

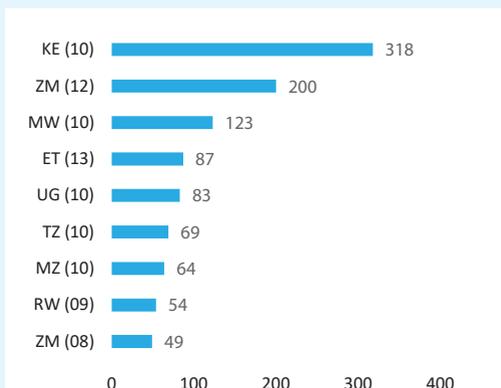
Context

Many countries in Sub-Saharan Africa (SSA) have registered robust economic growth in the past decade. Their commendable economic progress has been driven by an improved business environment, domestic production and consumption power, and increased trade and investment in sectors such as agriculture, extractives, construction, services, information and communication technology (ICT), and tourism. As part of SSA, the Eastern and Southern African (ESA) countries have enjoyed similar development. To sustain this growth and transform their economies to the next level of development, the ESA countries must now rely more on higher level skills and knowledge, with a focus on science, technology, engineer-

ing and mathematics (STEM).

However, the region does not produce enough graduates in science and technology fields that it needs to expand and diversify its economy. Evidence suggests that firms in ESA face difficulties in filling technical and managerial positions as the proportion of researchers and expertise in ESA countries are inadequate (Figure 1). Yet, many university graduates are not able to find jobs due to the low quality and relevance of their education and training. Research outputs and researchers in SSA contribute less than two percent of the global research output. These deficiencies are more common in five regional priority areas: Industry, Agriculture, Health, Education and Applied Statistics.

Figure 1: Researchers in ESA per million inhabitants (headcount)



Source: UNESCO Science Report: Towards 2030 (2015)

A Regional Approach as a Solution

Regional specialization and coordination of investments is an important way that ESA countries can financially and academically develop quality provision of higher education in this broad range of disciplines. For example, it is not efficient for all the countries with a growing oil and gas sector to invest in their own international top-level petroleum engineering program. On the other hand, the scale of the need for highly-skilled and specialized labor in the region is so large that it is unsustainable to send most post-graduate students abroad for training. Hence, there is a strong need for the region to develop its existing human and financial resources for a few specialized regional centers with an explicit mandate of offering higher quality education and relevant research to serve the needs in the region.



The Eastern and Southern Africa Higher Education Centers of Excellence Project (ACE II)

The ACE II, an initiative of participating African governments and the World Bank has established 24 Africa Centers of Excellence (ACEs) – in areas of Agriculture, Health, Science and Technology and Applied Statistics and Education – which will build and sustain excellence in higher education and bridge skill gaps in the human resources required to address the development needs of the region. The ACE II is designed to identify and address higher skills and innovation requirements for priority sectors in the region. It is also aligned with Eastern and Southern African Countries' strategy to strengthen competitiveness and employment in Africa through the production of quality high skilled human resources in priority growth sectors.

A regional specialization of higher education through the ACEs will:

- (i) concentrate the limited available top-level faculty into a critical mass that can attain academic excellence;

- (ii) establish and sustain the necessary number of centers of excellence to support the region's demand for specialized human capital and knowledge at lower unit costs; and
- (iii) generate increased knowledge and flow of students across borders.

What will ACE II achieve?

The Project's objective is to strengthen the selected ACEs to deliver quality post-graduate education and build collaborative research capacity in the regional priority areas of Industry, Agriculture, Health, Education and Applied Statistics. These priority areas were defined by the project's Regional Steering Committee after broad consultations with leadership from ESA countries.

The proposed ACE II project will support the governments of eight participating countries – Ethiopia, Kenya, Malawi, Mozambique, Rwanda, Tanzania, Uganda and Zambia. Burundi, which does not host any ACE, is eligible to access services offered by the ACEs in other countries and regional capacity-building activities under the project.

ACE II will implement three initiatives

1. Strengthen Africa Centers of Excellence (ACEs) in Regional Priority Areas.

Each of the 24 specialized regional centers will receive a grant of up to US\$6 million over the project duration of five years.

The ACEs are expected to produce measurable results in the form of increased quality and quantity of graduates, quality and quantity of research, and increased collaboration and partnerships with industry and other higher education institutions in the region and internationally.

2. Capacity building support to ACEs through Regional Interventions.

The project will provide forums for industry-academic engagement for ACEs to highlight their work and brainstorm on collaborative research ideas, as well as facilitate capacity building workshops in areas such as crafting contract and legal agreements, patent application, etc.

This component also includes the ACE Scholar-



ship Program where 30 regional students in STEM will be financed for two years to attain a Master's degree in any of the ACEs.

3. Facilitation, coordination and administration of project implementation to be implemented by a Regional Facilitation Unit (RFU). The Inter University Council for East Africa (IUCEA) is the RFU. The RFU will deliver capacity development activities, explore networks of regional institutions and industries within and outside of the ESA region and manage Technical Assistance firms.

Unlike many existing institutions in the region which focus primarily on academic research, the selected ACEs under ACE II will produce real impact in terms of addressing a specific challenge in one of the priority areas in the region.

ACE II Activities

Each ACE is expected to encompass the following five interrelated elements:

(a) Enhancing capacity to deliver high quality training in the region to produce skilled personnel needed for

addressing a specific development challenge defined in the regional priority areas

(b) Enhancing capacity to deliver applied research to find solutions for addressing a specific development challenge defined in the regional priority areas

(c) Building and strengthening academic collaboration both within and outside the ESA region to raise the quality of education and research in the specialized priority discipline

(d) Building and using industry/sector partnerships to enhance the impact on the chosen priority area through improved relevance of training, research and outreach of the ACE

(e) Strengthening monitoring and evaluation to improve governance and management of the ACE and its hosting university.

According to their proposals, over the project duration of five years, collectively these ACEs plan to:

- Enroll more than 3,500 graduate students in the regional development priority areas, out of which more than 700 will be

PhD students and more than 1,000 will be female students;

- Publish almost 1,500 journal articles;
- Launch more than 300 research collaborations with the private sector and other institutions; and
- Generate almost US\$30 million in external revenue.

Project Beneficiaries

- (a) Students in participating universities and their partner institutions will benefit from high quality education and training in regional priority areas.
- (b) Employers in targeted sectors/industries will have greater access to high quality/skilled personnel, results of applied research, and scientific knowledge for productivity improvement; as well as knowledge partners (including companies, governmental or non-governmental organizations) will use research produced by the ACE.
- (c) Communities in which the ACEs reside will benefit from improved

educational and research outreach of the ACEs, particularly primary and secondary schools.

- (d) Faculty and staff in the ACEs will benefit from improved teaching and research conditions and professional development opportunities.
- (e) Regional institutions such as EAC and SADC will benefit from improved capacity of the ACEs.
- (f) Faculty and students in STEM and other priority-sector disciplinary areas will benefit from exchange visits, collaborative teaching and research, and other knowledge sharing activities across the ACEs organized by the Regional Facilitation Unit.
- (g) ACE hosting universities will benefit from the strengthened capacity of their ACEs, and quality improvement measures including benchmarking with other institutions initiated under the project.

Linking Achievements with Results

The Inter-University Council for East Africa (IUCEA) will provide independent verification of the results achieved and presented by each ACE for timely disbursement. The results achieved by the ACEs will be verified independently for disbursement. Independent verifiers will be hired by IUCEA to verify the results for all the ACEs in every six months during the project implementation. The project will only disburse funds to an ACE for its achieved results that have been verified by an independent verifier. The detailed results verification process can be found in the draft Project Operational Manual. During the mid-term review of the project implementation, the Disbursement Linked Indicators/Disbursement Linked Results and their allocation amounts as well as any issues related to undisbursed funds will be reexamined.

How is ACE II Governed?

The project activities will be implemented by the selected ACEs with support from

their respective host universities. The individual ACE is responsible for strategic planning, proposal implementation, financial management, monitoring and evaluation and reporting.

National Steering Committee (NSC): Each participating government will constitute a National Steering Committee (NSC) through the ministry responsible for higher education to support and supervise the project at the national level.

Regional Facilitation Unit (RFU): The Inter-University Council for East Africa (IUCEA) provides overall coordination, facilitation and administration to the project as well as capacity building support to the ACEs.

Regional Steering Committee (RSC): The RSC provides overall guidance and oversight to the project, and ensures that the ACEs achieve their development objectives. It has already made the conditional selection of the 24 ACEs based on recommendations from an Independent Evaluation Committee.



ACEs selected under the ACE II Project

Country	Name of Africa Center of Excellence (ACE)	Institution
 <p>ETHIOPIA</p>	<p>African Center of Excellence for Climate Smart Agriculture and Biodiversity Conservation (Climate SABC) will conduct training and applied research in climate smart agriculture and biodiversity conservation.</p>	Haramaya University
	<p>Center for Innovative Drug Development & Therapeutic Trials for Africa (CDT-Africa) will support equitable access to interventions (medications, diagnostics and other interventions) and bring about sustainable development in Africa through high quality capacity development for innovative drug discovery in a regional platform.</p>	Addis Ababa University
	<p>ACE for Water Management (ACEWM) was established to address the need for development of highly skilled human resource capable of handling more complex water management problems in a holistic, integrative and transformative approach.</p>	Addis Ababa University
	<p>African Railway Education & Research Institute (ARE-RI) will train African students in railway disciplines under the foundation of an already existing Railway Engineering Center.</p>	Addis Ababa University
 <p>KENYA</p>	<p>Center of Excellence in Sustainable Agriculture & Agribusiness Management (CESAAM) will contribute to regional food security by focusing on technical capacity development, innovative agricultural research, incubation and transfer of technologies and creation of knowledge centers.</p>	Egerton University
	<p>Sustainable Use of Insects as Food and Feeds (INSE-FOODS) overall objective is to address challenges of sustainable food security using insects for food and feed.</p>	Jaramogi Odinga Oginga University of Science & Technology
	<p>Center of Excellence in Phytochemicals Textiles and Renewable Energy (PTRE) will support the training of postgraduate students to work in textile related industries and in research and education.</p>	Moi University

 <p>MALAWI</p>	<p>Aquaculture and Fisheries Science (Aquafish) Center of Excellence will employ innovative, entrepreneurial and multidisciplinary approaches to training, research and outreach on production, value addition and fisheries management, through strategic south-south and north-south partnerships with advanced knowledge institutions and other higher education stakeholders.</p>	<p>Lilongwe University of Agriculture & Natural Resources (LUANAR)</p>
	<p>African Center for Public Health and Herbal Medicine (ACEPHM) aims to improve human public health through the development of capacity in public health practice and research and herbal medicine.</p>	<p>Malawi College of Medicine – University of Malawi</p>
 <p>MOZAMBIQUE</p>	<p>Center of Studies in Oil and Gas Engineering and Technology (CS-OGET) aims to be a training center of excellence and reference in oil & gas engineering that assists the country and the region to fill the gap in building national skills in the field of oil & gas.</p>	<p>Universidade Eduardo Mondlane</p>
 <p>RWANDA</p>	<p>African Center of Excellence in Energy for Sustainable Development (ACEESD)'s goal is to maximize economy-wide investment in energy efficiency and eventual transition to renewable and low-carbon energy.</p>	<p>University of Rwanda – College of Science & Technology</p>
	<p>African Center of Excellence in Internet of Things (ACEIoT) aims to educate and train African researchers in the field of IoT, who will develop and deploy innovative IoT-enabled services.</p>	<p>University of Rwanda – College of Science & Technology</p>
	<p>African Center of Excellence for Teaching and Learning Mathematics and Science (ACEITLMS) will aim at strengthening human capacity to deliver research-based quality teaching and learning of mathematics and science.</p>	<p>University of Rwanda - College of Education</p>
	<p>African Center of Excellence for Data Sciences (ACE-DS) will serve as a central data repository for the region, enabling the co-creation of innovative solutions to support the national and regional development challenges.</p>	<p>University of Rwanda – College of Business & Economics</p>

 <p>TANZANIA</p>	<p>African Center of Excellence for Innovative Rodent Pest Management & Biosensor Technology Development (IRPM&BTD) will incorporate biosensor technology using trained rats for land mine detection to free mine afflicted lands in Africa and elsewhere.</p>	Sokoine University of Agriculture
	<p>Southern African Center for Infectious Disease Surveillance (SACIDS) is to address infectious diseases through a collaborative effort between natural and social sciences to advance the understanding of interactions between humans, animals and the environment to improve public and animal health.</p>	Sokoine University of Agriculture
	<p>Water Infrastructure & Sustainable Energy Futures (WISE-Futures) aims to contribute to the transformation of Africa's economies by assembling a critical mass of highly skilled water, sanitation, and energy professionals who are able to deliver cutting edge research and innovation in the sector.</p>	Nelson Mandela African Institution of Science & Technology
	<p>Collaborating Center for Research, Evidence, Agricultural Advancement & Teaching Excellence & Sustainability (CREATES) aims to serve as an African Centre of Excellence for provision of post graduate training, applied research and outreach programs for food and nutrition security in the ESA region.</p>	Nelson Mandela African Institution of Science & Technology
 <p>UGANDA</p>	<p>Makerere University Regional Center for Crop Improvement (MaRCCI) will provide the region with industry-ready plant breeders who can use cutting-edge science to develop and deliver new food crop varieties.</p>	Makerere University Kampala
	<p>Center of Materials, Product Development & Nanotechnology (MAPRONANO) will utilise nanotechnology to solve problems in the areas of energy, oil and gas production, medicine, material and product development and environmental applications.</p>	Makerere University Kampala
	<p>African Center of Excellence for Agro-Ecology & Livelihood Systems (ACALISE) will contribute to Agro-ecological and sustainable livelihood systems' research and technological innovations.</p>	Uganda Martyrs University
	<p>Pharm-Biotechnology & Traditional Medicine Center (PHARMTRAC) aims to build a critical mass of specialized and skilled human resource that can advance traditional medicine and Pharm-Biotechnology for socio-economic development of Africa.</p>	Mbarara University of Science & Technology

	<p>Center of Excellence for Emerging and Zoonotic Diseases (ACEEZD) will endeavor to understand the natural history of some infectious diseases, through new evidence-based, cost effective, multi-disciplinary, multi-sectoral and collaborative strategies.</p>	<p>University of Zambia</p>
<p>ZAMBIA</p>	<p>The Copperbelt University Africa Center of Excellence for Sustainable Mining (ACE-SM) will produce skilled professionals in STEM, Medicine, Health and Occupational Safety, and Business and Resource Development and Management for Sustainable Mining.</p>	<p>Copperbelt University</p>



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