

SENIOR EXPERTS DIALOGUE

On

*SCIENCE, TECHNOLOGY AND INNOVATION AND THE AFRICAN TRANSFORMATION
AGENDA*

ON THE THEME:

**“INNOVATION HUBS, CLUSTERS, AND PARKS AS DRIVERS OF AFRICA'S
TRANSFORMATION”**

Concept Note

02 to 04 December 2015

NAIROBI, KENYA



I Introduction

Science, technology and innovation feature increasingly in discourses on African development¹. There appears to have emerged a consensus that innovation hubs, parks and clusters can be an important driver of Africa's transformation. This view has in large part been driven by advances in information and communications technology (ICT) and the very low fixed cost of entry and innovation in the "soft" segments of that industry. The continent is now home to many innovation hubs, innovation laboratories, driven in large measure by the revolution in the development of applications (apps) for smartphones and rising youth rates of youth unemployment. Indeed, many African governments, development partners and civil society organizations appear to hold the view that these innovation hubs and laboratories hold the key to the continent's transformation and improved competitiveness. Many have translated this view into the establishment and financing of hubs. Some are either transforming their cities into innovation hubs and cluster (even if in name) or seeking to create entirely new cities to serve as innovation hubs.

This emphasis is not misplaced. For the past 20 years, African countries have recorded very impressive growth rates. This has generated increased optimism about the future of the continent. However, a number of forces have helped to drive this growth – a commodities boom due to increased imports from a rising China, greater fiscal space from debt relief, reduction in conflicts, factor accumulation, and improvements in the quality of economic management. However, this growth has been accompanied by a fast rising youth population and youth unemployment. The continent remains one of the least industrialized regions of the world; its economies poorly diversified, its countries nearly invisible in the export of high-technology products and in the creation and production of frontier intellectual assets. Most of the countries rank at the bottom on most measures of competitiveness and innovation. Except for a few universities in South Africa, most of the continent's universities do not appear among the first 250 in the global rankings of universities. And the gap between Africa and the rest of the world in terms of science, technology and innovation continues to widen.

African governments recognize that their ability to deal with high rates of youth unemployment and corral the immense possibilities that their youth bulge present, accelerate economic diversification and transformation while maintaining high growth rates, and break out of the middle income trap in the long run critically depends on the degree to which they contribute to advances in science, harness new and old technologies, and innovate. Most appear to believe that the creation of innovation hubs, parks and clusters is an important and critical first step.

Historical evidence lends support to this view. Innovation hubs and clusters have played a transformative role in the industrialization of countries such as China, Chile, Malaysia, Thailand and United States of America. Silicon Valley, US Route 28, Research Triangle Park, the transformation of Singapore, and South Korea are some examples. India created Software Technology Parks of India (STPs)² employed about 3.13 million workers directly, contributed 8% of GDP, and generated \$86

¹ The African Union (AU) recently adopted the Science, Technology and Innovation Strategy for Africa-2024 (STISA-2024) as the continental strategy for harnessing science, technology and innovation for Africa's transformation as a means of implementing the AU's Agenda-2063, the long-term strategy for the continent's development. Similarly, STI has been identified by the United Nations as a means of implementing the Outcomes of its recent summits, including the SDGs, the Addis Ababa Action Agenda on Financing for Development, Rio+20, etc.

² See the Software Technology Parks of India Annual Report 2013-2014 at <https://www.stpi.in/>

billion in exports of IT services and business process management (BPM) services. India has over 50 centres that are part of its STPs.

India's experience in particular makes innovation hubs and clusters an appealing proposition for African countries, hence the predominance of ICT-related hubs and parks on the continent. Mauritius is a good example in this regard. But other African countries have focused on other types of innovation hubs/clusters. Morocco for instance decided to position the country as the innovation hub for the aeronautics industry in the early 2000 (Ahmad et al, 2014). Since then, exports have grown almost 88 times. The sector employed some 8,000 workers and generated about \$1 billion in revenues in 2012. Morocco was among the top 8 global recipients of aeronautics-related foreign direct investment (FDI)³. Over 100 aerospace firms, including Boeing, Bombardier, EADS (parent company of Airbus industries), Safran and Alcoa among others, have invested in the cluster^{4,5}.

There are now many innovation hubs, technology labs, science and technology parks, incubators and accelerators, in over 20 African countries. Examples include Liberia's iLab, Nigeria's Co-Creation Hub, and Ethiopia's and Senegal's ICT incubators⁶. Proposed technology cities include Kenya's Konza city, Nigeria's Anam New City, Eko Atlantic, and Centennial, and Egypt's Mubarak City. South Africa's Science and Technology Park covers a wide range of sectors including ICT, biosciences, nanotechnologies, and green technologies. Mining is one of the many focus areas of the Botswana's Innovation Hub. While there are, based on the evidence, other innovation hubs and clusters, references to innovation hubs and clusters or parks in Africa refer invariably to ICT-driven innovation hubs such as Nairobi's iHub Innovation Centre⁷.

II Definitions

There is no generally accepted definition of innovation hubs and innovation clusters in Africa. This is largely due to the enormous differences in form, focus, structure, and business model among them. For example, South Africa's Science and Technology Parks resemble Technology Innovation Centres of the Faunhofer⁸ type while the ICT-related hub/clusters in many African cities look like low-cost apprenticeship workspaces, far removed from the frontiers of science and engineering, where young people get together, share and develop their ideas, and acquire business knowledge and mentoring

For the purposes of this Dialogue, we define innovation hubs broadly in two ways. First, as infrastructure; as a collaborative workspace where creative people come to work together, learn by

³http://www.ontaero.org/Storage/29/2375_Deloitte_presentation_11-12-2013.pdf

⁴The Africa Report.com : [Morocco matches skills and growth sectors](#)

⁵ The Government of Ethiopia is in the process of building ten (10) industrial parks to stimulate manufacturing in the context of her grand industrialization ambition see <http://www.ena.gov.et/en/index.php/economy/item/1353-ethiopia-building-industrial-parks-to-stimulate-manufacturing-industry-growth>. In the medium to long run, these industrial parks, if successful, could become drivers of innovation in the country.

⁶ There are more ICT-related hubs because of the low fixed cost of entry as well as low marginal cost. Biotechnology hubs, while also proliferating, require higher levels of skill and more expensive (research) infrastructure. Engineering innovation hubs are limited by the small size of Africa's manufacturing sector.

⁷ Nairobi's iHub has midwived the emergence of over 152 companies since it was founded in 2010 and has over 15000 members (<http://techcrunch.com/2015/07/23/the-rise-of-silicon-savannah-and-africas-tech-movement/>)

⁸ A [German](#) research organization with 67 institutes spread throughout Germany, with centres in the United States, The United Kingdom, Asia and Latin America., with each Fraunhofer Institute focusing on a different field of applied science. The Institute employs thousands of scientists and engineers and has an annual research budget of about €1.7 billion.

doing, are mentored as well as taught entrepreneurial skills. It is also a place where business start-ups are incubated, and where business deals between venture capitalist and entrepreneurs can be concluded. Second, within an organizational/institutional context, innovation hubs and clusters can be seen as intermediaries, screening devices and trust facilitating institutions whose primary purpose is to enable innovation and entrepreneurship, promote national, regional, local competitiveness and create economic and social benefits. In the context of Africa, innovation hubs and clusters may or may not be research driven⁹. Most of the hubs of policy and advocacy interest do not play the role of translating research outcomes (say university research or specialized institutions' research) into commercial products. Instead, they

While science parks, industrial parks, and other similar parks may serve as innovation intermediaries¹⁰ and screening devices, we exclude them from our concept of innovation hubs. The reason is that science parks and technology parks, unlike innovation hubs and clusters, are very formal and require very specialized professionals to manage them¹¹. Innovation clusters and parks are thus frugal organizations, hovering at times hover between formality and informality¹², that may or may not be geographically concentrated and that prosper through the exploitation of scale and network economies.

The general rationale, specific objectives and purpose of innovation hubs and clusters differ widely. But their principal is to create social and economic benefits. For some countries, the principal reason for supporting ICT-based innovation hubs was to become a regional ICT and computer hub and to attract needed investments into the area. Benefits such as increased revenues, employment, etc were to follow. Others see the hubs as an instrument to deal with rising youth unemployment and to douse social tension. Still others see innovation hubs as a strategic variable in their science, technology and innovation and capacity building strategies.

Innovation hubs and clusters differ also by funding source. Some are privately funded; a great many, especially those focused on social benefits, are donor funded while the very big ones big hubs such as Morocco's aeronautics hub or South Africa's Innovation hub are publicly funded. Algeria's ICT-focused hubs and incubators receive funding from the national government.

These innovation hubs and clusters fill a gap. They, in some ways, constitute a first step towards developing and seeding the culture of innovation especially at firm level that is lacking in many African countries. From this standpoint, innovation hubs and parks could be a tool for exploiting the advantages of late-comer industrialization through the acceleration of learning to catch-up with (and perhaps, leapfrog over) the leading countries.

⁹ Innovation hubs and clusters do not appear in triple helix models (university-industry-government) of innovation.

¹⁰ The concept of innovation intermediaries, based on the work of Howells (2006) "Intermediation and the role of intermediaries in innovation" is common in the literature on national /regional innovation systems. Dalziel (2010) "Who do Innovation Intermediaries exist?" refines the concept further. But these interpretations do not appropriately define the innovation hubs and clusters common in Africa.

¹¹ The International Association of Science Parks defines a science park as "an organization managed by specialized professionals whose aim is to increase the wealth of their community by promoting the culture of innovation and the competitiveness of its associated businesses and knowledge-based institutions"

¹² Innovation hubs and clusters are not mentioned in the Oslo and Frascati Manuals. National statistics offices do not collect data on them. Equally of policy interest for Africa is that the NEPAD African Innovation Surveys do not include innovation hubs in the sample.

The recent past has seen a proliferation of different types of innovation hubs (of the low scale type) in Africa. According to estimates from a study undertaken by BongoHive in Lusaka and supported by Fab Foundation in Cambridge, United States¹³, there are currently over 200 different types of innovation spaces and organizations around Africa, about 10 of which are official members of the International Association of Science Parks and Areas of Innovation¹⁴. African cities such as Cairo, Cape Town, Lagos and Nairobi are emerging as home to the proliferating innovation hubs. Intriguingly and unexpectedly in a region with severe social challenges, about a quarter or more of these innovation hubs have a social mission¹⁵.

III. Policy problem

Science, technology and innovation (ST&I) is a front-burner development issue for all African governments. Practically all the challenges to Africa's development are amenable to technological solutions. For this reason, a considerable amount of policy effort is increasingly devoted to promoting STI. These efforts focus in the main on "prestige" issues of university and industry research, ignoring the only innovation-focused organizations on the continent, innovation hubs and clusters.

While a lot has been written in blogs and opinion pieces on innovation hubs, clusters and parks in Africa, not much really understood about them, their contributions, if any, to Africa's transformation and how that contribution can be further enhanced¹⁶. Further, very little is known about their set-up cost (and cost structure), success rate in commercializing inventions, generating revenues, and creating employment, their intellectual property strategy and their general policy interface with government. Neither is much known about their contribution to the tax base of countries, the constraints that they face and their distributional and social consequences by gender, geography and age. In many cases, these innovation hubs and clusters are amplified physical spaces-virtual and physical-where entrepreneurs and investors (venture capitalists) meet to transact business¹⁷. Because of the enormous potential that they present, effective policies are needed to corral them to accelerate Africa's industrialization and transformation. But this critically depends on a better understanding of what they actually are and the role that they play in countries where they are present.

It is with this in view that the United Nations Economic Commission for Africa (ECA) and the National Commission for Science, Technology and Innovation (NACOSTI) of the Republic of Kenya will be organizing the second ECA-initiated Senior Experts Dialogue (SED-2015) on Science, Technology, and Innovation (STI) on the theme "*Innovation Hubs, Clusters and Parks and Africa's Transformation*"¹⁸. The Dialogue, made possible in part through the kind support of the Government of the Republic of Korea and the Kingdom of Norway to ECA, will be held at the Laico Regency Hotel, Nairobi, Kenya on 02 to 03 December 2015 in Nairobi Kenya, at the Laico Regency Hotel,

¹³<http://www.citylab.com/tech/2014/10/mapping-africas-growing-tech-hubs/381317/>

¹⁴<http://www.iasp.ws/> Membership depends on meeting the basic requirements and interest of institutions to become members. For instance, there are only 9 full members of IASP in the US of which Silicon Valley is not one.

¹⁵ Venture Capital for Africa 2015 Venture Finance in Africa Report covered about 20 sectors from computer software, Internet, e-commerce to real estate.

¹⁶ There is also very little if any academic and business research on innovation hubs and clusters,

¹⁷ As a consequence of which, there has been a significant growth in angel networks on the continent in recent times. These networks include Silicon Cape, Lagos Angels Network, Cairo Angels etc. These angels are an untapped source for financing Africa's development.

¹⁸ This builds on a 2009 Report by ECA entitled "*Technology Parks, Incubation Centers, Centers of Excellence, Best Practices and Business Model Development in Northern and Southern Africa Regions*"

with a field visit organized by NACOSTI to selected innovation hubs around Nairobi on the 04 December 2015.

IV Objectives

The main objective of the Senior Experts Dialogue (SED) is to examine how Africa's emerging innovation hubs and clusters (in the modern as well as traditional sense) can be an additional instrument for accelerating the continent's transformation. They can do so by enabling the continent to exploit the advantages of the late-comer. With this in view, the SED will explore the following issues:

- a. The terrain of African innovation hubs and clusters, structure, trends and policies, including innovation hubs and clusters as instruments for exploiting late-comer industrialization;
- b. Taking advantage of Africa's youth bulge: innovation hubs and Africa's youth;
- c. Improving the participation of women: why are there few women in innovation hubs and clusters;
- d. Special focus on ICT-driven innovation hubs and clusters;
- e. Other emerging hubs: biotechnology and life-sciences and engineering practice hubs;
- f. Cities as innovation hubs and clusters;
- g. National experiences in development, governance and performance of innovation hubs and clusters;
- h. Innovation hubs and the extant intellectual property rights regime: constraint or facilitator?
- i. What can Africa learn from others: exchange of international experience;
- j. Policy lessons in the development and management to meet Africa's development aspirations.

V Expected outcomes

The expected outcomes of SED-2015 are:

- Improved understanding of the role of innovation hubs and cluster in realizing latecomers advantages for the structural transformation of Africa's economies;
- Identification for ECA of future areas of policy and research work on the potential and possibility of innovation hubs and clusters as an additional instrument for accelerating Africa's transformation;
- A set of policy recommendations for recommendations for consideration and adoption by African governments, Africa's continental and regional organizations, the private sector and other stakeholders in Africa's development.

VI Format

The Senior Experts Dialogue is designed as two days of moderated panel dialogue, and a half day visit to Konza Technology City. All sessions will be plenary and will address the issues identified in this Concept Note. Panelists will be drawn from various sectors including government, industry, hubs, the international community, academia and non-governmental organizations. The panel discussions will be moderated by a chair with each panelist making short presentations based on their individual and institutional experiences. The panel will then take questions and comments from the audience in order to ensure the dialogue is engaging and constructive.

V Participants

Participants will consist of senior STI policy experts from Africa’s governments, the African Union Commission, Regional Economic Communities (RECs), heads of R&D institutions, economic policy experts, managers of technology and business incubators and science and technology parks, entrepreneurs and innovators, development partners, researchers and international experts from bilateral and multilateral organizations.

VII Venue and date

The Dialogue will take place on 02 and 03 December 2015 in Nairobi Kenya, at the Laico Regency Hotel. A field visit organized by NACOSTI to selected innovation hubs around Nairobi will take place on 04 December 2015.

VIII Working language

English is the working language of the SED.

IX Contacts

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About the Senior Experts Dialogue (SED) on Science, Technology and the African Transformation Agenda

The Senior Experts Dialogue (SED-ST&I) on Science, Technology, and Innovation (ST&I) and the African Transformation Agenda is an initiative of the United Nations Economic Commission for Africa (ECA) designed to support the goal of African countries to much more effectively and deliberatively harness science, technology and innovation to achieve their development objectives. It provide a forum for learning and experience/knowledge sharing, and the articulation of policies. It also serves to strengthen the domestic constituency of science, technology and innovation in ECA Member States. Participants include international experts, senior government policy makers, and experts from the private sector, academia, bilateral and multi-lateral organizations. The outcome of SED are a set of policy recommendations that African governments may consider and adopt in order to accelerate the transformation of their economies. Member states volunteer to host and co-organize the SED. The first SED was hosted by the Government of the Federal Republic of Nigeria and the second by the Government of the Republic of Kenya. The African Union Commission supports the SED as an additional instrument for the realization of the objectives of its Science, Technology and Innovation Strategy for Africa-2024 (STISA-2024).

Annex 1: List of select African innovation hubs, clusters and parks

Country	Names and location	Ownership	Number of tenants	Focus
Algeria	Technopole of SidiAbdallah (SA) <ol style="list-style-type: none"> 1. Technopark El Boustène 2. Technopark Ibnou-Sina (IS) 3. Cyber Park (CP) 4. Park of SidiBennour 	Government		<ol style="list-style-type: none"> 1. ICT Electronics, Biothechnology (pharmaceutics) 2. Biotechnology, health care & medicine, ICT, Tourism ,Engineering 3. ICT, Media & communications 4. Agrofood
Angola	Luanda Science and Technology park			
Botswana	Diamond Technology Park in Gaborone	Government	+27	Diamond industry (supply-chain cluster)
	BIH Science and Technology Park	Government	+9	Biotechnology, energy & environment, ICT, mining technologies
Cape Verde	Cape Verde Technology park	Government		Waste management, ICT, Business & ICT incubation
Cote d'Ivoire	Technopark Africa	Private		Biotechnology, nanotechnology, clean energy, biopharmacy
Egypt	Sinai Technology Valley	Government	+9	ICTs, Microelectronics, Biotechnology, New materials, Fine tools, Renewable energy
	Mubarak City for Scientific Research and Technology, Alexandria	Government	+12	Biotechnology, ICT, Advance engineering, Nanotechnology
	Smart Village, Giza	Government		ICT
Ethiopia	Ethiopia ICT Park	Government		ICT
Ghana	Hope city	Private		ICT
	Tema ICT Park	Government		ICT
Mauritius	Ebene Cyber City	Government		ICT
	Rose Belle Business Park	Government		Manufacturing, Construction, light engineering
Morocco	Technopole de l'Aéroport Mohammed V			
	Casablanca Technopark		+97	ICT
	Bouznika Technology Park (BTP)			ICT

	Morocco Aerospace Cluster			Aeronautics(supply-chain cluster), R&D
Mozambique	Maluana Science and Technology Park	Government		Research education hub, ICT business incubator
Nigeria	Africa Premier Innovation Corridor (APIC)	Government		
Rwanda	Kigali ICT Park (KICT)	Government	+6	ICT
Senegal	Technopole de Dakar			Advanced Engineering, Agro-Food, Energy, Health Care & Medicine, ICT (software development)
	Dakar Technopolis (DTP)			Agrofood, energy, health care & medicine, ICT (software development)
South Africa	Technopark Stellenbosch	Government	+220	Advanced Engineering, Agro-Food, Energy, Health Care & Medicine, ICT (software development)
	Softline Technology Park (STP)	Government	+7	IT (accounting, payroll and CRM software solutions), Services (technical and sales support, conference services)
	Highveld Techno Park (HTP)	Government	+15	Advanced Engineering, Electronics, ICT, Services (business development and support services, statistics)
	Innovation Hub Science Park (IHSP), Pretoria	Government		ICT and advance manufacturing, biosciences and green economy
	Coega Technology Park (CTP), Port Elizabeth	Government		Advanced Engineering (minerals technology and research, automotive component manufacture), ICT (banking)
Tanzania	Tanzania ICT Technology Park	Priv/Government		ICT, ICT incubation
	Small Industries Development	Government		Business support, ICT, Technology transfer
Tunisia	Borj Cedria Science and Technology Park			Energy, Environment, biotechnology
	Elgazala Technopark (3 sites, El Gazella, Manouba, Ennahli)		+24	ICT
	Sfax Technology Park (STP)		+4	Electronic & ICT, advance engineering
	Sousse Technology Park (SOTP)			Advance engineering, electronics, ICT

	Technopark of Bizerta (TPB)			Agrofood
	Technopark of Sidi Thabet (TST)			Biotechnology & pharmaceutical industries
Uganda	Lake Victoria Information Communication Technology and Bio-tech Park (LAVIT park)			ICT, biotechnology
Zimbabwe	National University of Science and Technology Technopark (NUST)	Government		Business & ICT incubation