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ACE II Newsletter

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Responding to market needs

The Makerere University Regional Centre for Crop Improvement (MaRCCI) is leading the charge in developing agricultural professionals with the skills to appropriately respond to market needs.

By Agnes Ant Ambo

MaRCCI has been credited for a training programme that is responsive to the demands of the labour market. Makerere University Vice Chancellor Prof. Barnabas Nawangwe has applauded the Government and the World Bank for entrusting the university with the mandate to train scholars in research and innovation in order to address issues of food security in the country by establishing MaRCCI.

According to the former principal, College of Agricultural and Environmental Sciences, Prof. Bernard Bashasha, MaRCCI has added great value to the college, which has elevated its graduate training capabilities of the University.

MaRCCI Director Dr. Richard Edema (pictured), says: “In order for Africa to keep up with the escalating developments, training institutions, like universities, need to review the kind of curriculum they use to suit the changes in the world. The kind of tools being used are getting modernised and science, which is the driver of economic growth, is also getting sophisticated. We reviewed the curriculum to make it appropriate and responsive to the labour market,” Edema says.

The programmes that have been revamped and now re-accreditated by National Council of Higher Education (NCHE) included a master’s in plant breeding and seed systems and PhD in plant breeding and biotechnology. The university launched these two programmes in 2008 to be done by coursework and research. “We thought it was a better way to ground a student well in the discipline of crop improvement. Under these programmes, we decided to give students excellent theoretical and hands-on background,” Dr. Edema says.

After 15 years of implementation, the university recently evaluated the programme to assess how the scholars were performing in the field. This, Edema says, attracted more support for the university.

Edema says due to the uniqueness of the training programme, several international institutions have expressed interest in partnering with MaRCCI.

The university is committed to making the training programme known beyond the region.

In addition, the university has indicated interest in the establishment of a centre of excellence to develop and implement the technologies in the region.

The programme has the potential to contribute to the country’s food security and food self-sufficiency, and it is in line with the National Development Plan II (2019-2024) and Vision 2040.
In this regard, three postgraduate students have been carrying out scientific investigations into fish diseases and bacteria pathogens that infect fish in Lake Kariba. The fieldwork research involved collection of samples from fish grown in cages found in Lake Kariba.

In a quest to come up with preventive and treatment measures for fish diseases, the two Masters students and one PhD student visited the Banana Bary Fish Farm on the shores of Lake Kariba to collect fish samples from sick fish. The samples are collected to isolate and identify bacteria associated with disease and then formulate a vaccine against the diseases and other bacterial infections. The three students are Dr. Siamujompa Mazuba, (Masters student in Aquatic Animal health), Dr. Frederick Chitonga Zulu (Masters student in Aquatic Animal health) and Dr. Chanda Chitala (PhD student in Aquatic Animal health).

ACEIDHA Supports Research in Vaccines for Fish Diseases

The fish industry in Africa is facing challenges as a result of emerging fish diseases caused by bacteria. In order to address these challenges, the Africa Centre of excellence for Infectious Diseases of Humans and Animals (ACEIDHA) in the School of Veterinary Medicine at the University of Zambia has embarked on research to identify bacteria pathogens that are affecting the aquaculture business on Lake Kariba in Zambia in conjunction with the Fish Innovation Lab at Mississippi State University.
This scientific investigation in fish diseases and associated pathogens would greatly contribute to the development of the aquaculture business and industry in Zambia and on the African continent. The development of a vaccine would enhance the aquaculture business by reducing fish mortality.

Meanwhile, ACEIDHA Centre Leader, Prof Bernard Hang’ombe, who accompanied the students and their supervisors reiterated the Project’s commitment to supporting impactful and innovative research. He said that ACEIDHA has been supporting efforts to address the challenges brought about by infectious diseases through training and research since its inception in 2018 with funding from the World Bank and now through the USAID funded fish innovation Lab in the United States of America.

The Centre Leader expressed gratitude to Fish Innovation Laboratory which financed the students’ sample collection exercise. Further, the students appealed to the Government and the corporate world to come on board and support research such as this one in order to improve the aquaculture industry in Zambia and on the continent.

https://aceidha.unza.zm/
The Guest of Honour, Dr. Francis Michael, Permanent Secretary, Ministry of Education, Science and Technology, United Republic of Tanzania, said that the Centers of Excellence have a role to play in leading Africans towards the Africa we want. He called for sustainability of the program. "Both the World Bank and the governments should ensure that the program is sustained. The governance structures we have built around the centers and the results based financing model that the Centers use must be maintained and expanded for use by other entities in our universities," he said.

The Executive Secretary, Inter-University Council for East Africa (IUCEA), the Regional Facilitation Unit for ACE II, Prof. Gaspard Banyankimbona, said that the TAM is about taking stock of the achievements to date and making the required improvements to achieve the intended project objectives.

“One of our expected outcomes from the ACEs was to create a sustainable university-industry partnership for technology transfer. We may ask ourselves some questions - how far have we gone with our incubation centers, how sustainable will our Centers be after the project lifetime just a year from now. The meeting is expected to discuss those issues and guide the Regional Steering Committee to make informed decisions on the way forward,” said Prof. Banyankimbona.

The discussion at the 14th TAM largely dwelt on sustainability and the innovative activities the Africa Centers of Excellence (ACEs) are engaged in to raise revenue...
and become sustainable beyond government support that will end in December 2023. ACES have innovated a wide range of products from research that are ready for commercialization. They have started projects to raise revenue such as breeding programs to generate quality seed varieties, establishment of incubation centers and innovation hubs, tailor made short courses, bench fees from laboratories and other center facilities, and academia-industry collaborative research grants.

The Africa Center for Water Management (ACEWM) at Addis Ababa University is in a partnership with NORAD on a WASH project. ACEWM is also executing a WASH related consultancy with the Ethiopian Ministry of Education in addition to other consultancies in capacity building. The Center has generated about $1.1 million over five years. To firm up its sustainability ACEWM has developed an institutionalization framework that aims to place the center within the Addis Ababa University framework.

The Center of Excellence in Phytochemicals, Textiles and Renewable Energy (PTRE) in Kenya continuously responds to calls for funding, charges a bench fee to students and researchers using the Center’s equipment for research. PTRE has developed a range of products and is actively commercializing the products. The center has generated $2.9 million over the last five years.

“We have a product that we have tested in the supermarkets – sorghum bread with no gluten and good for diabetics. The baking is done by the supermarket. The challenge now is how to roll it out to other supermarkets,” said Prof. George Owuor, Center Director for the Center of Excellence in Sustainable Agriculture and Agribusiness Management (CEESAM) at Egerton University.

The Africa Center for Sustainable Mining (ACESM) at Copperbelt University is anchoring its resource mobilization on the development of mining analytical services.

“We are building analytical laboratories that will provide services to the mining industry. Those laboratories have to be of a high standard to support teaching and research as well as revenue generation. We will charge fees from mining companies to undertake research there. We are already offering those services to artisanal miners and we are able to raise about $3,000 a month. ACESM is in collaboration with the Center of Excellence for Battery Research in the Democratic Republic of Congo. The government of Zambia and the DRC have an MoU to undertake research and development of car batteries. The two Centers will work together and drive that research. The project will get support from UNECA,” said Dr. Mwansa Chabala, Center Director, ACESM.

“Our continuity is dependent on the health problems that we outline and we try to show the importance of these health problems to government as the major investor in these programs,” said Prof. Bernard Hangombe, ACEIDHA, University of Zambia.

The Center for Innovative Rodent Pest Management and Biosensor Technology Development (IRPM&BTD) has made AntiFert, a novel technology that is a hormonal bait formulation for fertility control to prevent rodent outbreaks. The product is registered in Tanzania by the Tropical Pesticides Research Institute, the government agency that registers pesticides. The center is now searching for a company that can produce this product for the market.

The Africa Center of Excellence for Public Health and Herbal Medicine (ACEPHEM) in Malawi is in a collaboration with an Israeli company to extract cannabis and develop different medicines. They are already conducting clinical trials with cannabis products.

The Center for Studies in Oil and Gas Engineering and Technology (CSOGET) received in-kind grant of licenses for reservoir modelling and simulation worth $22 million.

The Makerere University Center for Crop Improvement (MaRCCI) has established a seed testing laboratory whose aim is to support the seed business and reduce counterfeits as well as support training of students and industry professionals.

Calls for financing of Phase II

The Center Directors and Vice Chancellors were in consensus that while they have done a lot and even exceeded expectations, the ACES need another phase of funding to consolidate the gains made. The ACES are supported by their governments with financing from the World Bank.

“A second phase can be instrumental in funding the capacity building and some of these startups. We should strongly convince our governments to consider supporting a second phase the way Malawi and Mozambique have done. Such that we can earn some royalties from the patents that we have filed,” Prof. Ambrose Kiprop of PTRE at Moi University.

The Center Leader, MAPRONANO, Prof John Baptist Kirabira, said that while Centers have been able to raise funds, these come with their own objective and cannot sustain a Center and its recurring expenditures like salaries. “These funds are complementary, tuition is not a direct income to the Centers,
the money goes to the university. We still need support for phase two to sustain and create impact.”

“There are products and research outputs which are commercially viable. The elements are there but what we have been doing in Phase One is a lot of progress that needs to be consolidated and made even better with additional funding for Phase Two,” said Dr. Richard Edema of MaRRCI.

Prof. Celestino Obua, Vice Chancellor, Mbarara University of Science and Technology noted that what the ACEs have been doing in Phase One of ACE II needs to be consolidated. “It is nice to do research and publish, funders expect you to innovate something and sell it. Centers that are not thinking of innovations will forever be asking for more funds. Think, what is it we are going to research on from which we can develop IPs and commercialise,” said Prof. Obua.

“After the [World Bank] funding ends and our Centers are integrated in the University structure, are our university structures ready for commercialization? There are tools which drive commercialization. If you look at our colleagues in the western world, there are companies neighbouring with universities which came out of research output as spin-off and spin-out. That is the biggest gap,” said Prof. Jameson Mbale from the Copperbelt University.

In his closing remarks, Prof. Goolam Mohamedbhai, the Chairperson of the ACE II Regional Steering Committee, the oversight body for the project, noted that the achievements of the project are remarkable.

“We must admit it was mainly the efforts of the ACEs themselves. It took them time to understand what we’re talking about, but they did it, and they kept on improving as we moved along, so lots of the credit must go to the ACEs, to the leadership of the ACEs and to the leadership of the institutions,” he said.

He also noted that the issue of sustainability has come up again and again.

“But the main objective should be the hard work that has been done over the past four, five, six years, that we do not lose those efforts, whatever is done about the ACE, the achievements are there, and they are not lost and should be passed on to the institution,” said Prof. Goolam.

Prof. Goolam reiterated that the ACEs were winning the race.

“Let’s hope that when the story of the ACEs is written one day, when they write about the history of higher education in Africa, ACE II is mentioned there as a chapter. It is a very successful chapter and one that all of us take pride to read.”
Progress on Establishment of Academic Networks

In June 2021 during the 11th Technical and Advisory meeting, the Africa Centers of Excellence established academic networks by priority sector (health, industry, agriculture, and education and statistics). Academic networks are considered to be a way forward for ensuring the sustainability of the ACEs.

ACEs were keen on undertaking joint activities such as organisation of regional conferences, community engagement activities, writing joint proposals, faculty and student exchanges, among others. What is the progress?

Agriculture

According to Prof George Owuor who coordinates the Agriculture cluster, the ACEs in this cluster have a WhatsApp Group through which they exchange ideas on how to undertake collaboration including co-supervision and collaborative research. CESAAM at Egerton, INSEFOODS at Jaramogi Oginga Odinga University of Science and Technology, MARRCI at Makerere University, PHARMBIOTRAC at Mbarara University of Science and Technology, CREATES and Wise Futures at Nelson Mandela Institution of Science and Technology have at different occasions undertaken joint activities, namely:

1. Joint Summer School hosted at Egerton University in 2019/2020 held by CESAAM, MARRCI, INSEFOODS, and CREATES.
2. Staff and students exchange in 2021/2022 between INSEFOODS, MARRCI, CESAAM and PTRE.
3. Joint Capacity building on writing fundable proposals by Virginia-Tech with CREATES, CESAAM, MARRCI, University of Rwanda and University of Burundi.
4. Joint Conference and Exchange in the United States at Virginia-Tech USA and at the Global Agricultural Productivity report launch held in Washington DC involving CESAAM, MARRCI, ILRI and the hosts Virginia-Tech. The interaction involved exploring joint curriculum development on communicating science, Agri-Enterprise Development, Crop...
Protection and crop breeding programmes.
5. Joint Short Courses development, co-hosting and co-supervision.

ACALISE has had a number of academic exchanges and benchmarking visits with PTRE (Moi University) and PHARMBIOTRAC (Mbarara University of Science and Technology). The Principal Investigator visited CREATES and WISE FUTURES at Nelson Mandela Institution of Science and Technology and an MoU has been drafted to guide mutually beneficial activities.

Health

The Health cluster including PHARMBIOTRAC, CDT-Africa, ACEPHEM and the Africa Centre of Excellence in Phytomedicine Research and Development (ACEPRD) from ACE 1, submitted a joint proposal to the European Union’s ACP Innovation Fund in January 2020 with the title: Harnessing the potential of traditional medicine in health for socioeconomic transformation in Eastern Africa. The proposal was to create an innovation hub with about eight innovation centers. While it was not successful, the health cluster team will continue to collaborate on different activities.

Education and Statistics

The Education and Statistics sectors have two Centers of Excellence namely, African Centre of Excellence for Innovative Teaching and Learning Mathematics and Science (ACEITLMS) and the African Centre of Excellence in Data Science (ACE-DS). The two worked together on various activities.

1. ACEITLMS and ACE-DS have organized joint Academic writing and Research Proposal writing training for postgraduate students where a professor from Birmingham City University facilitated the training.
2. The Centres have shared experiences on developing Strategic Plans for Sustainability of the Centers.
3. Jointly, they have conducted monitoring and evaluation, postgraduate supervision, and the development of a communication strategy to ensure the visibility of both Centers.
4. ACE-DS provided technical support to the ACEITLMS to develop a website at the initial stage of the Centre.

Planned activities

Both centers wish to continue to collaborate in the following activities: organization of joint conferences/seminars, monitoring and evaluation, postgraduate supervision, communication and visibility of the Centers and development of Sustainability Plans.
The objective of PHARMBIOTRAC is to build a critical mass of specialized and skilled human resource that can advance traditional medicine and Pharm- Biotechnology for the socio-economic development of Africa. Traditional medicine, a key component of the PHARMBIOTRAC goal, is largely composed of herbal medicines derived from medicinal plants which have been used for thousands of years.

The WHO has encouraged the use of traditional medicines for over four decades now. In addition, inefficient and inadequate health facilities and other social services in developing countries have driven rural communities to widely rely on medicinal plants. Thus, there is a tremendous surge in acceptance and public interest in natural therapies both in developing and developed countries, with these herbal remedies being available not only in drug stores but now in food stores and supermarkets. However, this has resulted in an increased risk of extinction of medicinal plants due to poor harvesting methods and overexploitation, coupled with other factors such as human population increase and development pressures which drive land-use change and climate change. This calls for increased coordinated integrative conservation efforts of medicinal plants premised on both ex-situ and in-situ conservation stratagems.

In Uganda, the current conservation approach of medicinal plants in protected areas (in-situ) and general botanic gardens (ex-situ) are inadequate, given the numerous challenges faced by nature in the Anthropocene. Therefore, as one of
its major activities, PHARMBIOTRAC is in the process of setting up a Living Gene Bank (Botanical Garden) and seed bank, integrated with an undisturbed zone of Medicinal Plants in the country based on integration of ex-situ and in-situ approaches. This will enhance: conservation of plant species and associated traditional heritage; teaching that will involve educational institutions and local communities, scientific research by students, local and international partners; production of marketable plant-based products, sustainable use; tourism and recreational activities; and services for improvement of human well-being in the country and in the region.

The PHARMBIOTRAC Living Gene Bank comprises 17.85 Hectares; equivalent to 44.11 Acres, and includes an undisturbed zone (part of National Environmental Management Authority [NEMA] Buffer Zone).

The area to be populated with medicinal plant species has been fenced and partitioned into eight plots to represent the major political regions of Uganda that include West Nile, Northern, Eastern, Central and Western regions; an international zone; a study plot for cultivation experiments and a natural plot for monitoring purposes. One temporary nursery bed has been established and already contains plant collections from the major political zones; permanent ones will be established in due course. Populating the garden will be a continuous process and this will be through conducting botanical expeditions and exchanges of germplasm with other botanical gardens, and procurement of planting materials. A general soil sampling and analysis was carried out to inform decision making in locating various medicinal plant species in the garden. The undisturbed zone (NEMA Buffer Zone) that is sandwiched between River Rwizi and the garden will be important for activities such nature walks in addition to serving as in situ conservation for medicinal plants and related activities mentioned earlier.

A living Gene Bank of Medicinal Plants will greatly contribute to plant science, conservation, and inspire the public to appreciate the vital role of plants to life on earth. Through our efforts, our plant collection will also play a critical role in the health, well-being and cultures of Ugandan and African communities.

By Dr. Eunice A. Olet, the in-charge of the Gene Bank project at MUST.

https://pharmbiotrac.must.ac.ug/
Coming to Uganda in 2019, it was the first time to leave my home country of Ethiopia. It was not easy. Thanks to the Almighty God I am now a graduate clinical pharmacist. I have graduated with a Masters of Pharmacy in Clinical Pharmacy of Mbarara University of Science and Technology (MUST), Uganda. There are huge differences between my early days at MUST and now as a graduate, in lifestyle, in academic knowledge and in my dreams. I have always wanted to study in an environment where I could collaborate theoretical knowledge with practical foundations in my academic field. This program was the right fit.

My studies were possible because of the support of the World Bank and the Inter University Council for East Africa (IUCEA). For my thesis, I conducted clinical research among hospitalized heart failure patients assessing the prevalence and incidence of adverse drug reactions. This gave me a very good opportunity to interact with my patients and impact their quality of life. Despite the grueling schedule at pharmacy school, living away from home and the unexpected worldwide pandemic, my years as a Masters student were some of the best time of my life filled with new experiences. Now as a graduate clinical pharmacist, I believe it is time to prove my worth in the health care system and put a fingerprint in my country and the region.

Finally, I hope other females in my country and the region, many of whom don’t get an opportunity to reach their full potential, can be inspired to go after their dreams.

You can read Efrata’s recently published paper here ▼

https://rdec.be/c0koG

Efrata Ashuro Shegena
Clinical Pharmacist
ACE-DS to establish Data-Driven Incubation Hub

The African Centre of Excellence in Data Science (ACE-DS) is set to establish a Data-Driven Incubation Hub to bridge the gap in academia-industry collaboration specifically in data-driven research.

The Hub will builds on the successful profiles of the Center of Excellence in Data Science and Internet of Things, other schools in science and engineering at the University of Rwanda as well as existing industry-academia collaborations.

The establishment of the Hub is motivated by the fact that big data analytics has become a trend in research as decision makers need data on which to base their decisions.

“This hub will be under the African Centre of Excellence in Data Science and it is elaborated in the vision of the country and university, to be a globally attractive knowledge community with applied information technology and innovation for sustainable growth,” noted Prof. Charles Ruranga, the Centre Director.

The hub will serve as a centre for development of data-driven research with industrial impact and business value, and a nationally leading and internationally recognized data-driven research environment.

This will be a hub for capacity building (people and competence) at the university within the areas of primarily big data analytics, data mining, machine learning, decision support systems, and data collection systems and creation of a tangible academia-industry collaboration, among others.

http://www.aceds.ur.ac.rw/
On October 3, 2022 the Vice Chancellor, Prof. Isaac Sanga Kosgey, officiated the ground breaking ceremony for the construction of the Africa Centre of Excellence in Phytochemicals, Textile and Renewable Energy (ACEII PTRE) office block at Moi University main campus.

ACEII PTRE breaks ground for state-of-the-art office block

The building, constructed by the government of Kenya with financing from the World Bank aims to enhance staff, student and guest experiences.

“I thank the ACEII PTRE team for expanding the infrastructure of our University and thank the World Bank for financing the project and this building,” said Prof. Kosgey.

The Vice-Chancellor also congratulated the architect and the contractors for winning the tender. He called for compliance with the agreement which constitutes the completion of the works within the stipulated time frame.
The Africa Center of Excellence in Phytochemicals, Textile and Renewable Energy (ACE II PTRE), Moi University, Kenya has received support on capacity building for commercialization of edible bio-composite for preservation of fruits and flowers.

The capacity building was provided by a consultant company Chitose. The bio preservative can make mangoes less susceptible to rotting and prolong fruit’s shelf-life. Additionally, the bio-preserve is an eco-friendly product which is safe for the environment and for human consumption. The product prolongs the fruit’s shelf-life between a span of 1-3 weeks, depending on the weather and the climatic conditions of the region.

The Chitose company supported ACE II PTRE to develop a pitch deck and a business model canvas as steps towards commercialization. The product has been evaluated in the field jointly with the farmers, toxicity tests done and currently ACE II PTRE has applied for a patent through the African Regional Intellectual Property Organisation (ARIPO).

Through the Policy and Human Resources Development Trust Fund by the Japanese Government, two pilot activities for commercialization of research have been funded to facilitate university-industry partnerships and develop an institutional capacity on innovation for African universities including ACEs.

Through the university-industry partnership pilot, Moi University and the Nelson Mandela African Institution of Science and Technology were selected from the ACE II Project to receive in-depth technical assistance with Japanese companies on technology transfer and product development.

CHITOSE is a group of biotechnology startups experienced in commercializing research and biotechnology business development.
The ACE II PTRE is currently undertaking a university-industry collaboration pilot with SPEC company from Japan.

The aim of this pilot is to conduct a technology adaptation for STEIN material in Kenya. STEIN is an inorganic soil-hardening agent that is used for hardening soil into strong and solid mass for use in construction industry.

The ACE II PTRE and SPEC want to use STEIN in the improvement of rural earth roads, lining of water conveyance structures, making precast building blocks and interlocking blocks for construction of affordable housing, making precast paving slabs for walkways and car parking areas.

STEIN will be used in stabilizing soils for mud houses construction particularly in areas where the soils are prone to cracking and falling off from the house. So far, ACE II PTRE has collected and tested different soil types from different places in Kenya and carried out comprehensive strength tests in the lab which gave acceptable strength results for the intended use.

Also, ACE II PTRE and SPEC have started the identification and engagement with different organizations on potential collaboration in producing, mixing, packaging or distribution of STEIN material.
PTRE Centre Leader feted with award of Les Palmes Académiques

The Centre Leader Africa Centre of Excellence in Phytochemicals, Textile and Renewable Energy, Prof. Ambrose Kiprop, was on June 17, 2022 feted with the award of Les Palmes Académiques by H. E. Mrs. Aline Kuster-Menager, the Ambassador of France to Kenya and Somalia.

Les Palmes Académiques is the rank and title of the Order of Knight, one of the oldest national honours of the French Republic to scholars. It is the oldest non-military French decoration and is also bestowed on foreigners who contribute to strengthening French education or supporting collaboration with French academia.

Prof Kiprop is the former Dean of the School of Science and Aerospace Studies at Moi University, which is the major proponent for collaboration between France and Kenya. He is currently Moi University’s Acting Deputy Vice Chancellor in charge of Administration, Planning and Strategy.

In 2005, Prof. Kiprop won a scholarship to pursue a doctorate in Geosciences at the University of Nancy (now University of Lorraine), financed by the French government. He also helped form and was the first president of AFRAKEN. Through his networks, the Pamoja Initiative was established to support scientific collaboration between France and Kenya.

Prof. Kiprop thanked the French government for the award, saying it would help motivate scholars to contribute to academic research. He said through partnerships with French institutions, the Faculty of Biological Sciences got financial assistance in 2015. “I understand the power of networking. I have continued to link Kenyan researchers who studied in France. I will continue working closely with the French embassy,” he said.

With the award he is now officially referred to as Sir. Prof. Ambrose Kiprop.

The award is an honour bestowed by the government of France on distinguished academics and teachers and for valuable service to universities, education and science. Prof. Kiprop was lauded for being a founder member of the Association of France Alumni in Kenya (AFRAKEN) in 2010 and having spearheaded the establishment of the collaboration between the University of Lorraine in France and Moi University, Kenya.

AFRAKEN is a society that seeks to strengthen ties between its alumni both in Kenya and abroad.

“With this award, France wants to recognise your outstanding contribution to the immense relations between France and Kenya in university education and research. Today, over 40 projects are ongoing and we owe it to you for the ongoing linkages,” said the Ambassador.
ACEITLMS conducts community outreach activities in Primary and Secondary schools

Master’s students from the African Centre of Excellence for Innovative Teaching and Learning Mathematics and Science (ACEITLMS) together with University of Rwanda College of Education undergraduate students conducted outreach programs in primary and secondary schools to equip science teachers with skills in the use of practical-based lessons in Mathematics and Science education.

The outreach took place in different primary and secondary schools in the Eastern Province of Rwanda and in the City, Kigali. The main objective of the outreach activities is to promote the use of practical based lessons in teaching and learning mathematics and science in lower secondary schools. The centre distributed lab-kit manuals developed in conjunction with Women Supporting Women in the Sciences (WS2). The centre also organizes tailored training for primary school teachers who did not undergo training in Teacher Training Centres (TTC).

During the outreach, Masters students demonstrated practical-based lessons approach and held a question and answer session with the teachers. Dr. Marcellin Rutegwa, the Head of Research at ACEITLMS said the Center adopted this outreach approach to spread innovative teaching and learning of mathematics and science to schools in Rwanda and in countries from where Masters and PhD students collect data. The outreach activity also aims to improve the attitude of students towards STEM. With outreach, the learning environment of the regular classroom is extended with new elements via the unique collaboration with the industry and higher education.

This activity was supported by WS2 that provided lab manual kits and the funds to purchase materials. WS2 is an international initiative unifying and supporting graduate and professional level women and allies in science, technology, engineering, and mathematics (STEM), while providing outreach to elementary and secondary level students.

http://aceitlms.ur.ac.rw/
ACALISE Starts a Radio Station

The African Centre of Excellence in Agroecology and Livelihood Systems (ACALISE) at Uganda Martyrs University has set up a radio station at Nkozi University Campus.

The station’s infrastructure is complete including the mast and accompanying accessories plus the studios and the required equipment. Once operational, the radio will facilitate students learning and sensitization of communities on issues of sustainable development.

The radio will go a long way to promote dissemination of research and best practices especially in sustainable methods of Agriculture which is very important to the ACALISE project.

https://acalise.umu.ac.ug/
The Inter-University Council for East Africa (IUCEA) and the World Bank have signed a grant agreement totaling US$10 million as additional financing (AF) to the Eastern and Southern Africa Higher Education Centers of Excellence project (ACE II).

The grant is part of US$70 million approved by the World Bank Board of Directors on June 21, 2022 as additional financing to the Republic of Malawi and the Republic of Mozambique. The ACE II AF will finance agriculture Africa Centers of Excellence in Malawi and Mozambique to strengthen agriculture higher education and research in the region. The ACE II AF is proposed to scale-up the successful Africa Centers of Excellence (ACE) model to further build the region’s capacity in providing high quality training and applied research in the field of agriculture. ACE II AF will strengthen six competitively selected Centers of Excellence, five (5) in Malawi and one (1) in Mozambique with both countries receiving US$30 million each.

The main objective of the ACE II AF is to strengthen linkages between universities in the participating countries and regional agricultural sector needs through strengthening: (i) agri-food related education and training enhanced with trans-disciplinary approaches and applied research; (ii) university linkages to the regional agricultural sector - its priorities, needs and stakeholders; and (iii) university partnership with private and public entities related to agri-food both within and outside the region.

The ACE II AF will focus on the agriculture sector given the high demand from participating countries for further need to build technical capacity in key thematic areas. It aims to build a strong foundation for generating skills, knowledge, practices and enterprises which, in the longer term, can contribute to increased agriculture productivity and food security across the continent.

Six key regional gap areas have been identified and prioritized for this project:

(i) agribusiness and entrepreneurship;
(ii) agri-food systems and nutrition;
(iii) agricultural policy analysis;
(iv) agricultural risk management and climate change;
(v) rural innovations and agricultural extension; and
(vi) statistical analysis, forecast and data management.

These themes were selected based on extensive consultations with stakeholders including policymakers, academicians, civil society and the private sector. These themes also respond to the climate and disaster risk of Malawi and Mozambique.

The parent project, ACE II, due to close on December 31, 2023 supports the governments of eight participating countries – Ethiopia, Kenya, Malawi, Mozambique, Rwanda, Tanzania, Uganda and Zambia to deliver quality post-graduate education and build collaborative research capacity in five regional priority areas namely – industry, agriculture, health, education and applied statistics. Each of the 24 competitively selected Centers of Excellence is addressing a specific challenge in one of the five priority areas in the region. The ACE II Project’s higher-level objective is to meet the labour market demands for skills within specific areas where there are skill shortages. Since 2016, ACE II has made significant contributions to building the region’s capacity in those priority economic sectors.

As the Regional Facilitation Unit, the IUCEA has built adequate systems through the implementation of the parent project over the last six years to effectively support implementation, monitor performance and verify results. IUCEA will continue to oversee the administration, coordination, monitoring and evaluation, verification of results, communication and visibility of both the ACE II and the new ACEs under ACE II AF. IUCEA will support all the ACEs to ensure fiduciary and safeguards compliance, training of Project Implementation Teams on operational matters and coordination of technical support to the ACEs.

IUCEA is an institution of the East African Community (EAC) responsible for higher education and research. We take this opportunity to thank the World Bank and congratulate the governments of the Republic of Malawi and Mozambique for committing US$60m to finance agriculture higher education. The project will expand the pool of higher skilled workers in agriculture fields and build human resource capacity to undertake applied research which is needed to increase agriculture productivity and food security for the continent.

The closing date for ACE AF is December 31st, 2025.
The Makerere University Regional Centre for Crop Improvement (MaRCCI) is leading the charge in developing agricultural professionals with the skills to appropriately respond to market needs

**BY AGNES NANTAMBI**

Makerere University Regional Centre for Crop Improvement (MaRCCI) has been credited for a training programme that is responsive to the demands of the labour market. Makerere University Vice Chancellor Prof. Barnabas Nawangwe has applauded the Government and the World Bank for entrusting the university with the mandate to train scholars in research and innovation in order to address issues of food security in the country by establishing MaRCCI.

According to the former principal, College of Agricultural and Environmental Sciences, Prof. Bernard Bashasha, MaRCCI has added great value to the college, which has elevated its graduate training capabilities of the University.

MaRCCI Director Dr. Richard Edema (pictured), says: “In order for Africa to keep up with the escalating developments, training institutions, like universities, need to review the kind of curriculum they use to suit the changes in the world. The kind of tools being used are getting modernised and science, which is the driver of economic growth, is also getting sophisticated. We reviewed the curriculum to make it appropriate and responsive to the labour market,” Edema says.

The programmes that have been revamped and now re-accredited by National Council of Higher Education (NCHE) included a master’s in plant breeding and seed systems and PhD in plant breeding and biotechnology. The university launched these two programmes in 2008 to be done by coursework and research. “We thought it was a better way to ground a student well in the discipline of crop improvement. Under these programmes, we decided to give students excellent theoretical and hands-on background,” Dr. Edema says.

After 15 years of implementation, the university recently evaluated the programme to assess how the scholars were performing in the field. This, Edema says, attracted more support for the university. Edema says due to the uniqueness of the training programme, several international
students have been attracted to it. The latest support is through a programme known as Partnership for Skills in Applied Sciences (PASET).

According to Edema, this is aimed at strengthening skills in applied sciences, engineering and technology to further socio-economic transformation in Sub-Saharan Africa.

The program has benefited from support of the following key funders: GOU, AGRA, RUFORUM, Intra Africa EU, DAAD, Seed Systems Group, RSIF among others.

The Regional Scholarship and Innovation Fund (RSIF) is the flagship programme of PASET and focuses on transformative technologies that have a far-reaching positive impact on society.

It is funded by contributions from African governments, the World Bank, the Government of Korea and facilitated by the International Centre of Insect Physiology and Ecology (ICIPE).

Edema says biotechnology is one of the tools that Government of Uganda has identified under NDP III for modernisation of agriculture. But we had very few Ugandan experts trained in this discipline.

“Actually, we used to go and train in these disciplines abroad. I trained abroad, but now we have the capacity to train high-level scholars who are internationally recognised,” he says.

The new training programme targets preparing scholars to enhance agricultural productivity to match the times.

Edema says in the past the breeding process could take them up to 20 years to produce a single variety. “With the new skills acquired, the time spent on producing new varieties has been shortened,” Edema says.

We have developed the capacity to identify plant varieties that perform well and hence our crop improvement programmes can respond to market preferences.

MaRCCI was established with funding from the World Bank, with the overall goal of addressing food security challenges, not only in Uganda, but also throughout the region of central, eastern and southern Africa. It focuses on three elements:

1. Excellence in educating plant breeders and seed scientists who are well equipped to develop and disseminate crop varieties that have improved resistance to disease and insects and better tolerance for dry periods.

2. Research to support such training and contribute to improved crop varieties for all regions of Uganda and her neighbours.

3. Services to strengthen the nation’s agricultural industry, including scientists, technicians, extension personnel, seed producers and farmers.

MaRCCI trains students not only from Uganda, but also from countries across Africa.

Since 2008, the centre has trained 265 students in plant breeding, seed systems, and biotechnology. In countries like Rwanda, Edema says, such expertise had been lacking until recently.

Makerere University, he says, has since been declared an Africa Host Centre.

“Many of the researchers in Rwanda were sent to us for training and have returned home and are working to make the country food secure. The same can be said of South Sudan from where more than 10 researchers were sent here for training,” he says.

He adds: “The governments of Eritrea and Somalia have also asked us to train their researchers. These new scientists will be leading efforts in their home countries in the production of high-yielding and...”

Evelyne Rono, a MSc student from Kenya at work in the MaRCCI biotechnology laboratory

IN NUMBERS

265 Nationals of 21 African countries enrolled in plant breeding, seed systems, biotechnology at Makerere since 2008

2 varieties commercialised; 10 due for release to farmers

4 Research programmes established for sorghum, cowpea, horticulture and orphan crops, seed science and technology

About the centre

Some of the products from sorghum and cowpeas

Evelyne Rono, a MSc student from Kenya at work in the MaRCCI biotechnology laboratory
nutritious varieties that are suitable for the agro-industry and meet the farmer and consumer preferences.

“Most African countries have agro-based economies because of our comparative advantage in agriculture. “So, we need to produce researchers who know how to conduct plant breeding and to produce new varieties,” he says.

He explains that Uganda and Africa at large require new varieties because of the increasing population amidst climate change-induced conditions like drought, floods and pests. “We need to make our land more productive so that we are able to harvest much more food per unit area, to feed our population and the rest of the world,” he says.

He says the centre started a research programme on traditional crops like sorghum and cowpea, a vegetable locally known as ggobe. “We thought these crops were neglected in terms of research and yet when we do a lot of research on them, they can be used to drive the agro-industry as raw materials to make products,” he says.

Apart from sorghum being consumed as kalo, it can be used for making products like enturire (local brew), beer, feeds for animals, sugar and in bakery. Meanwhile, cowpeas which are very nutritious, can be a source of protein in areas where malnutrition is rife. Edema says they were asked to add horticultural crops like tomatoes, onions and pepper to their research programme. “Our horticulture industry is still under-developed, and so we have considered adding two horticulture crops, in addition to cowpeas and sorghum,” he says.

“This is a sign of confidence in the work we have done, especially ensuring that the training is responsive to requirements of labour force need to develop for agriculture for Africa. Our efforts have been recognised by our being declared an African Host Centre or university for training future scientists in plant breeding and biotechnology. MaRCCI happens to be one of four centres that were selected on merit out of 24 others,” he says. According to Edema their goal is to build capacity in science and technology, engineering and mathematics. “We are responding to the President’s call to build scientific capacity because that is where innovations come from. We have built the capacity to handle over 10 PhDs and 35 MScs annually. In addition to expanding classrooms, with the available infrastructure, a lot of crops will be preserved in the cold room at the centre’s genebank, especially those facing extinction,” Edema says.
ACE-ESD trains female engineers from Rwanda Energy Group

The African Centre of Excellence in Energy for Sustainable Development conducted a capacity building training to 25 women engineers, technicians and operators from the Rwanda Energy Group (REG) to equip them with the required skills to perform better in their current areas of work.

During the 10 days training, newly hired female engineers, technicians & operators acquired practical skills and enhanced their knowledge in energy. The trainees conducted practical experiments in ACEESD’s e-tech smartgrid laboratory facility.

Ms. Josephine Uwamahoro, who spoke on behalf of the REG management reiterated REG’s commitment to ensuring women are brought on board in the energy sector at all levels. “We want to see women in REG fully empowered to occupy all positions be technical or managerial ones,” she said.

The energy sector in Rwanda is male dominated. Currently only 22% of REG staff are female.

Through REG, the government of Rwanda has committed to creating the world’s first all female workforce power plant at the new Nyabarongo facility outside of Kigali. The plant construction has commenced with anticipated commissioning in 2024. In the meantime REG has to identify, train, and empower an all-female workforce across all ranks.

http://aceesd.ur.ac.rw/
ACE II Enhances Student Mobility in the region

Studying abroad develops a students social and intercultural skills and improves their employability. The ACE II project provided incentives to encourage ACEs to make it possible for regional students to study in an ACE institution outside their native country.

Hence, as of October 2022 a total of 2,443 regional students had enrolled at ACE hosting institutions outside their country since 2017. Uganda has hosted the highest number of regional students, followed by Kenya and Ethiopia.

ACE II student enrolment at a glance

Number of national and regional students cumulatively enrolled by ACEs (2016/17 - October 2022)

<table>
<thead>
<tr>
<th></th>
<th>TOTAL</th>
<th>ETHIOPIA</th>
<th>KENYA</th>
<th>MALAWI</th>
<th>MOZAMBIQUE</th>
<th>RWANDA</th>
<th>TANZANIA</th>
<th>UGANDA</th>
<th>ZAMBIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) TOTAL national students ACEs enrolled.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>11,547</td>
<td>1,830</td>
<td>1,401</td>
<td>2,046</td>
<td>655</td>
<td>2,775</td>
<td>1,206</td>
<td>1,883</td>
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<tr>
<td>MSc</td>
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<td>415</td>
<td>360</td>
<td>508</td>
<td>568</td>
<td>560</td>
<td>526</td>
<td>708</td>
<td>725</td>
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<tr>
<td>PhD</td>
<td>987</td>
<td>177</td>
<td>136</td>
<td>38</td>
<td>0</td>
<td>101</td>
<td>255</td>
<td>152</td>
<td>128</td>
</tr>
<tr>
<td>SC</td>
<td>7,396</td>
<td>1,238</td>
<td>905</td>
<td>1,500</td>
<td>87</td>
<td>2,114</td>
<td>425</td>
<td>1,023</td>
<td>104</td>
</tr>
<tr>
<td>b) TOTAL regional students ACEs enrolled.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>2,443</td>
<td>469</td>
<td>469</td>
<td>324</td>
<td>23</td>
<td>436</td>
<td>405</td>
<td>572</td>
<td>150</td>
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<tr>
<td>MSc</td>
<td>942</td>
<td>177</td>
<td>135</td>
<td>42</td>
<td>23</td>
<td>138</td>
<td>129</td>
<td>196</td>
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<tr>
<td>PhD</td>
<td>408</td>
<td>44</td>
<td>47</td>
<td>33</td>
<td>0</td>
<td>83</td>
<td>82</td>
<td>77</td>
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<tr>
<td>SC</td>
<td>1,498</td>
<td>248</td>
<td>287</td>
<td>249</td>
<td>0</td>
<td>215</td>
<td>194</td>
<td>299</td>
<td>6</td>
</tr>
</tbody>
</table>

By end of October 2022, ACEs had cumulatively enrolled:
- A total of 11,547 national students, majority on short courses (7,396) followed by 4,370 on Masters and 987 on PhD.
- A total of 2,443 regional students, most of them on short courses (1,458) and Masters (942).
Graduate Tracer
Tracing Wise Futures graduates at Nelson Mandela African Institution of Science and Technology – NMAIST

Ms. Upendo Shushu from Tanzania graduated with a master’s in Hydrology and Water Resources Engineering. Her research was about optimization of unplanned water distribution network in fast-growing towns: A case study of Mwanza City. Before joining WISE-Futures, she was working at Arusha Urban Water Supply and Sanitation Authority (AUWSA) as Project Water Engineer. After earning her master’s degree Ms. Upendo was promoted to Acting Director of Water Supply and Sanitation Management. She is currently responsible for water production, transportation, treatment and distribution and sanitation services including waste water transportation, treatment and discharge, faecal sludge management/treatment and supervision of projects undertaken by AUWSA in Arusha City and other towns in the region.

Ms. Lucia Petro from Tanzania graduated with a master’s in Sustainable Energy Science and Engineering. Her research was about optimization of domestic biogas stove efficient energy utilization. Before joining WISE-Futures she was an instructor at Arusha Technical College, a vocational training with a university status in Arusha. After completion of her MSc studies Ms. Petro was promoted to Assistant Lecturer in the Department of Mechanical Engineering in the same institution. She now teaches engineering courses. As a female trainer she says she is inspiring young women to pursue courses in science and engineering.

Rosemary Kavishe from Tanzania graduated with a master’s in Hydrology and Water Resources Engineering. Her research assessed the Adoption and Water productivity of the system of Rice Intensification under Farmer-Led Irrigation System in Northern Tanzania. Before WISE Futures she was working at Mbeya University of Science and Technology as a Tutorial Assistant. Upon completion of her master’s program
Ms. Rosemary was promoted to Assistant Lecturer and is the Head of department of Architecture and Art Design. She recently started her PhD studies at the University of Dar es Salaam where she is studying Water Resource Engineering.

Dr. Aloyce Isaya Amasi from Tanzania graduated with a PhD in Environmental Sciences and Engineering. His study investigated the Sediment source and delivery dynamics in an East African Hydropower reservoir using sediments tracing technology. Before joining WISE-Futures Aloyce was a Nuclear Research Officer at the Tanzania Atomic Energy Commission. Aloyce currently works as a lecturer at NM-AIST in the School of Environmental Science and Engineering where he teaches and supervises PhD and MSc students.

Ms. Latifa Omary from Tanzania graduated with a master’s in Environmental Sciences and Engineering. Latifa researched the Impact of Climate Change on Ground Water in Lake Manyara Catchment. Before WISE-Futures Latifa was employed at the Tanzania Meteorological Authority as a Technician. After earning her master’s degree, Ms Latifa moved to the Petroleum Upstream Regulatory Authority where she works as the Environmental Management Officer. Her current duties include inspection of safety and environmental compliance in upstream petroleum operations.

Jean Gildas Tapsoba from Burkina Faso graduated with a master’s in Hydrology and Water Resources Engineering. Jean researched the Production of Biogas as a Waste Management Option for Textile Effluent Sludge: A case study of the A to Z Textile Mills LTD. After his studies Jean returned to Burkina Faso and worked with different NGOs including as a WASH Program Assistant for the Danish Refugee Council in the Sahel Region for Internally Displaced Persons. Jean is currently at the IHE Delft Institute for Water Education in the Netherlands doing a second masters degree in Water Management and Governance.

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Ms. Tumuramye Kellet from Uganda studied Msc. in Agroecology from 2016 – 2018. She works with Coetzee Organics Uganda Limited as a Quality Assurance and Certification officer. She says, “The Msc. in Agroecology empowered me with knowledge and skills in organic inspection and certification which has enabled me find a competitive job.”

Mr. Mugagga Nelson from Uganda studied Msc in Agroecology from 2018 – 2021. He works in agrotech insurance as a certification executive. He says, “I am competent at assessing agricultural businesses/farms and proposing appropriate insurance covers. This has also enabled me to expand my networks in the agricultural sector.”

Mr. Issa Balde from Senegal studied Msc in Agroecology from 2018 - 2020. He works in Dakar as an Agroecology Officer and Advisor. He says, “My research on determining optimum application rate of vermicompost for cabbages and sukuma wiki production was funded by ACALISE. I am very resourceful at my current role with the knowledge and networks I built during the programme.”
The African Centre of Excellence in Sustainable Agriculture and Agribusiness Management (CESAAM) has played a key role in increasing enrolment of postgraduate students between 2017-2022. A recent study done at the university revealed that 66% of the students indicated that a scholarship could have influenced their decision for enrollment. A quarter of the respondents stated that an award of $3,000 could have prompted them to join their postgraduate studies.

CESAAM, hosted at Egerton University has to date supported 240 postgraduate students in the department of Agricultural Economics and Agribusiness Management. The centre hosts students from the whole region with 23% being regional and 52% female. A total of 63 students have so far graduated (10 PhDs and 53 MScs) and 31 will graduate by December 2022. These graduates are in the areas of agri-innovations, agri-entrepreneurship, Climate Smart Agriculture, research, training, and technology transfer for sustainable development.

CESAAM’s mission is to provide highly trained human resource and agri-innovative products, services, and sustainable solutions that address the challenge of food insecurity and persistent hunger in Africa.

Ms Martha Kuria graduated with a Msc Food Science in December 2021
1. **Background**

The Inter-University Council for East Africa (IUCEA) is organising the Academia-Public-Private Partnership Forum (APPPF) and Exhibitions in partnership with the East African Business Council (EABC). The APPPF will be held on 15th – 17th March 2023 at the Julius Nyerere International Convention Center, Dar es Salaam, Tanzania under the theme “Nurturing Sustainable Skills Development for Youth Employability Through Academia-Industry Partnerships.” Running parallel with the Forum will be exhibitions to enable innovators, researchers, academia, and the public and the private sectors to display the practical aspects of their operations, products, services and achievements as a way of enhancing linkages between the academia, the public and the private sectors in promoting industrialization in the region.

2. **Call for Exhibitions**

Entrepreneurs, innovators, higher education institutions, public and private sector organizations are hereby invited to participate in the exhibition. Participation in the exhibition will be an excellent opportunity to showcase institutional profiles, services, and products to various stakeholders. The exhibition will also provide an opportunity for the exhibitors to interact with the best and most ambitious talents in the private sector and academia, for the eventual productive engagement between these complimentary systems.

3. **Expected Participants in the Exhibitions**

a) Delegated to the Forum, namely: - The private sector fraternity in East Africa and beyond – business leaders and employers (manufacturers, bankers, transporters, telecommunication providers, venture capitalists); SMEs; entrepreneurs, etc.
b) The academic and research fraternity in East Africa and beyond – education managers and administrators, including vice-chancellors, rectors, principals, provosts, registrars, deans, directors, and professors from higher education/research institutions across East Africa
c) Policy makers and government officials in East Africa
d) Development Partners
e) The media
f) Students
g) General public

4. **Provisions to Exhibitors**

a) 3 m x 3 m exhibition booth.
b) Exhibition furniture, including one table and two chairs
c) One-page profile in the official forum catalogue (provided by exhibitor)
d) Visit by more than 500 people including Forum participants and the general public
e) Media coverage

To book your exhibition stall or space in the forum catalogue please contact apppforum@iucea.org

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