



MAKERERE UNIVERSITY

CAES NEWSLETTER

OCT - DEC 2021



**MAK MANAGEMENT HONOURS
PROF. BERNARD BASHAASHA**



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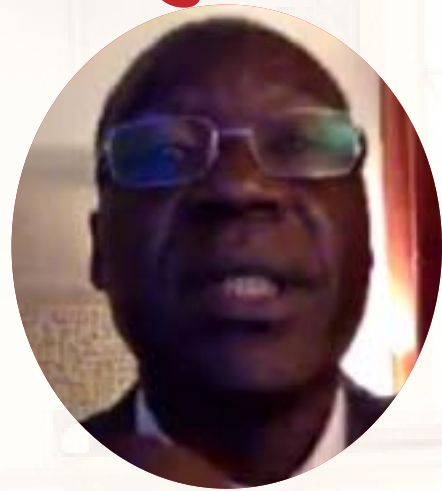
Appreciation to Outgoing Principal, Prof. Bernard Bashaasha (August 2013 - January 2022)



Under his leadership as Principal, the College of Agricultural and Environmental Sciences (CAES) has continued to attract a big number of research grants and to position itself as a Centre of Excellence in Research and Innovations in the agricultural sector. At the moment, staff and students of CAES are engaged in over 200 research projects supported by local and international partners. Through these projects, CAES has tremendously contributed to the growth of the agricultural industry, both nationally and regionally. The College has also continued to churn out top notch graduates that are offering academic services to institutions within and outside the country. Our appreciation goes out to Prof. Bernard Bashaasha for his dedication and selfless leadership.



CAES Leadership



Aspirants for the position of Principal CAES, Dr. Gorette N. Nabanoga (L) Prof. Jacob Agea (C), Dr Patrick Okori

The assessment/search process for the positions of Principal and Deputy Principal College of Agricultural and Environmental Sciences (CAES) was overseen by a Special Committee of the University Council led by Mr John Chris Ninsiima. Other members of the Committee included; Rt. Hon. Dan Fred Kidega; Counsel Jude Mbabaali; Dr Fredrick Edward Kitoogo; Dr Helen Nambalirwa Nkabala; and Her Worship Doreen Nyanjura. Aspiring candidates for the position of Principal, CAES are: Dr. Gorette N. Nabanoga, Prof. Jacob Godfrey Agea, and Dr. Patrick Okori. Aspirants for the position of Deputy Principal include; Dr. Denis Mpairwe, Dr. Yazidi Bamutaze and Dr. John B. Lamoris Okullo. During the presentations, all candidates expressed commitment to improve the College infrastructure, research, ICT, and resource mobilization. They also committed to strengthen national, international and inter-university collaborations. The candidates pledged to promote learner centred curriculum; teamwork; equal opportunities, gender equality, equitable resource allocation, strengthen the College grants office, promotion of centres of excellence, peer-to-peer learning between students, and conducive student support services. Other key commitments included; enhancing industry partnerships; and ensuring full implementation of the 2020-2030 Strategic Plan that aims to transform Makerere into a research-led University. Once appointed, the Principal and Deputy Principal will serve a four-year renewable term.



Aspirants for the position of Deputy Principal: Dr Yazidi Bamutaze (L), Dr. Denis Mpairwe (C) and Dr John B. Lamoris Okullo

CONSORMIP Project to Close on A High Note In Spite of COVID -19 Disruptions

The BIOINNOVATE funded CONSORMIP project in full “Commercialization of novel sorghum and millet products for improved socio-economic gains in Eastern Africa” is set to end on a high note. The project was a partnership between Makerere University, Sokoine University of Agriculture in Tanzania and Hawassa University in Ethiopia. The project targeted to address the market gap - lack of value added convenient and nutritious sorghum and millet based products particularly instant porridge flour, puffed snacks, and complimentary porridge flour. To this end, this project commercialized the named products made from sorghum and/or millet. A lean business start-up and business incubation approaches to commercialize the product. This approach is expected to deliver tangible benefits to the target beneficiaries namely small holder farmers, malnourished children and mothers as well as school going children.



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The project developed and supported SMEs in each partner country as a vehicle for commercialization of the developed value added products in the respective countries. The products and spin-off SMEs are set to be launched soon at the end of project meeting to be held at Soikine University of Agriculture in Tanzania. This project was funded by the BIOINNOVATE AFRICA program and run 2018-2020 with Assoc. Professor Yusuf Byaruhanga as PI.



MAK-FTBIC Gets New Manager

In mid-2021, the Food Technology and Business Incubation Center got Assoc. Professor Yusuf Byaruhanga as its new Manager after the retirement of Prof. William Kyamuhangire. Before coming in as a manager Prof. Byaruhanga served as FTBIC Liaison Officer and Coordinator of the Skills Training Program for Small and Medium Enterprises. He brings on board a wealth of skills and experience in technology and business incubation as the center continues to make tremendous contribution to the growth and development of Uganda's food industry.



Prof. Yusuf Byaruhanga

MAK-FTBIC is Uganda's premier technology and business incubation center in the field of food and nutrition. Housed at the School of Food Technology, Nutrition and Bioengineering, Makerere University, the center provides a place, opportunity and an enabling environment where innovations, knowledge and skills are transformed into viable enterprises. MAK-FTBIC targets to serve students, fresh graduates, youths and women with innovative food science and technology ideas that have commercial potential.

MAK-FTBIC offers services including but not limited to: Access to food processing equipment for production, development and piloting; Quality and safety testing facilities; Technical support in research as well as product development and formulation; Production scale up and pilot testing; Production, quality and safety management systems development and support; Enterprise and business systems development; Business concept and model generation; Intellectual property evaluation and management support; Short training courses in food processing and preservation; Technical support to SMEs; and Design and fabrication of agro-processing equipment.

For further information on how to access the FTBIC services contact:

**The Manager , Mak-FTBIC
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Bio-Engineering , Makerere University.**

**P. O. Box 7062 Kampala
Tel: 0414533865 Fax 0414533676
Email: makftbic@mak.ac.ug, makftbic@gmail.com**

NUTRIFOODS Project Progresses In Spite Of Challenges

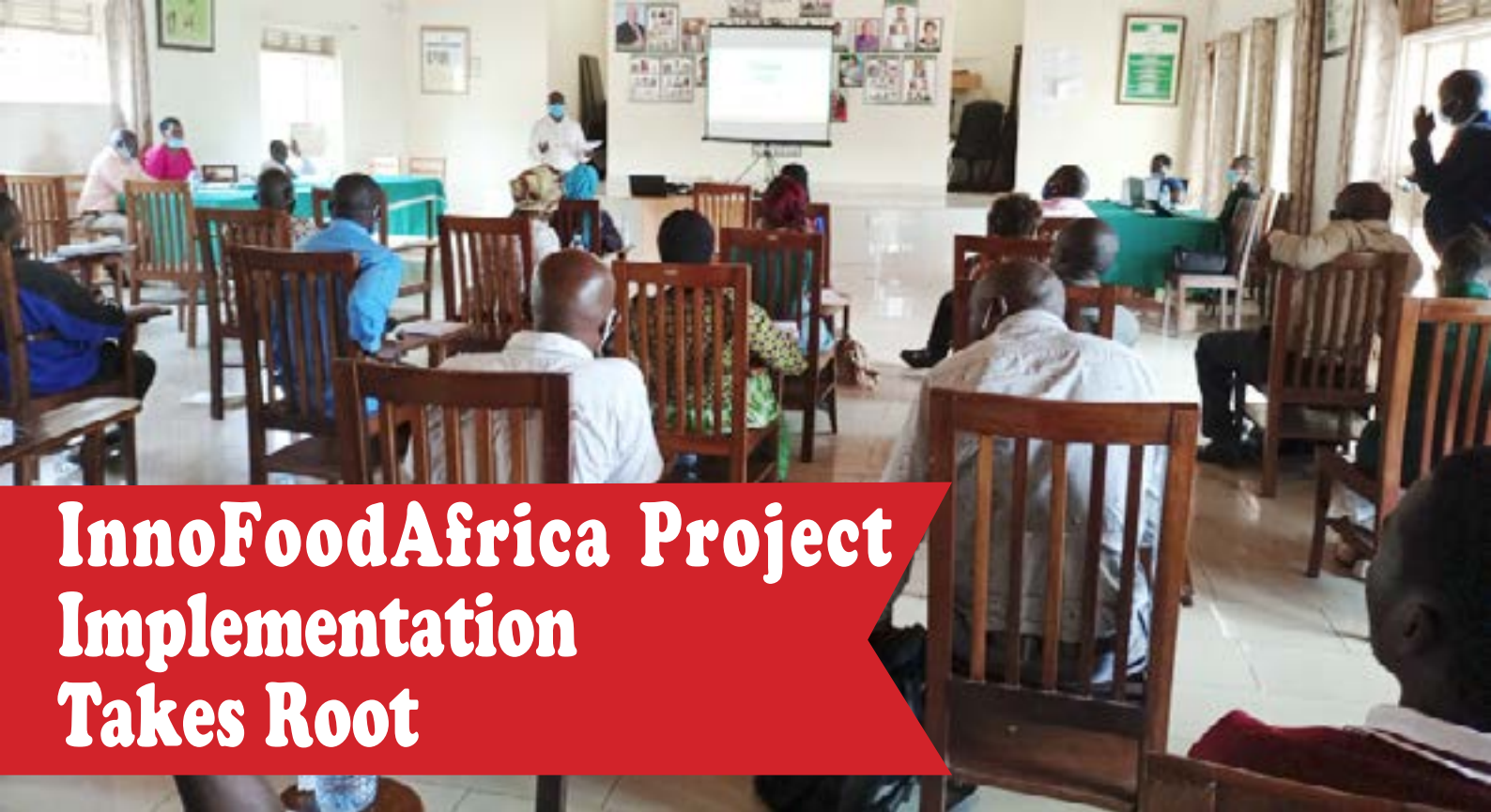
NUTRIFOODS project “Innovative approaches to value-addition and commercialization of climate-smart crops (CSFC) for enhanced food security and nutrition in Africa and beyond” is a cooperation between African and European Universities and private sector. The aim of NUTRIFOODS is to enhance food and nutrition security and improved livelihoods of stakeholders in the climate-smart food crops (CSFC) value chain. This to be achieved through developing and testing improved baking ingredients from climate-smart crops in Africa; commercializing the new ingredients; and improving capacity for training, research and development in CSFCs namely cassava and cowpeas.



The project has completed a consumer survey in which users and consumers of the developed ingredients and their needs were established; screened different cassava varieties in Uganda for processing suitability different industrial applications; developed processing protocol for cassava and cowpeas to impart properties for different industrial applications. The project is also supporting graduate students.

The NUTRIFOODS project is supported by the Government of Uganda and European Union under the LEAP AGRI program. The project partners are Wageningen University – Netherlands, Bake Five BV – Netherlands, Technical Research Center of Finland – Finland, University of Pretoria – South Africa, University of Venda – South University, Bakery Incubation Center (BICSA) – South Africa, Kenya Industrial Research and Development Institute – Kenya, Nutreal Ltd – Uganda and Makerere University, with Assoc. Professor Yusuf Byaruhanga as the PI.





InnoFoodAfrica Project Implementation Takes Root

The InnoFoodAfrica project in full “Locally driven co-development of plant based value chains towards more sustainable African food systems with healthier diets and export potential” is exploring climate-smart African crops (cereal-pulse-root crop-fruit) in Ethiopia, Kenya, South Africa and Uganda. In Uganda the project is focusing on banana, millet, cowpeas, and amaranth. The project is developing develop and will demonstrate optimal solutions for cultivation practices, processing and productization towards new value chains, thus enhancing nutritionally balanced food consumption in Uganda and creating opportunities to reach international markets. The main output is to demonstrate the huge potential of the African crops as healthy ingredients in combating both under and over nutrition. The emphasis is to target vulnerable groups, such as malnourished children, pregnant women and adults under the risk of obesity, by increasing the diversity of affordable, nutrient-dense and healthy food products based on local crops, and educating people for improved eating habits.

The project addresses key bottlenecks of African food value chains - low productivity, limited access to urban markets, affordability and convenience of end products - by tailoring actions on local context to develop novel technologies in agriculture, food processing and use of residual biomass for packaging, and concurrently to investigate food safety, food security and food loss reduction. Trainings, targeting farming and business communities covering farming productivity of indigenous crops, effective post-harvest technologies, valorization of biomass residue materials, nutritional guiding, and entrepreneurial skills. The project will also foster international cooperation with other EU-Africa and inter-African projects (FNSSA).





InnoFoodAfrica Project

This far, the project has implemented several farmer participatory research activities in eastern and central Uganda; developed ingredients with improved functional properties from banana, millet cowpeas and amaranth for use in different food applications; surveyed the agricultural side streams and characterized them and is currently completing a food consumption survey in the project research areas.

The project is supporting several graduate students and is working with the private sector to ensure technology uptake and commercialization. The project partners in Uganda include Makerere University, Kulika Uganda, FONUS Ltd, Uganda Manufacturers Association. At Makerere University the project team is composed of Dr. Geoffrey Tusiime, Dr. Stellah Byakika among others and led by Assoc. Prof. Yusuf Byaruhanga. InnoFoodAfrica project is funded by the European Union under the Horizon 2020 Program and will be running 2020 to 2023.

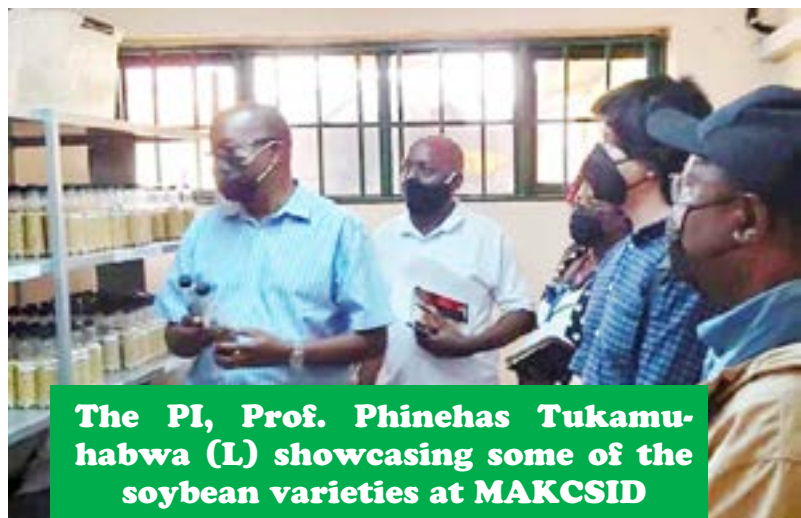


Makerere & Partners to Develop Soybean Value Chain in Uganda

Makerere University College of Agricultural and Environmental Sciences (MakCAES) is working with partners to develop the soybean value chain in Uganda. This was revealed at the Soybean Mission hosted by the Centre for Soybean Improvement and Development (MAKCSID) on the 24th October, 2021 at the Makerere University Agricultural Research Institute, Kabanyolo (MUARIK). The partners involved in the initiative include Ministry of Agriculture Animal Industry and Fisheries (MAAIF), United Nations Development Programme (UNDP), United Nations Food and Agricultural Organization (FAO) and the Government of Russia. The potential of the crop has not been fully utilized in Uganda hence the initiative at hand.

Soybean has been described as a miracle crop with many uses – people can eat them, drink them in milk alternatives, and take them in the form of supplements. Manufacturers may also extract the oil from soybean. The crop contains approximately 40% protein and 20% oil, both of which are vital in human and animal diet. With the available technology for processing soybeans at industrial and household level, soybean has become one of the most promising food crops available to improve the diets of millions of people in the world. Soybean contains at least 100% more proteins with yields of 5-10 times more protein per unit area than any other crop. The protein in soybean is also balanced with all the essential amino acids which the body cannot manufacture.

Likewise, the strategic plan of the MakCAES also highlights partnerships as a means of research and innovations development. He reiterated that Makerere is working to become a research-led University and thus the initiative under discussion here is very consistent with the move towards research. “Support of value chain development, productivity, profitability and improved incomes and livelihoods is major thrust for the College,” he noted. Prof. Bashaasha further explained that most value chains are struggling but Soybean has performed well.



The PI, Prof. Phinehas Tukumuhabwa (L) showcasing some of the soybean varieties at MAKCSID

In his opening remarks, the Principal of MakCAES, Prof. Bernard Bashaasha said the meeting was aligned to the policy framework of the National Development Plan III (NDP III) which emphasizes industrialization, value addition and value chains.



A field of Soybean Varieties under Trial at MAKCSID, MUARIK, Wakiso, Uganda



Some of the soybean varieties from Uganda and Zimbabwe at MAKCSID

In his opening remarks, the Principal of MakCAES, Prof. Bernard Bashaasha said the meeting was aligned to the policy framework of the National Development Plan III (NDP III) which emphasizes industrialization, value addition and value chains. Likewise, the strategic plan of the MakCAES also highlights partnerships as a means of research and innovations development. He reiterated that Makerere is working to become a research-led University and thus the initiative under discussion here is very consistent with the move towards research. “Support of value chain development, productivity, profitability and improved incomes and livelihoods is major thrust for the College,” he noted. Prof. Bashaasha further explained that most value chains are struggling but Soybean has performed well.

Prof. Phinehas Tukamuhabwa, the Principal Investigator for the Soybean Breeding and Seed Systems at MakCAES presented the work that had been accomplished over the years by the Soybean Centre and the work that continues to be done. He pointed out that Makerere University is leading in soybean research in Uganda and the African region. He highlighted the importance of soybean in humans and livestock nutrition, and outlined the soybean varieties bred and developed by Makerere University, namely Maksoy 1N, Maksoy 2N, Maksoy 3N, Maksoy 4N, Maksoy 5N and Maksoy 6N. He pointed out that these soybean support soybean industry in Uganda, where 94% of the Ugandan farmers grow Makerere University varieties. Prof. Tukamuhabwa noted the importance of public-private partnership as well as other partnerships to develop the value-chain of this ‘wonder crop’. “We are excited about the partnership with UNDP, FAO, Russia and MAAIF to take our work on soy-bean forward, especially the efforts of the last five years,” he said.

Representatives from FAO and UNDP expressed their pleasure at working with Makerere University and CAES in particular. “We look forward to working with all the partners on this project”. The meeting participants were taken on a tour of the facilities of the Soybean Centre at MUARIK, after which the team proceeded to visit various sites in Eastern Uganda including farmers and a factory, where the initiative activities will take place. The centre has also established a state-of-the-art seed storage facility for early generation seed (Breeders and Foundation seed) and soybean germplasm used for breeding other varieties. Other facilities are soybean processing equipment (soycow) and Soybean roaster that are used to add value to soybeans.

Innovation - Mak Student designs, “the Push-Pull App” to Guide Farmers Control Maize and Sorghum Pests



Makerere University student Paul Mugisha in collaboration with a team of scientists from ICIPE, Keele University and Leeds University developed a mobile app to help maize and sorghum farmers to control pests without using pesticides. Paul Mugisha is undertaking a Master of Science in Plant breeding and Seed systems at Makerere University's Department of Agricultural Production, School of Agricultural Sciences under the College of Agricultural and Environmental Sciences (CAES). Mugisha is also the Chief Executive Officer (CEO) Agape Innovations Ltd. The purpose of this app is to enable a farmer to do push-pull on his garden without interacting with an extension agent but purely using his mobile phone which does not only solve the problem of scarcity of extension workers, but also, prevents the spread of COVID-19.

The new app code-named, “the Push-Pull App”, was launched and made available for use on google play store on 9th August, 2021 by an international team of scientists to support farmers across Africa to use innovative, environmentally-friendly techniques for evading crop pests. In a press release issued during the launch, scientists noted that African small-holder farmers face major challenges from insect pests such as fall armyworm, and weeds such as striga that can destroy their crops. Fall armyworm is a serious threat to food security and livelihoods and already affects at least 400,000 hectares, causing crop losses worth an estimated \$3 billion a year. In the release, the “Push-Pull technology” was described as a novel method of crop management and a solution which can massively reduce farmers' losses from pests and increase their harvest sizes, whilst avoiding the need to use harmful and expensive chemical pesticides.





Mak Researchers Guide Upland Rice and Maize Farmers on Production, Fertiliser Application

Maize and upland rice are very important to Uganda's agricultural sector. The two crops are grown by many smallholder farmers in the country for both food security and income, especially in Bunyoro region. Over the last two decades, the total production of Maize and rice has gradually increased. For instance in 2014, Food and Agriculture Organization (FAO) reported that the quantity of rice produced in Uganda increased by 26% from 1997 to 2007. Similarly, total maize production in the country increased from roughly 800,000 tons in 2000 to 2,575,000 tons in 2019. This trend in production is explained more by the steady expansion in acreage cultivated than from increased productivity per acre.

Low productivity is an established and well documented challenge facing Uganda's agricultural sector. This is mainly because most soils on which the crops are grown have declined greatly in fertility but also due to low fertilizer usage, pests and diseases and other production constraints. There is also reported evidence of changing climate which further negatively affects maize and rice production.

To address the issue of low yields due to low soil fertility, the government of Uganda through Makerere University Research Innovations Fund (MAK – RIF) funded a project 'Upgrading interim fertilizer recommendations of priority crops for increased agricultural productivity in Uganda'. The project focused mainly on conducting a rapid soil testing and plant tissue analysis study of the two crops in Bunyoro region. To carry out the study, two main soil types in Bunyoro on which maize and upland rice are grown were identified. The soil types included the Ferralsol in Hoima district and a Regosol in Kikuube district. Ferralsol are soils that are generally very old soils (highly weathered) with low cation exchangeable capacity, high kaolinite and high Fe and Al oxides while Regosol are weakly developed mineral soils in unconsolidated materials. These are dominated by stones and the parent material still undergoing weathering. The high stone content is also characteristic of high iron levels.



The soil samples and plant samples were collected from each field of each crop, tested in the soil and plant laboratory at Makerere University. A total of 15 soil and plant composite samples were collected from each soil type under each crop type. Both soil and plant samples were collected and tested in laboratory at Makerere University for pH, SOC, texture, TN, avail. P, extractable K, Ca, Mg, and Fe, Mn, Zn. Computations were also made on potential profitability of both crops when fertilizers are used. Key informants provided information on current maize and rice production processes, and associated costs to support the computations used in the research.

The findings from the study were shared with the stakeholders in a dissemination meeting that was held on the 27th August, 2021 at Buhimba Subcounty Community Hall in Kikuube district. The audience comprised of upland rice farmers, maize farmers and extension staff of Kikuube and Hoima districts. In the meeting, Dr. Patrick Musinguzi, who is the Principal Investigator, informed stakeholders that maize and upland rice needed different fertilizer rates despite having similar soil tests results on each of the soils. The soil results showed that both Ferralsol and Regosol had insufficient amounts of phosphorus, potassium and Zinc but significant level of iron (Fe) contents was observed. The rice and maize samples showed a similar trend of nutrient content with strikingly low levels of zinc. In order to sustain production of maize and upland rice, the study proposed some interim fertilizer application rates that farmers can use. These were computed from the soil tests and plant tissue test that were conducted. [Read more](#)



Key insect pests of collaboration with FABI

Glycaspis brimblecombei



Thaumastocoris peregrinus



Leptocybe invasa



Research workshop: Impact of pathogens on Agricultural production

Agriculture is the backbone of Uganda's economy, employing about 73% of the population and contributing approximately 20% of the country's Gross Domestic Product (GDP) and 48% export earnings. The National Development Plan (NDP III) identifies agriculture as one of the key growth opportunities with the highest potential to generate employment and have positive multiplier effects on other sectors. The Agricultural sector contributes about 50% of the gross domestic product (GDP) of most countries in Africa, and plays a pivotal role in ensuring food security across the globe. The sector is however derailed by a number of factors. Key among these are pathogens that are greatly undermining crop production in the country and Africa in general.

On 8th-9th November 2021, the Department of Agricultural Production, College of Agricultural and Environmental Sciences (CAES), Makerere University in partnership with the University of Pretoria, South Africa held a research dissemination workshop at Golf Course Hotel, Kampala to deliberate on a number of issues affecting the sector.

Dr Nicholas Kagimu



Convened by Dr Nicholas Kagimu under the theme “The Impact of Pathogens on Agricultural Production”, the workshop was part of the activities under the Future Africa’s Early Career Research Leader Fellowship (ECRLF) programme at the University of Pretoria intended build a critical mass of the next generation researchers in Africa. It drew participants from academic and research institutions across Africa.



**Prof. Cheikh Mbow -
Director Future Africa**

Topics discussed included; the Status of nematology research in Uganda by Dr Herbert Talwana (Department of Agricultural Production, CAES); Bioprospecting of the Natural Products from Xenorhabdus and Photorhabdus bacteria and their application in agriculture by Dr Nicholas Kagimu (ECRL Fellow at Future Africa, University of Pretoria); Entomopathogenic fungi for insect crop management by Dr Jeninah Karungi (School of Agricultural Sciences, CAES); An overview of Entomopathogenic nematodes- EPN (insect-killing-worms) in Africa/ICIFE perspective presented by Dr Solveig Haukeland, ICIFE Nairobi); Status of liquid culture development for commercialization of entomopathogens in South Africa (Prof. Antoinette Malan, Stellenbosch University); Forest pest surveillance to protect Africa’s forest resource (Prof. Brett Hurley, FABI – University of Pretoria); Bio-control agents in pest management in Uganda’s forest systems (Dr Peter Kiwuso – NaFORRI); Bio-prospected products from insects (pharmaceutical, nutritional, cosmetics) presented by Dr Alice Nabatanzi, College of Natural Sciences – Makerere University; Chemical defenses of forest trees to fungal infection and the consequences of these defenses on insect herbivory (Prof. Almuth Hammerbacher – FABI, University of Pretoria); What Forestry and Agricultural Biotechnology Institute (FABI), University of Pretoria can offer in collaboration with research and industry in Uganda (Prof. Bernard Slippers – Director FABI, University of Pretoria); Tsetse fly vector: effects distribution and control in Uganda; Tick epidemic and vaccine development; Helminths and helminths control in

small ruminants (Dr Idibu Joachine –CoVAB, Makerere University); Veterinary drug use and resistance; Potential of biopesticides in small holder agricultural systems (Dr Paul Sigombe – Real IPM Uganda); as well as Chemical control of internal and external parasites in livestock by Dr Ivan Kisakya from MTK Uganda. In their discussions, the researchers highlighted the different challenges affecting agriculture across Africa and the extent of the damage caused by pathogens to plants and humanity. Besides other challenges, the researchers noted that pathogens were causing a serious economic threat, calling for various interventions to eliminate them. [Read more](#)



**Dr Herbert
Talwana**





Skilling Roadside Plant Nursery Owners on Business Management and Sustainable Practices

Uganda's roadside urban and peri-urban plant nurseries are a unique small-scale business that play a critical role in poverty eradication by acting as green businesses and providing employment to many youth and women. However, their growth and sustainability is threatened by inadequate requisite business management skills and knowledge. To remedy this, a multi-disciplinary team of researchers from the College of Agricultural and Environmental Sciences (CAES), College of Natural Sciences (CoNAS), and the College of Business Management (CoBAMS), Makerere University have embarked on activities to build business management skills and sustainable plant nursery management practices among their owners, operators, and workers.

The researchers namely; Dr Edward Nector Mwavu (Principal Investigator), Dr Anthony Tibainana, Dr Paul Ssegawa, Dr Grace Nakabonge and Ms. Agatha Syofna are working in collaboration with officials from the Ministry of Local Government and National Agricultural Research Organization (NARO). The activity is intended to enhance profitability of the roadside plant nursery business. Through their project titled "Building business management skills and sustainable practices among urban and peri-urban roadside plant nursery owners, operators and workers for resilient 'green' businesses in Greater Kampala, Uganda, the researchers are training roadside farmers on the best plant and business management practices. The project is supported by the Government of Uganda through the Makerere University Research and Innovations Fund (Mak-RIF). [Read more](#)



More Pork Project Training Mpigi and Wakiso pig farmers on Artificial Insemination



Researchers from the College of Agricultural and Environmental Sciences (CAES), Makerere University in collaboration with Veterinary Officers from Vetline Services, Mukono District trained farmers in Mpigi and Wakiso districts on pig productivity and African Swine fever management. Under their project titled “Improving pig productivity and income through an environmentally sustainable and gender inclusive integrated intervention package”, the researchers led by Dr Donald Kugonza equipped over 300 pig farmers in Buwama, Nkozi, Kyengera, Wakiso, Kakiri, Mende and Kasangati Town Council with skills on Artificial Insemination. The farmers have also been trained on the identification and management of diseases in pigs, vaccination, identification of the best breeds, feeding of pigs, and biosecurity.



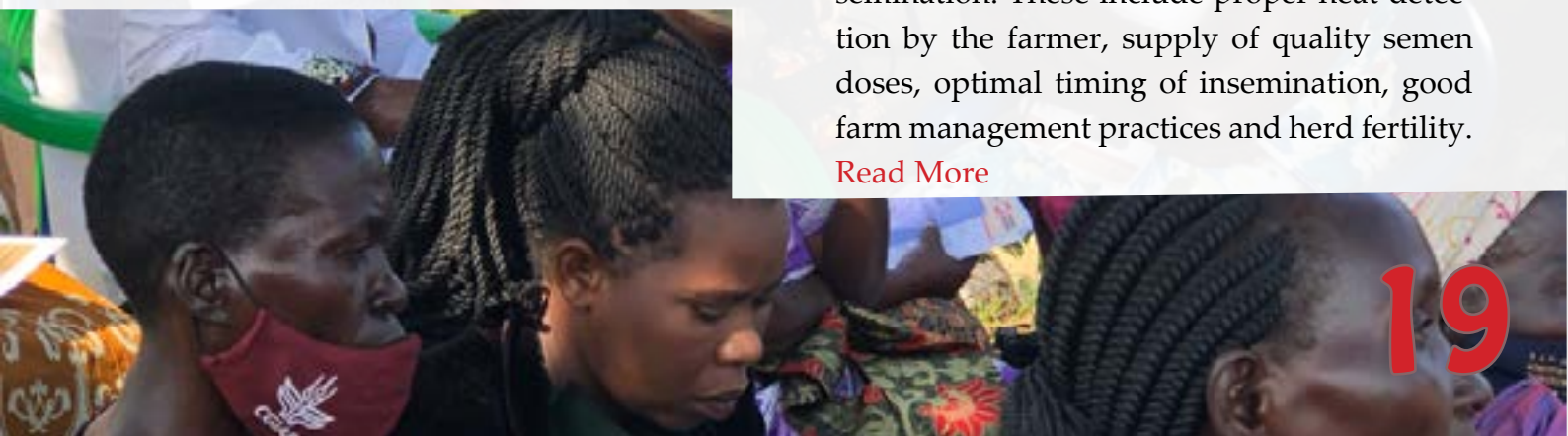


Dr Donald Kugonza

The activity intended to boost pig herd genetics, productivity and marketability of the products is a component of the More Pork Project supported by the International Livestock Research Institute (ILRI). Through the More Pork Project, ILRI works with partners worldwide to enhance the roles that livestock play in food security and poverty alleviation, principally in Africa and Asia. The project is coordinated by Dr Karen Marshall, Principal Scientist at ILRI. It is implemented in four districts in Uganda namely; Mukono, Mpigi, Wakiso and Masaka.

During the five-day activities that started on 22nd November 2021 in Buwama, Mpigi District and ended in Kasangati Town Council, Wakiso District on 26th November 2021, the trainers including Mr Robert Natumanya from CAES, Makerere University, Dr Leonard Kawule from Vetline Services, Mukono and Nalongo Nankya Ruth from the same company extensively trained the farmers on the process of Artificial Insemination, highlighting the benefits and cautioning them on the mistakes. The farmers were specifically trained on the critical success factors of Artificial Insemination. These include proper heat detection by the farmer, supply of quality semen doses, optimal timing of insemination, good farm management practices and herd fertility.

[Read More](#)





More Pork Project: Supporting farmers to determine weight of pigs for more appropriate pricing

ILRI funded another component under More Pork Project on Determining Pig Weights. Over 13 pigs in each of the 162 farms of pigs in five (5) districts, including: Hoima, Masaka, Mpigi, Wakiso and Kamuli, were weighed. The exercise was aimed at assessing the pig weights in five (5) districts mentioned above.

The results provided enhanced scientific-based weighing methods as an alternative substitute for eye-based estimates which led to cheating of farmers by buyers despite the high costs of pig feeds.

In his remarks, Dr Donald Kugonza commended the Deputy District Veterinary Officer, Masaka Mr. Sserwanyira Henry for the quality of pigs that presented the best weights the district.

In a pre-assessment meeting, Mr. Sserwanyira informed the team of an outbreak of African Swine Fever in Masaka, noting that 3 cases had been identified at City Abattoirs.

Besides African Swine Fever, Mr Sserwanyira said Masaka Pig Farmers were experiencing challenges of inadequate market and high prices of feeds. He called for government intervention on the ownership of Masaka City Abattoir, following the increased misunderstanding between the corporate that manages the Abattoir and Masaka City.

Researchers Meet to Enhance Collaborations Between Animal Scientists in Breeding and Genetics



The College of Agricultural and Environmental Sciences (CAES) hosted a virtual meeting of the Uganda Animal Geneticists on 17th December 2021. The meeting was aimed at figuring out collaborations in and outside Uganda in areas of animal breeding and genetics.

In his remarks, Mr. Agaba Morris emphasized the need for more collaborations amongst African countries, saying the latter tend to collaborate more with European countries.

Dr Donald Kugonza, an Assoc. Prof at CAES presented the research activities on genetics and breeding currently being undertaken at the college especially on: chicken, fish, goats and cattle. “Our main focus in chicken breeding is: improving the quality and quantity of chicken, increasing egg production and weight,” he said.

In his remarks, Mr. Mukiibi Robert, a Research Fellow at Rosline Institute of Edinburgh, stressed the need to have a human genetics specialist on the ASUPA team. “Human genetics is lacking so much, there is need to diversify genetic research”.

Mr. Mukiibi called for enhanced sensitization of the government on the importance of genetics and genomics. He also called on the College to put in place measures to attract graduate students to animal genetics and genomics courses.



Association of Uganda Professional Agriculturalists (ASUPA) Gets a New President

ASUPA was founded on 29th November 2001 by professional agriculturalists and other stakeholders following the lack of an impartial and comprehensive national facilitator of professional dialogue on critical agricultural policy issues. The association is mandated to preserve ethical values and integrity of agriculture as a profession and enhance the commitment of agricultural professionals in developing and advocating policies and strategies for agricultural and rural development.

On 29th October 2021, out-going President, Prof. E.N. Sabiiti handed over to the incoming President, Dr Donald Kugonza at a ceremony witnessed by the Principal, College of Agricultural and Environmental Sciences (CAES), Prof. Bernard Bashaasha.

Delivering his remarks, Prof. Bashaasha applauded Prof. Donald Kugonza for accepting to take on the leadership of ASUPA despite his representation of the College on the Fisheries Council as well as many other associations. "Many people don't want to serve yet the bible is very clear on this - we were created to love and serve each other," he said.

In his remarks, Prof. Sabiiti pointed out that ASUPA is constitutionally recognized and strongly supported by several agricultural organizations including NARO and NAADS. According to Prof. E.N. Sabiiti, an idea always starts but it takes time to get roots. "Our idea 'ASUPA' has developed some roots, and only requires nurturing," he said.





Mak Recognized at the 5th Africa-Wide Agricultural Extension Week (AAEW)

Makerere University was recognized for its great contribution to agricultural research and training. This was during the 5th Africa-wide Agricultural Extension Week (AAEW) that took place on 14-20th November 2021 at Speke Resort Munyonyo in Kampala, Uganda. The event was co-hosted by the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF), the African Forum for Agricultural Advisory Services (AFAAS) and the Uganda Forum for Agricultural Advisory Services (UFAAS). Organized under the theme “Effective Agricultural Extension Systems for Sustainable Agripreneurship in Africa”, the week-long blended physical and virtual event attracted over 1,000 participants from 17 countries in Africa.

The event was officially graced by Uganda’s Prime Minister, represented by the First Deputy Prime Minister, Alhajji Moses Ali; the Minister of Agriculture, Animal Industry and Fisheries (MAAIF), Hon. Frank Tumwebaze; the Permanent Secretary of MAAIF, Maj. Gen. David Kasura Kyomukama; the President of AGRA represented by Vice President, Program Innovation & Delivery, Ms Agnes Asiimwe Konde, the President of Sasakawa Africa Association and the Commissioner of Agriculture at the African Union, among others. Key highlights that emerged include: the need to initiate and strengthen partnerships for greater impact, rebranding extension to attract the youth, and adopting gender-responsive approaches, tools and methodologies.

The latter was emphasized by Dr Harold Roy-Macauley, Regional Director, East and Southern Africa, One CGIAR, who fronted gender equality as one of the strategic directions. He also expressed a desire to link with AFAAS for scaling CGIAR innovations in Africa. Makerere University’s College of Agricultural and Environmental Sciences (CAES) is a member of the Uganda Forum for Agricultural Advisory Services (UFAAS) and was integral in organizing the event. At the event, CAES was represented by Prof. Margaret Najjingo Mangheni, the Founding Chairperson of UFAAS and Board member of AFAAS; and Dr Richard Miiro, the Board member of UFAAS representing academic institutions in Uganda. [Read more](#)



Great Advanced Course Deepens Gender Research Skills for Resilient Agricultural Systems

The vision of Gender-responsive Researchers Equipped for Agricultural Transformation (GREAT) is to create more inclusive and effective agricultural systems by addressing the priorities of both women and men in sub-Saharan Africa and beyond. After a successful Phase 1, the GREAT team at Makerere University (Uganda) and Cornell University (USA) is implementing Phase 2, with key activities focused on a course for South Asia participants; conducting research, and development of a six-year strategy for gender capacity building for the One CGIAR; and the Advanced 'Level 2' course for Sub-Saharan Africa participants.

The Advanced GREAT Course for Sub-Saharan Africa:

Held virtually over 13 days from Oct. 18 2021 to Nov. 4 2021, the course provided advanced training for fellows who took GREAT courses during Phase 1. These 30 biophysical and social scientists (14 men, 16 women) were selected from 11 agricultural research institutions in sub-Saharan Africa, with 19 trainers drawn from Makerere University, Cornell University, CGIAR, National Agricultural Research Organization and independent consultants. The course included two phases. Part 1 targeted both biophysical and social scientists, while part 2 targeted social scientists to enable participants to conceptualise, design and implement rigorous/high quality gender research and transformative development projects.

According to Margaret Mangheni, GREAT Co-Principal Investigator and professor at Makerere, the Advanced Course deepened skills and theory in gender-responsive agricultural research to contribute to resilient food and agricultural systems. "We continue to aspire to link gender and practice along the agricultural research cycle. Crop breeding remains the niche, but in this phase, we expanded it to include seed systems and resilient agricultural systems. We also continue to engage in the Community of Practice, and we'll take it beyond sub-Saharan Africa to other geographies including South Asia," Mangheni said. [Read more](#)



Mak Drylands Transform Project launched in Moroto District

Makerere University has received the blessing and support of community and administrative leaders to implement the five-year Drylands Transform project in Moroto district. This was during the project inception workshop held in the Planning Unit boardroom at the Moroto District headquarters on 21st October 2021. The inception workshop was held to kick start the project.

The meeting brought together over 20 participants comprising mainly the district technical, administrative staff, both political and those in the civil service. The meeting was also attended by representatives of different projects operating in Moroto including Welthungerhilfe project, GIZ and Karamoja Agropastoral Development Program that mainly focus on Livelihoods, food security and hunger.

The Swedish University of Agricultural Sciences is leading a multidisciplinary team of researchers from Umea University, Gothenburg University, University of Nairobi, Makerere University, World Agroforestry (ICRAF) and the Intergovernmental Authority on Development (IGAD). The project: "Achieving the SDGs in East African drylands: Pathways and challenges towards a transformation of landscapes, livestock and livelihoods in the East African drylands (Drylands Transform)", will be implemented in the greater Karamoja cluster of Uganda and Kenya. Funded by the Swedish Research Council for Sustainable Development, Formas, within their call for "Realising the global Sustainable Development Goals", the Drylands Transform project investigates the link between land health, livestock-based livelihoods, human wellbeing, land management and governance. It is aimed at contributing new knowledge for transformative change and sustainable development of rangelands in the drylands of East Africa.

[Read more](#)





Mak Granted 10 Hectares in Poron, Napak to set up Livestock Café & Tick Control Demos

Makerere University has been handed 10 hectares of land in Poron Sub-County, Napak District to set up a livestock café with a tick control demonstration site. The land was handed over from Poron Sub-County to the Napak and Moroto District Technical and Political officials and then to the University on 23rd October 2021.

The demonstration site and knowledge hub are to be implemented under the Drylands Transform project funded by the Swedish Research Council for Sustainable Development, aimed at addressing complex challenges in the East African drylands such as climate change, food insecurity, land and ecosystem degradation and weak institutions.

Drylands Transform investigates the inter linkages between land health, livestock based livelihoods, human wellbeing and land governance mechanisms in order to contribute to transformative change and sustainable development of the social ecological system in drylands of East Africa.

The 10 hectares were handed over following a series of meetings between the Makerere University research team and Napak and Moroto District Local Governments and Poron Sub-County Technical and Political officials, wherein the research team sought permission and support to implement five-year project activities for the benefit of the agro- pastoralists and pure pastoralists.

Makerere University's Principal Investigator Prof. Denis Mpairwe thanked the Parish, Sub-County and District technical and political units for the support and offer. He said the offer followed field visits and meetings with stakeholders, users and land owners as well as the Sub-County officials in areas where the project activities will be piloted. [Read more](#)



Mak Secures another 10 Hectares in Rupa Sub-County Moroto for Livestock Café

Makerere University has secured an additional 10 hectares of land from the pastoralist community in Rupa Sub-County, Moroto District for establishment of a livestock café. The allocated land comes with a valley tank and cattle crush. This was the Drylands Transform project's second land offer in the Karamoja sub-region following the first in Poron Sub-County, Napak District. Livestock cafés will be the experimental sites to study forage productivity, establish novel co-learning and knowledge exchange centers and create opportunities for milk and fodder value chains.

The land was handed over to the project by Moroto District and Rupa Sub-County Technical and Administrative officials and witnessed by clan leaders at Lokapel Village on Sunday 24th October, 2021. The handover ceremony was attended by the Local Council (LC) V Chairman Mr. Loru Moses, the LCV Woman Councillor Ms. Lochoro Clementina, the LCIII Chairperson Mr. Adipa John Robert Akiki, the Speaker Mr. Komol Parl Miki and the LCI Chairman Lokapel village Mr. Lotee Nangiro. Also present were the Youth Representative and Clan Elders Mr. Achok Lopeima and Mr. Eluktoper Ngorok.

The valley tank and cattle crush within the project site university were also handed over to the research team and supplemented by an alternative site in the event of insecurity during the December –January dry spell.



Speaking at the project site during the inception meeting, the clan leaders led by Mr. Achok Lopeimal said the community accepted to offer the land to the project and expressed willingness to protect and utilize it after the project cycle. The clan leaders also asked the researchers to include the conservation of the indigenous plant species in the livestock cafés. The species identified for conservation include; Ekapelimea (for treatment of cough and chest infections), Ekodoli (for treatment of wounds), Eusugu (a remedy for infections and chest pain), Ekorete (for diarrhea and milk enhancement) and Etoke (used as fruit and remedy for stomachache). [Read more](#)





Department of Agricultural Production Academic Field Trip

Academic field trips form an important component in the curriculum of Third Year students of Bachelor of Sciences in Agricultural Land Use and Management. The trips expose students to landscape management challenges and build their capacity in diagnosing field problems common among the farmers. The annual field trip mainly focuses on Land Use Planning, Land Use Impact Assessment and Soil Productivity Assessment. However, other related courses such as soil and water conservation, waste management, soil and water pollution, soil fertility, and pedology are described during the trip.

The Master of Science in Soil Science students take lead in the collection of geo-referenced soil samples, soil survey, soil profile description and classification along different landscape positions. At the end, the MSc Soil Science group overlays geo-referenced soil information on to old soil maps, in their field reports. With support from the University, the Department of Agricultural Production, School of Agricultural Sciences, College of Agricultural and Environmental Sciences (CAES) conducts annual field trips for third year students of Bachelor of Science in Agricultural Land Use and Management and Bachelor of Science in Agriculture IV (Soil science option). The Department also conducts field trips for Master of Science in Soil Science and Master of Science in Integrated Watershed Management students.

The trip contributes 40% of the total final exam assessment. In the course of the trips, students are furnished with practical knowledge on: (i) the state of land use as well as soil and water quality on major croplands and catchments; (ii) the impact of land use and land use changes on natural resource quality and social-economic development; (iii) potential drivers of changes in the land use and water resource quality over years and the best management interventions for sustainable use; (iv) rangeland use and management-opportunities and challenges; (v) the processes involved in management of large-scale farms/projects; and (vi) the spatial physical planning approaches, the associated challenges and the possibility for re-planning and restoration of the degraded ecosystems.

The 2020/2021 Field Trip

The trip for the 2020/2021 Academic Year had been planned for Kumi, Soroti, Katakwi and Moroto districts but was re-planned to nearby places due to time constraints caused by the COVID19 lockdown restrictions and insecurity in Karamoja. The trip was conducted in Mpigi, Masaka and Sembabule districts between 8th-13th November with the overall aim of exposing students to the practical challenges and opportunities that exist in the use and management of soil, water and wetlands. This particular study involved characterizing and mapping of selected landscapes using a GPS; studying maps and ground truthing land use changes; making field observations and conducting interactive discussions with local guides and lecturers; soil and water sampling; solid waste sampling; and sediment sampling.

Sub-activities implemented at the different sites included;

Mpigi District

1. Understanding the land use plan of the National Farmers' Leadership Centre (NFLC) and how this has supported sustainable land use and integrated agro enterprises (Field crops, horticultural crops, livestock)
2. Assessing the land uses and technologies at the centre and their impact on the livelihoods of surrounding communities
 - Understanding the entire process of sand mining at Lwera and assessing the impact of this land use activity on the environment
1. Assessing the major challenges the sand mining company faces in adhering to standards set out of the Environmental Impact Assessment (EIA).
2. Developing a sustainability plan
3. Assessing the opportunities to the surrounding communities and the country at large

Masaka District

1. Assessing causes and drivers of wetland degradation
2. Land Use Planning: presentation of a proposed Land Use Plan for Ecotourism around L.V shores
 - A visit to L. Victoria shores and Lake Nabugabo incl. Ramsar Heritage Sites
1. Land Use Impact Assessment

Sembabule District

1. Banana-Coffee Farming Systems: Contrasting well managed and poorly managed
2. A visit to a model farm: Crop-Livestock integration / Water-Energy-Food Nexus
 - Range lands and their management: Opportunities and Challenges

Key outputs/Key results:

1. Students were able to develop land use maps of some catchments
2. Students carried out soil suitability assessment across the visited districts
 - Land management options were proposed by staff and students
1. The Students collected 50 soil samples and 20 water samples for their special projects
2. The impact assessment of sand mining at Lwera on the environment was performed and sustainability plan was proposed
3. Photos were capture and video clips were recorded to aid teaching

The trip was coordinated by Dr Emmanuel Opolot. It was attended by several members of staff from the Department of Agricultural Sciences namely: Assoc Prof Twaha Basamba Ateenyi, Dr Giregon Olupot, Dr Patrick Musinguzi, and Dr Isaac Newton Alou. [Read more](#)

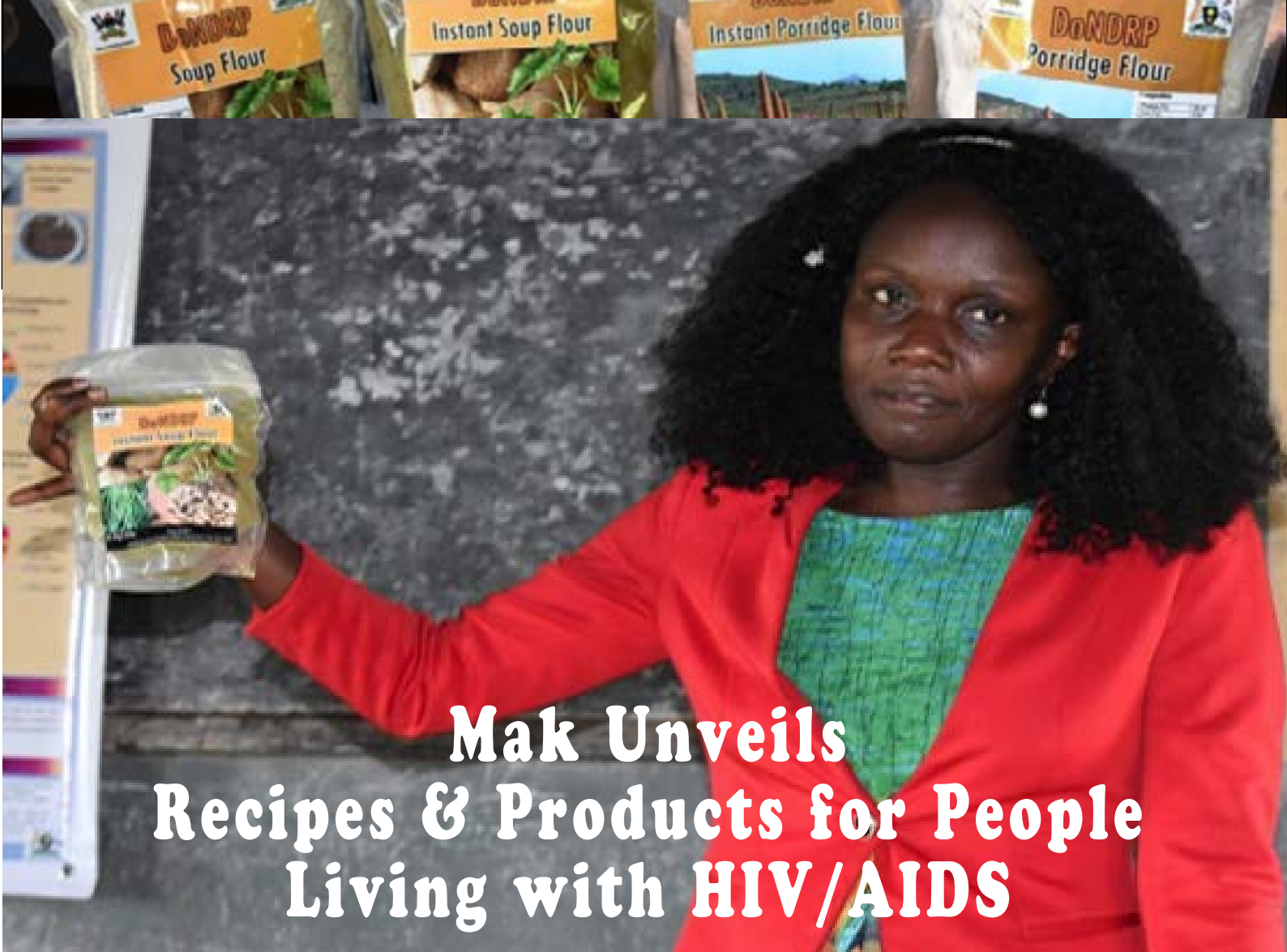


244 Ugandan University students for AgroStudies Internship in Israel

244 students from five universities- Makerere, Kyambogo, Gulu, Busitema and Bishop Stuart University have been flagged off to Israel for a one year paid internship. Out of 244, 10 were female. The students were flagged off by the Vice Chancellor of Makerere University represented by his Deputy in charge of Finance and Administration (DVC F&A) Assoc. Prof. Josephine Nabukenya on 13th October, 2021 at a colorful ceremony held at the Central Teaching facility 2 at Makerere university. The function was also attended by a team from AgroStudies center in Israel led by the CEO Mr. Yaron Tamir, representatives from the participating Universities in Uganda-, Principal, College of Agricultural and Environmental Sciences (CAES), Alumni and Coordinators of the AgroStudies Apprenticeship Programme from the five universities.

Prior to the flag off, the AgroStudies CEO Mr. Yaron Tamir and his deputy paid a courtesy call on the Vice Chancellor where they discussed matters of interest to the university and the Government of Uganda especially a plan to start an AgroStudies Alumni cooperative in Uganda and the possibility of the program Alumni to support government in providing extension services. The Agro studies cohort 2021/2022 was organized under the theme, "Securing the Future Uganda through Agriculture Capacity Building". At Makerere University, the programme was coordinated by Dr. Mildred Ochwo-Ssemakula and Dr. Narisi Mubangaizi from the School of Agricultural Sciences, College of Agricultural and Environmental Sciences. The students' participation in the AgroStudies agriculture capacity building program is a response to the need to transform from subsistence to more commercial agriculture in a bid to secure the future of Uganda. [Read more](#)





Human Immunodeficiency Virus (HIV) is a global pandemic that is currently affecting 3.7 million people worldwide of which 70% are found in sub-Saharan Africa. Uganda continues to suffer from the scourge of HIV with the current prevalence of 7%. Healthcare of people living with HIV/AIDS in Uganda is constrained by poor nutrition with estimates of 25% suffering from malnutrition. A team of researchers led by Dr. Agnes Nabubuya from the Department of Food Technology and Human Nutrition in October 2020 embarked on the study titled, "Development of Nutrient-dense Recipes and Products from Underutilized crops to alleviate Malnutrition among HIV/AIDS Infected persons in Western Uganda (DoNDRP)".





The study was fully funded by the Makerere University Research and Innovations Fund (Mak-RIF). Other members on the research team are Paddy Ainebyona, Dr. Robert Mugabi, Dr. Ivan Muzira Mukisa from the Department of Food Technology and Human Nutrition and Dr. Immaculate Nakalembe from the College of Veterinary Medicine, Animal Resources and Biosecurity (CoVAB).

On 9th October, 2021 the research team unveiled four formulations of the neglected crops namely: Raw soup products, Instant soups, Raw porridge products and Instant porridge at Kigoroby sub-County. The Raw and Instant Nutrient-Dense porridge and soups were developed from neglected crops such as yam and yam leaves, climbing nuts, millet and cowpeas among others. The nutritional composition for an optimal porridge is Proteins (20.4%), Crude fibre (13.26%) Carbohydrates (42.21%), Iron (26.78mg/l), Zinc (42.75 mg/10 while the nutritional composition for an optimal soup is Proteins (25.69%), Crude fibre (20.53%), Carbohydrates (36.27%) Iron (23.14 mg/l) and Zinc (38.92mg/l).

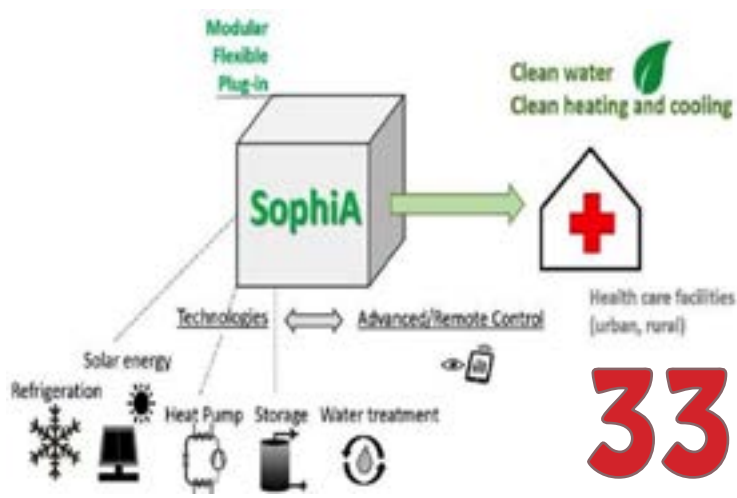




Project Launch: Sustainable Off-Grid Solutions for Pharmacies and Hospitals in Africa

Makerere University on 8th December 2021 officially unveiled an African project to Benefit Health Facilities across the continent. The Project is called sustainable Off-grid solutions for Pharmacies and Hospitals in Africa (SophiA). The launch was presided over by the Vice Chancellor of Makerere University Professor Barnabas Nawangwe. The SophiA project will benefit both Makerere and the Health system in remote parts of the country by granting access to off-grid carbon-neutral electricity, heating and cooling of food and medicines, storage of vaccines up to -70°C as well as access to safe and clean drinking water. Makerere is partnering with 13 organizations across Europe and Africa in the project funded by the European Union to ensure extended support to Health Centre Fours (HC IVs) across four African countries. It will be a 4-year multi-disciplinary project with activities in Burkina Faso, Cameroon, Malawi, and Uganda.

Makerere University will take the lead in two of the project's nine work packages. Work Package 1 (WP 1) is aimed at assessing the needs of several health facilities in the above mentioned countries in order to identify and match in each country ONE most significant and suitable health facility. The facility, which must be located in a rural remote region of the country will then be served by a SophiA system on a pilot basis. Makerere will also take the lead in work package 7 (WP 7), which will investigate the environmental, economic, and social aspects to demonstrate the benefits of SophiA solutions. During the launch, Vice Chancellor congratulated the team upon winning the grant adding that it is projects of this nature that will help Makerere implement its new strategic plan.





Unlocking the Potential of Kasese Smallholder Farmers' Urban Food Systems Resilience for Food Security

AgriFoSe2030 Programme is a global initiative on agriculture and food security funded by the Swedish government. The programme has three (3) main thematic areas of consideration in the field of agriculture and food security: (1) Training and capacity building, (2) High quality synthesis and analysis and (3) Innovative platforms and Knowledge networks. The challenges aligning with the thematic areas AgriFoSe2030 addresses include: (1) Improving access to safe and nutritious food, (2) Agricultural productivity and ecosystem functions, (3) Science-based innovation and extension and (4) smallholder agriculture within transforming food systems.

In response to these challenges, AgriFoSe2030 is implementing four projects in different countries: (1) Transformation of pastoral livelihoods in Kenya, addressing challenge 1 and 4, (2) Smallholder and the e-commerce of fruits in Vietnam, (3) Food systems resilience in Uganda and (4) Food Systems governance in Kenya. Makerere University, through the Department of Geography, Geoinformatics and Climatic Sciences, in collaboration with the Swedish University of Agricultural Sciences and Lund University is implementing a project on Unlocking the Potential of Smallholder Farmers Urban Food Systems Resilience in Uganda Agriculture for Food Security (AgriFoSe2030).





The project is being implemented in two areas: Kasese municipality and Mbale city. The objectives of the project include: (1) Assessing the key vulnerabilities to urban food systems, (2) Facilitating a process of coming to agreement on the key priority areas and/or policies or actions and (3) Supporting decision makers to develop evidence-based policies and activities. Makerere University is the lead institution on the project, represented by the College of Agricultural and Environmental Sciences under the Leadership of Professor Frank Mugagga, Head Department of Geography, Geoinformatics and Climate Sciences. AgriFoSe2030 project funds One (1) PhD student and two (2) masters students in the Department of Geography, Geoinformatics and Climatic Sciences.

The project led by Prof. Mugagga organized a two-days' workshop as a follow-up on the mini survey conducted between 3rd and 9th October 2021, to ensure that smallholder farmers and decision makers within Kasese Municipality have a changed attitude towards smallholder farming and that decision makers recognize smallholder farmers as key players in the urban food risk reduction. The workshop was also intended to ensure that decision makers explicitly initiate processes and establish mechanisms through which smallholder farmers are able to fully participate as key stakeholders. The workshop was held from 13th to 14th December 2021, at Rwenzori International Hotel in Kasese Municipality.

The workshop was aimed at: (1) Sharing findings from the stakeholder engagements and mini survey conducted between 3rd and 9th October 2021, (2) Providing space for informed policy dialoging among stakeholders, (3) Sharing and exchanging knowledge and best practices, (4) conducting a risk and capacity needs assessment and (5) Co-creating of knowledge and (6) Networking. [Read more](#)

Academia & Local Govt. Officials in West Nile Sensitized on Forestry & Biodiversity Conservation

Over 60 participants comprising academia, local government officials, the private sector and civil society organization on 2nd December 2021 converged at Muni University in Arua district to dialogue on the status of forests and bio diversity in West Nile region of Uganda. The policy dialogue was organized by EfD-Mak Centre in collaboration with Muni University and Arua District Local Government under the theme, “Forestry and Biodiversity: Addressing the challenges of Forest Degradation and enhancing Environment Management in Uganda”.

Arua threatened by high Refugee influx and atrocities on the environment

The Ag. Director EfD-Mak Centre Fred Kasalirwe said Arua was selected because a lot of atrocities committed on nature in the region and the fact that Arua Local Government has been at the fore front of this because it is the mother district for all. Kasalirwe said there is an influx of refugees and refugee settlements in the region who interface with nature directly because they lack alternative sources. Most of the charcoal and firewood supplied in Kampala and other towns come from West Nile and this has led to the loss of indigenous tree cover. Whoever tries to replace goes for eucalyptus and pine also impacting on the flora and fauna.

“One of the mandates of the centre is to reach out to policy makers and implementers and other stakeholders in the field of environment and natural resources because the policies are implemented at the local government levels. So reaching out to local governments helps to understand what is on ground and when we sit to make policy recommendations, we have voices from the lower local government levels. The voices gathered from the engagement and debate will be taken up through drafted policy briefs and then we organize a national level dialogue with combined voices from all districts visited, identify policy gaps and engage the ministers and advocates who are parliamentary committees on environment, natural resources and agriculture to air out voices on the parliament floor,” said Kasalirwe.





**The Ag. Director EfD-Mak
Centre Uganda Fred Kasaliwe**

Forest depletion in West Nile higher than the national rate

The representative of the Vice chancellor Muni University Prof. Robert Kajobe who is Dean school of Agriculture and Environmental Sciences said the degradation of the environment and forests in the region is relatively more that the national rate. “We have over 40 years of degradation which has worsened. Uganda has 1.4million refugees and out these over 1million refugees are in West Nile alone. These added to the native population of 3 million culminates to 4 million people looking for materials for construction, fuel wood and charcoal and the toll is on the environment. Before the refugee status West Nile was known for tobacco growing and the tobacco depleted the soil in the region for a long time because when they were curing tobacco they were using fuel wood selecting indigenous trees which were important with residual values leaving the ground bear,” the Vice Chancellor reported.

Prof. Kajobe decried that West Nile region used to have two rainy seasons (March to May) and another longer one (July to November or up to early December) but in the last three years, the region has had one season of drought from December up to May. In addition he said there is scarcity of construction materials and fuel wood forcing women and girls to walk 3-5km looking for fuel wood and while hunting for wood, conflicts arise, they are bitten or raped.

The region he reported is experiencing food insecurity due to soil depletion caused by clearance of the forests and because of the drought, annual crops cannot do well while perennial crops like tea cocoa, banana and coffee are no more. [Read more](#)

**Prof. Robert Kajobe
delivering the keynote
address**





Prof. Jacob Agea (L) shows off outputs of his research project



Prof. Phinehas Tukamuhabwa (2nd R) showcasing improved soybean varieties

Mak RIF, CAES Open Day

Plans are underway to establish a University-wide Research and Innovations Incubation Centre. This was revealed by the Vice Chancellor, Prof. Barnabas Nawangwe during the College of Agricultural and Environmental Sciences (CAES) Open Day held on 14th December 2021 to showcase outputs of some of the research projects supported by the Government of Uganda through the Makerere University Research and Innovations Fund (Mak-RIF). The event was presided over by the Permanent Secretary, Ministry of Agriculture, Animal Industry and Fisheries (MAAIF), Maj. Gen. David Kasura Kyomukama. It was attended by, among others, the representative of the Chair Grant Management Committee, Assoc. Prof. Isa Kabenge; stakeholders in the agricultural sector; the Principal, CAES, Prof. Bernard Bashaasha; the Deputy Principal, Dr. Gorette Nsubuga Nabanoga; members of the Mak-RIF Secretariat led by Ms. Phoebe Kamy Lutaaya; and members of staff and students of Makerere University.

Touring the exhibition stalls, the Vice Chancellor said Management was fast-tracking the formation of a university-wide Research and Innovations Incubation Centre to support researchers to improve their prototypes. "The projects we have seen today are very impressive. It is gratifying to note that our researchers are actively working with communities to address various challenges. This is clear testimony that we are on the right track as a University. I take this opportunity to congratulate all researchers for the great innovations," he said.

Emphasizing the critical role played by universities in the development of nation states, the Vice Chancellor said Makerere had reached a stage of churning out companies that can transform the country's economy in the shortest time possible. "Through the Research and Innovations Incubation Centre, this can be achieved. It is our responsibility to ensure our country remains stable by creating employment for multitudes of young people, and enhancing food security. I therefore appeal to the government to support the establishment of the centre."



The Vice Chancellor reminded the researchers of the need to patent their work. He also advised them to work towards commercialising their products. He expressed gratitude to the Government of Uganda for the continued support towards research and innovations at Makerere University. He also appreciated the University Grant Management Committee for negotiating the support and ensuring it is put to good use. The Vice Chancellor commended the Mak-RIF Secretariat for working tirelessly to ensure the research conducted does not remain on the shelves but is widely disseminated to foster uptake and economic transformation.

During the event, researchers from CAES showcased outputs of various projects including;

1. Unlocking the commercial potential of *Canariumschweinfurthii* (Empafu) indigenous fruits for improved livelihood in Central Uganda – Prof. Jacob Agea. The main objective of the project was to develop high value commercial innovations from the fruit. Specific objectives were to formulate high value wine and jam innovations from the fruit pulp and to assess consumer market acceptability for developed wine and jam innovation.

2. Design, construction and evaluation of an automated continuous pasteurizer –Dr Emmanuel Baidhe, Dr Julia Kigozi. Along the juice processing chain, thermal processing by pasteurization is considered to be the most crucial of all unit operations as it increases the shelf life of the juice. Several batch pasteurizers have been locally developed and adopted. However, with the batch system, a particular volume of product is processed per unit time. It is therefore very cumbersome for a processor with large volumes since they have to keep emptying and refilling the vat. It requires a lot of resources in terms of labour (Amit et al., 2017), time and energy to have large quantities of juice processed. The purpose of the study was to design, simulate, construct and assess the performance of the low-viscous juice continuous pasteurizer.

3. Enhancing Value addition on Potato-Sorghum enterprises for Improved Livelihoods in Uganda (EVaPoSIL) -Prof. Johnny Mugisha. Potato (*Solanumtuberosum*) and sorghum (*Sorghum bicolor*) are potential pathways for enhancing household incomes, food and nutrition security in South-western Uganda which is characterized by land scarcity, decreasing agricultural productivity, high post-harvest losses and low per-capita income. Potato and sorghum are the region's main enterprises but their economic and nutrition potential are not fully exploited. Sorghum productivity and profitability are very low and potato harvest losses in form of non-marketable tubers are high. The project sought to enhance the value of both crops by innovative value addition that makes them complements, reduce harvest losses, increase incomes, and make available to consumers a diversity of high quality products. The overall objective was to improve the economic value of potato and sorghum enterprises for improved livelihoods of the value chain actors.

4. Developing dry season feeding technologies for different cattle production systems in Uganda – Dr Justine Nambi-Kasozi. Scarcity, high cost and fluctuating quality of feeds are major constraints to sustainable cattle production in Uganda, particularly during the dry seasons. Use of crop residues plays an important role in reducing feed stress. However, most crop residues are bulky and low in nutrient content hence unable to support maintenance and production requirements of cattle. The objective of this project was to develop crop residue-based multi-nutrient blocks (MNB) and pellets to increase the intake and utilization of crop residues for dry season feeding.

5. Digitalizing the Makerere University Soil Test Kit for rapid soil assessment, improved soil management, crop yields and incomes among farmers in Uganda – Emmanuel Opolot. Accurate assessment of soil is key for its sustainable use and management. The Makerere University Soil Test Kit (MAK-STK) comes in handy. It gives results of five soil parameters (pH, N, P, K and SOM) within minutes. However, the results from the MAK-STK are qualitative and thus hard for agricultural extension workers to advise farmers on how much nutrients to add to the soil. The project objectives were to (i) calibrate the MAK-STK with laboratory data for major soil types in Uganda, (ii) develop a digital platform through which the MAK-STK results can be quickly and easily translated to fertilizer recommendations and (iii) build capacity of the agricultural extension officers, farmers and fertilizer input dealers on the use of the Makerere University Soil Test Kit and its digital platform.

6. Development of a Safe and Efficacious Anti-malarial drug from Traditional medicine -Prof. John Tabuti. Malaria is still a leading source of illness and death. In 2017, about 219 million suffered from malaria worldwide, with 92% of cases occurring in Africa. Malaria management is complicated by the fact that access is still limited in some places, and there is a possibility of treatment resistance. The goal of this research was to contribute to the development of a safe and efficacious anti-malarial. The specific objectives were: to compile a list of malaria treatment plants in Tororo District and prioritize them to determine the safety of the malaria treating plants.

7. Deployment of the new Maksoy soybean varieties for on-farm income enhancement, Food and Nutrition security, Enterprise Development and Job creation in Eastern Uganda – Prof. Phinehas Tukamuhabwa. Over the last 10 years, Makerere University developed six improved soybean varieties namely MAKSOY 1N, 2N, 3N, 4N, 5N and 6N. Unfortunately, the potential of the new MAKSOY soybean varieties had not been fully exploited due to limited farmer access to seed in addition to low skill set in soybean agronomic practices that subsequently leads to low yields. Further, each of the soybean varieties has specific attributes for protein, oil, maturity and yield in the field and efforts had been made to enhance their adoption in different parts of Uganda. However, the role of soybean in contributing to food and nutrition security of different households and communities in the country remains a critical challenge. This project focused on harnessing the value of the different soybean varieties through value addition using soymilk and soy flour for adoption by households, SMEs and also to set up a Soy Processing Unit at MUARIK.

8. Improving access to biodiversity data for conservation decision making: A case of the National Biodiversity Data Bank, Makerere University, Uganda – Daniel Waiswa. This project sought to revitalize the NBDB as a one-stop biodiversity data centre enabling easy and fast access for sound biodiversity conservation decision making. The overall objective was to improve access to biodiversity data for conservation decision making while the specific objectives were to: increase stakeholders' engagement and confidence in the NBDB for enhanced biodiversity data sharing and access, re-designing and operationalizing the NBDB Database for reception, storage and open access to data and enhancing and sustaining the staffing, capacity and infrastructure of the NBDB.



9. A Pedal-Operated Seed Cleaner (PoS-Cleaner) To Boost Post Harvest Grain & Legume Quality, Increase School-Study time & Create Financial Freedom in Rural-Uganda – Peter Tumutegyereize. Sub-Saharan Africa (SSA) annually registers 40-50% of food Post-Harvest Losses (PHLs) worth US\$4 billion with 41% and 26% respectively grains & legume losses in Uganda. Maize grains lost alone, could feed over 1.14 million persons for a full year. These losses along the food chain are greatly attributed to poor seed sorting or cleaning. Unclean seeds and foreign materials promote mold development resulting to dry matter loss, nutritional changes, seed quality loss, aflatoxin contamination and PHLs during storage and processing. Despite this, majority of small-scale farmers have no access to appropriate seed cleaning technologies. The available imported seed cleaners in Uganda are energy and cost demanding in terms of ownership, operation and maintenance. Farmers depend on traditional screening or winnowing which is inefficient, time consuming, labour intensive and dust exposure resulting into ill health. For rural schools that depend on in-kind food tuition contributions from parents, students traditionally clean seeds hence reducing their study time and educational performance. The study sought to create intermediate but appropriate post-harvest cleaning technologies.

7. Developing an automatically controlled commercial solar-dryer and efficient resource recovery innovations for sustained market responsive fruit production in Uganda -Ahamada Zziwa. Food insecurity and poor livelihoods continue to prevail in Uganda partly due to high post-harvest losses, limited value addition options and low farm-gate prices particularly for perishable foods (FAO, WFP and IFAD, 2019). The lack of affordable preservation options contributes to over 30% post-harvest losses because majority of farmers have no access to electricity for processing and preserving perishable foods. Harnessing solar energy and its use for food preservation is a viable option for most off-grid farmers. However, the existing solar dryer designs are limited in drying efficiency due to absence of temperature and relative humidity controls which undermines their ability to ensure consistent physical and nutritional quality of dried products. Most dryers are also small drying capacity designs based on only solar light as the drying power which renders them unsuitable for large scale drying and uneconomical (Shaikh and Kolekar, 2015). The project aimed to: 1) design, construct, test and promote a sensor-controlled dual heat source (Hybrid) solar dryer to ensure consistent drying of reasonably large volumes of perishable produce; 2) investigate vermicompost recovery from pineapple waste and cow dung; and 3) optimise biogas production from pineapple waste.



11. Development of Nutrient-Dense Recipes and Products from Underutilized Crops to Alleviate Malnutrition among HIV/AIDS Infected Persons in Western Uganda – Agnes Nabubuya. Human Immunodeficiency Virus (HIV) is a global pandemic that is currently affecting 3.7 million people worldwide of which 70% is found in Sub-Saharan Africa. Uganda continues to suffer from scourge of HIV with current prevalence at 7%. Healthcare of people living with HIV/AIDS (PLWHA) in Uganda is constrained by poor nutrition, with estimates of 25% suffering from malnutrition. This project addressed the challenge of malnutrition in PLWHA by using underutilized crops through development of nutrient-dense recipes and products. The research team analysed the nutritional composition of identified underutilized crops and developed nutrient-dense recipes and products for PLWHA.

12. Strengthening the resilience and visibility of peri-urban poultry farmers in Wakiso for better marketing and profitability through feeding, post-harvest handling, value addition and resources recovery – Ahamada Zziwa. Globally, COVID-19 has had adverse impacts on the poultry value chain through infecting workers, farmers, stalling production, disrupting the supply chain, and thus affecting product demand. The lockdown led to socioeconomic restrictions and distortions in community dynamics, marketing and sale of products leading to huge losses in the poultry sector (FAO, 2020; Poudel et al., 2020). Transport restrictions to poultry farmers and closure of national borders, weekly markets, institutions, schools, hotels and restaurants, which were the main markets, left farmers with large quantities of unsold poultry products, resulting in financial losses especially to farmers without value-addition options and resources recovery innovations. The overall objective of the project was to strengthen the resilience and visibility of peri-urban poultry farmers for sustained poultry production, better marketing and enhanced profitability through innovative feeding, post-harvest handling, value addition and resources recovery.



13. Optimized software for planning and simulation of food aid response during the COVID-19 pandemic and other similar disasters in Uganda – Fildah Ayaa. Covid-19 was declared a pandemic on 11th March 2020. First lockdown measures to contain the spread of the virus effected on 31st March 2020. Covid-19 lockdown disrupted food supply systems, causing food insecurity, especially in urban areas. Uganda's government food distribution efforts were frustrated by poor planning for both food stock and manpower. Only 12 % of the total population received food aid during lockdown period. Of these, 24% were urban residents and only 7% lived in rural areas (Acayo,2020). The research team designed software for authorities to plan for food distribution during and after the Covid-19 pandemic in Uganda.

14. Development of a Green Low Cost Touchless Handwash Technology (TW-20 Kit) For Public Shared Spaces – Joshua Wanyama. Effective hand washing with soap for at least 20 seconds and limiting contacts are useful COVID19 preventive measures. However; the existing point-of-hand washing systems are ineffective in achieving the set measures as most of them require individuals to touch the units, have no mechanism in place to ensure hand washing with soap for the recommended time and are therefore prospective contagion points for the pandemic (WHO 2020). There was therefore, a need to develop a low-cost hand washing technology that automatically releases soap detergent without contact and allows users to rub and scrub the hands with soap for 20 seconds before water is released for rinsing. The project aimed to provide a safe water and hygienic technology to boost behavioural hand washing culture and reduce the risk of SARS-COV-2 human to human transmission in public shared spaces. The specific objectives were: i) to re-evaluate and modify the first prototype of TW-20 Kit V1.1 design customized for public settings, ii) to influence public behavioural change towards hand hygiene and product validation by undertaking a comprehensive pilot study in selected shared public spaces in Kampala Metropolitan Area.

15. Design and development of an atomized spray drier for egg powder production for use in bakery industries of Uganda – Kivumbi Hussein Balimunsi. Due to the introduction of fast growing breeds of chicken in Uganda, there has been enormous production of high quality eggs, making the country one of the largest egg producers in the region. However, due to the outbreak of COVID19 and the subsequent lockdowns, the prices of eggs drastically reduced to nearly 5000 UGX per tray consequently affecting chicken farmers. This was further worsened by the lack of value addition to the available eggs leading to huge losses. This project sought to explore the utilization of spray drying in the production of high-value products from eggs in Uganda as a measure to minimize losses.



16. Automation of communal hand water pumps to eliminate COVID-19 transmission – Nicholas Kiggundu. The research was motivated by the observation that alternative solutions of limiting the spread of COVID-19 such as washing hands with water and soap or use of chemical sanitizers are difficult to enforce especially in the low income rural and peri-urban communities where the boreholes are found. The researchers invented MAKNAI an acronym for the Makerere University – MAK NAYIkondo – vernacular for borehole, a prototype to automate cranking of the hand pump that draws water from a well. Designed by a team from the Department of Agricultural and Biosystems Engineering (DABE), School of Food Technology, Nutrition and Bioengineering (SFTNB), College of Agricultural and Environmental Sciences (CAES) the prototype consists of a PV (photo-voltaic) panel, battery, solar charge controller, inverter, motor, pulleys, belt, reciprocating arm and a foot switch. The foot switch serves to replace the use of palms and fingers to crank the pump handle, as is the practice while drawing water at boreholes.

17. Empowerment of the Agro-Processing Industry to meet the Quantity and Quality Standards for the Local and Export Market; a Programme Enhancing the Practical Skills of Students in Makerere University – Julia Kigozi.

18. Mountain Gorilla Tourism Re-examined: Implications of increased visitor numbers to the welfare and behaviour of mountain gorillas in Bwindi Impenetrable National Park, Uganda – Prof. David Mwesigye Tumusiime.

19. Developing Biofertiliser Formulations to Unlock Crop Productivity for Improved Food Security and Household Livelihood in Uganda – John Baptist Tumuhairwe. Read more





Training of Mak Academics in systematic reviews

In a bid to enhance and promote evidence-informed policymaking, review and reform in the forestry, tourism, agriculture and other sectors which are key to Uganda's socio-economic development, the Department of Forestry, Biodiversity and Tourism is conducting trainings in Systematic Reviews for Postgraduate Students and Staff of Makerere University. This training is being implemented under the auspices of the Carnegie-funded SECA Programme. The trainings took place on December 10th, 17th, 21st 31st 2021 and 5th January 2022 from 10:00am-12:00pm on each of the days.

*****Topic:** Capacity Building in Systematic Reviews

*****Host:** Assoc. Prof. Edward N. Mwavu, Head Department of Forestry, Biodiversity and Tourism, CAES

*****Trainer:** Dr Moses Ocan, College of Health Sciences

Graduate Students Research Seminar



Under the Carnegie African Diaspora Fellowship Programme, the School of Forestry, Environmental and Geographical Sciences together with the Department of Forestry, Biodiversity and Tourism Delivered a blended graduate students' research seminar on Thursday, 2nd December 2021 at 2:00pm.

*****Topic:** Links between Conservation, Tourism & Communities – Research Lessons Learned

*****Presenter:** Dr. Ian Munanura, an Assistant Professor from Oregon State University, USA

Tribute to the Fallen Prof. Noble E. Banadda



Hundreds of mourners on Friday 2nd July, 2021 hooked onto social media platforms to pay their last respects to the Makerere University don and iconic Professor, the Late Noble Ephraim Banadda, Banadda succumbed to COVID-19 on 1st July 2021 at Case hospital in Kampala after battling for his life for about one month. The church service conducted physically and online at Makerere University's School of Food Technology, Nutrition and Bioengineering attracted 500 participants on zoom, 78 on Facebook, 80 on YouTube, 40 on Instagram and 100 on twitter. The function was graced by Makerere University Top Management including Council Chair Mrs. Lorna Magara, the Chancellor, Prof. Ezra Suruma, the Vice Chancellor Prof. Barnabas Nawangwe and his Deputies. The service was also attended by the Principal College of Agricultural and Environmental Sciences Prof. Bernard Bashaasha, the Dean School of Food Technology, Nutrition and Bioengineering Dr. Abel Atukwase and MUASA Vice Chairperson, Prof. Edward Mwavu.

Prof. Banadda was born in Kampala, Uganda's capital city on May 14, 1975. After attending local primary and secondary schools, he was admitted to Sokoine University of Agriculture, in Morogoro, Tanzania, graduating with a Bachelor of Science in Food Science and Technology. His Master of Science degree in Process Engineering, together with his Doctor of Philosophy degree in Chemical Engineering, were both obtained from Katholieke Universiteit Leuven, in Leuven, Belgium. Later he studied in a post-doctoral fellowship at the Massachusetts Institute of Technology, in the United States. He joined the Makerere University service on 1st June, 2006 on a temporary appointment as lecturer in then Department Department of Food Science and Technology.



He was the first African recipient of the Pius XI Golden Medal 2018 in the Vatican Rome – the first African under the age of 45 to be recognized by a sitting pope. He was a Laureate of the Next Einstein Fellowship; Alumni of the Global Young Academy; Member of the Malabo Panel of Experts; Fellow of the Uganda National Academy of Sciences; Council member of the Pan African Society for Agricultural Engineering; Member of the Makerere University Senate; Adjunct Professor at Iowa State University (USA); Research Fellow at Clare Hall at University of Cambridge (UK); and college member of the UKRI GCRF programme. In October 2020, Prof. Banadda was inaugurated Oliver Reginald Tambo Research Chair honored young scientist at the World Economic Forum attracting USD 250, 000 annually and an additional £ 100,000 Euros for the next 15 years for graduate research in Agricultural waste management with a target of training 15 PhDs, 9 Post-doctorals and 27 MSc. His research focus areas were in the bio-systems engineering field and include mathematical modeling of biological systems and interactions. His goal was to create value-added products from solid bio-waste resources.

Later, he was appointed Lecturer on 1st July 2011 and was one of the beneficiaries of the fast track promotion system and was promoted to the rank of full professor on 1st August, 2012 and later confirmed on 1st January 2012. In 2013 Prof. Banadda was appointed Head Department of Agricultural and Bio-systems Engineering served for four years and re-elected effective 1st September 2017 to 31st August 2021. Prof. Banadda made an indelible mark with his youthful and dynamic leadership as head of department and his sharp intellect and dedication to his students will not be soon forgotten. Under his leadership, the Department of Agricultural and Biosystems Engineering was a leader in providing engineering solutions to agricultural problems in Uganda and Africa. Prof. Banadda had a trailblazing scientific career. He was the first Sub-Saharan African to graduate with a PhD in Chemical Engineering from the Katholieke University Leuven in Belgium opening many doors for Africans. He was appointed as full professor in 2012 at the age of 37, one of the youngest persons in the history of Makerere University.



Prof. Banadda raised the flag of Makerere University at both local and international scene. Every year Prof. Banadda had a technology or an innovation to launch. He was the brain behind the development of the parts of the Bulamu Ventilator and the Biodegradable face shields in the efforts to combat COVID -19. He developed the solar powered irrigation pump, the Multipurpose Farmers' Tractor called MV Mulimi, and started the extraction of fuel from hard plastics and making insecticides from the eucalyptus and other agricultural waste among others. Prof. Banadda was favourably cited with thus far published research findings in over 240 peer-reviewed journal Scientific publications, with a record of 76,086 Reads and 1,201 Citations. He also (co)-supervised 12 PhD students to Completion and 31 M.Sc. students. At the time of his death, a number of PhD and Master students were under his supervision. Prof. Banadda has served in the following capacities: Member of Makerere University Council, Member of Makerere University Senate, Chairperson of Makerere University Contracts Committee.

At the time of his death, he was also serving in the capacity of: CHAIR, Department of Agricultural and Bio-Systems Engineering, School of Food Technology, Nutrition and Bio-engineering. He is survived by: WIFE (Dr. Beatrice Namaganda Banadda), and CHILDREN NAMELY: Daniel Mayombwe Banadda, David Lutaaya Banadda and Joy Deborah Nalutaaya Banadda. Prof. Banadda's legacy is clearly written on the walls. He was an astute education administrator, a great man of inestimable quality, a visionary and innovative leader, and a nation builder, who had touched the lives of many positively, as characterized by his honesty, sincerity, integrity, devotion, humility and selfless service to our University. In the words of the late great Nelson Mandela: "Death is something inevitable. When a man has done what he considers to be his duty to his people and his country, he can rest in peace." "What counts in life is not the mere fact that we have lived. It is what difference we have made to the lives of others that will determine the significance of the life we lead."

May Prof. Banadda's Soul Continue Resting in Peace!

MUARIK IN PICTORIAL









