information and communications technology (ICT) on higher education and scientific research and on technological innovation, and an examination of the possible impact of the establishment of the continental free trade area now under negotiation² on the structure of the higher education market in member States and on competition through innovation. Each process has implications for the supply and demand for higher education and science, technology and innovation and, therefore, for the growth, development and integration of Africa.

¹ Higher education includes all tertiary institutions. The definition and use of the concept is not limited to universities, even though the bulk of research is carried out in them.

² Put differently, the theme will be explored through regional integration in infrastructure and trade.

9. In the 2030 Agenda for Sustainable Development and Agenda 2063, it is recognized that success depends on a strengthened higher education and research sector and on the ability of countries to harness science, technology and innovation to accelerate the transformation of the continent. Those four activities, namely, higher education, science, technology and innovation, in Africa have changed with time and will continue to change.

African higher education sector

10. The higher education and research sectors of Africa presented enormous promise in the immediate post-independence years. They had political support and were reasonably well funded, and many of them were competitive globally. The situation quickly changed, however, in the 1970s and 1980s. Beset by political problems and social instability, shrinking national budgets and a high debt burden, and new claims on scarce resources arising from epidemics, such as HIV/AIDS, the Governments of Africa cut back on investment in higher education and research. In addition, there were also problems relating to internal governance at higher education and research institutions. Lastly, international finance organizations such as the World Bank focused their lending to the education sector on primary education. Arguing that the social returns to higher education were lower than the social returns to primary education, they urged the Governments of Africa to introduce fees and other cost-recovery policies in higher education. Those policies, in the countries in which they were introduced, upset the social order and worsened the situation by not only politicizing higher education, but also instigating a brain drain from the sector.

11. Higher education in Africa has changed in demonstrable ways since 2000. The number of publicly owned higher education institutions has grown, and, with it, there has been an exponential expansion in enrolments and course offerings. The State no longer has a monopoly in the provision of higher education. Private-for-profit, not-for-profit and non-governmental provision of higher education, including cross-border provisions, have become commonplace. In addition, the widespread diffusion of ICT is breaching the constraint of capacity and geography, making it possible for thousands of students who otherwise would not have had access to post-secondary education to now attain it through online courses, including through massive open online courses. Opposition to cost-recovery schemes in public universities has fallen, and there is greater acceptance of the idea that higher education in Africa needs to be reformed to make it relevant to national economic and social imperatives.

12. Many problems persist: insufficient funding; inadequate or absent research infrastructure; poor staffing; ill-prepared students; tension between research and teaching arising from rapid increases in enrolment because of high secondary school graduation rates; an absence of differentiation among universities; and weak internal governance. Specialized research institutions continue to be administered, in most cases, as extensions of the civil service. The consequence of this state of affairs is all too visible: a higher education and research sector that is failing to make an optimal contribution to the efforts to find solutions to many of the development challenges that the continent faces. Success in repositioning higher education in Africa to serve as a source of new knowledge and a driver of innovations depends on the ability and willingness of Governments to address and attenuate many of the problems still hampering the sector.

Performance of Africa with regard to science, technology and innovation

13. The above is reflected in the poor performance of Africa with regard to science, technology and innovation. Although there is evidence of significant innovation occurring in African countries, Africa performs poorly relative to other regions of the world in most

measures relating to scientific research productivity and technological innovation. African countries are largely in the bottom third of most global rankings of countries on innovation, such as the Global Innovation Index. Engineering capacity is weak, as detailed in a recent report by the Royal Academy of Engineering.³

14. Africa accounts for 2.4 per cent of the world's peer-reviewed scientific and technical publications, 0.5 per cent of all patents filed in 2016 and 0.2 per cent of the global exports of high-tech products. The share of researchers in Africa (2.4 per cent of the world's total) matches that of its publications (2.4 per cent of the world's publications), while its rather small share of global technology products may suggest the absence of firms capable of absorbing new and emerging knowledge and generating new and innovative technology products (goods and services) of global interest. This is supported by the observation that Africa is the only region where the contributions of agricultural value-added to gross domestic product (GDP) remains more than 15 per cent.

IV. Policy challenge

15. The research question of the 2017 senior experts dialogue on science, technology and innovation and the African transformation agenda is how best can African countries organize higher education in order to create and transfer knowledge and promote innovation and economic growth to advance the African integration and development agenda. Fully cognizant of the idea that innovation is a non-linear process, this question is derived from the historical conceptualization of innovation that places higher education at the earliest stage of knowledge creation and focuses on university research as the generator of ideas.⁴ The policy prescription of this model is that higher education institutions in Africa should be tasked with producing the skilled and talented workforce for this new economy, which will be characterized by the demands for knowledge and information. Researchers at those institutions will create the new knowledge, products, services and processes that will assure the competitiveness of African countries not only with each other, but also with the rest of the world.

16. Flowing from the above, the challenge for all African countries is fourfold: (a) formulate policies to revitalize higher education to position it to be a source of knowledge and ideas to foster scientific research and innovation; (b) harmonize higher education and science, technology and innovation policies to ensure that they support each other; (c) formulate policies to create market conditions and develop macroeconomic and trade policies and regulations that promote the transformation of inventions (knowledge) into the innovations required to achieve integration and development in Africa; and (d) formulate policies to manage future downside risks associated with new technologies, including their possible impact on employment and job creation.

17. As stated earlier, for the purposes of this dialogue, the focus of this report is on two processes that are expected to play an extensive role in determining the future trajectory of Africa's development: movement to a continental free trade area pursuant to the goals of the Abuja Treaty establishing the African Economic Community and increasing interconnectedness through ICT. Each process has implications for the supply and demand for higher education and science, technology and innovation and, therefore, for the continent's growth and development, and integration.

³ See *Engineering and Economic Growth: A Global View* (London: September 2016).

⁴ The definition of innovation as a non-linear process is applied for this report, but the historical conceptualization is adopted for ease of analysis.

18. A continental free trade area would spur growth through increased trade and lead to the harmonization of rules and standards related to trade. As countries compete with each other in the absence of tariffs, they seek a competitive advantage through higher-quality human capital, innovations and the creation of new sectors through science, technology and innovation. A much larger continental market potentially would encourage technology transfers, greater exploitation of economies of scale and more efficient resource allocations, driven by stronger competitive pressures. Differences in per capita GDP may spur countries with lower per capita GDP to try to advance their economies through catching-up mechanisms, leading to higher capital accumulation and transfer of technology. Technology transfer would take place through various channels, including through trade, capital flows and patent transfers, given that returns to the application of technologies that would be new for the entrant but old for the incumbents would be higher in the poorer member countries of the proposed free trade area.

19. ICT and digital infrastructure are critical for success in moving higher education forward. Increasingly, ICT is becoming the backbone of teaching in African universities and is fostering scientific research, technological progress and innovation. In some cases, ICT is making higher education independent of location, thus attenuating the constraints of capacity (in terms of admission places) and distance (thus democratizing access), which is resulting in a reduction in the unit cost of a course and enabling higher education institutions to exploit economies of scale and scope. Many African regional integration arrangements (regional economic communities) are adopting policies to promote a common, single ICT market. Telecommunications operators are making the needed investment to enable them to serve regional markets. Competition and advances in technology are reducing the cost of ICT services. Ultimately, the consequence of this growing infrastructure integration will be a much larger market for higher education and for goods and services.

V. Expected outcome

20. The expected outcome of the dialogue is a set of recommendations that will assist member States in designing higher education and science, technology and innovation policies to support the transformation of their economies pursuant to the African integration and development agenda. These may include recommendations pertaining to the following topics:

- (a) Reforming and revitalizing the higher education sector in African countries;
- (b) Ways in which higher education and science, technology and innovations could be leveraged to achieve the Sustainable Development Goals in Africa;
- (c) Possible themes for future senior experts dialogues on science, technology and innovation and the African transformation agenda;
- (d) Formulation of an ECA research programme to support higher education, science, technology and innovation and efforts aimed at achieving the Goals.

The outcome of the dialogue will be summarized in an analytical policy report, which will serve as a guiding reference for policymakers and an input into programme development of ECA. It is hoped that the report will inspire inquiry, initiate policy discussion and stimulate new ideas and policies on these pressing issues of the continent.

VI. Participation

21. Participation is by invitation only. Invitations will be extended to African ministries responsible for science, technology and innovation. Ministries responsible for higher education are requested to nominate senior policy experts to attend. Invitations will also be extended to heads of science, technology and innovation institutions, African Union departments, the New Partnership for Africa's Development, regional economic communities, selected academic institutions, United Nations agencies with pertinent mandates, multilateral and bilateral development agencies and NGOs and civil society organizations. ECA will sponsor some 35 senior policy experts from African countries. The host country will determine the composition of its delegation.

VII. Format

22. The dialogue will follow the format used by the World Economic Forum. Panellists will review the issues in an open discussion led by a moderator. There will be no formal presentations. Panellists will be requested to submit their talking points and notes to the secretariat for the purposes of preparing the report.

VIII. Date and venue

23. The dialogue will be held in Dakar from 15 to 17 November 2017.

IX. Contacts

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