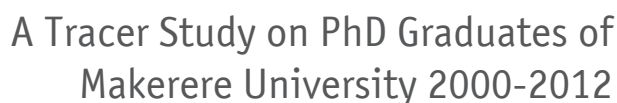




Becoming a Learner Centered Research Led University

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MAKERERE UNIVERSITY



Directorate of Quality Assurance

Becoming a Learner Centered
Research Led University

Mapping the careers and mobility of Makerere University Doctoral Graduates;2014

A Tracer Study on PhD Graduates of
Makerere University 2000-2012

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Abbreviations and Acronyms

NCHE	National Council for Higher Education;
CHET	Center for Higher Education Transformation;
NUFU	Norwegian Programme for Development, Research and Education
USAID	United States Aid for International Development;
Norad	Norwegian Agency for Development Cooperation
Nuffic	Netherlands organisation for international cooperation in higher education.
Sida	Swedish International Development Agency;
OECD	Organisation for Economic Cooperation and Development;
CDH	Careers of Doctorate Holders;
MUBS	Makerere University Business School;
COVAB	College of Veterinary Medicine, Animal Resources and Biosecurity;
CONAS	College of Natural Sciences;
COLAW	College of Law;
COEES	College of Education and External Studies;
COCIS	College of Computing and Information Sciences;
COBAMS	College of Business and Management Sciences;
CHUSS	College of Humanities and Natural Sciences;
CHS	College of Health Sciences;
CEDAT	College of Engineering, Design, Art and Technology;
CAES	College of Agricultural and Environmental Sciences;
UNCST	Uganda National Council for Science and Technology;
WHO	World Health Organisation;
UIRI	Uganda Industrial Research Institute;
UNBS	Uganda National Bureau of Statistics;
SME	Small and Medium Enterprises;
PALITA	Pearl of Africa Lifetime Achievement Award
NWSC	National Water and Sewerage Corporation;
KCCA	Kampala Capital City Authority.

Executive Summary

The tracer study on doctorates trained at Makerere University for the period 2000-2012 was conducted to determine their productivity, employability and mobility. This information was deemed necessary in assessing the impact of the intervention of research support programmes with specific focus on Sida support, which resonates through the doctoral voices, included in this report.

The OECD questionnaire developed for conducting surveys on Careers and Productivity of Holders of Doctorates (CDH) was adapted for this study. Additional information was obtained through one on one discussions with key informants that had been supported by the Sida program. Academic Records at Makerere University were the main source of names of respondents. The data was analyzed with standard tools.

The capacity to train and graduate students at doctoral level at Makerere University had greatly improved over the period 2000-2012. More than 300 doctorates had been awarded in the same period. Most of this capacity was ambient in the science disciplines. The demographic characteristics of the respondents revealed that the proportion of female doctorates was 23%. Almost all (97%) of the respondents were employed in fields related to their training. There is a major challenge in retaining the doctorates trained at Makerere University. A large proportion (92%) of the respondents indicated they would leave the country once an opportunity arose. Low salaries and benefits were the major demotivating factors.

The high cost of doctoral training has hampered effective demand for this training even though the demand for doctorates in the country is far from being satisfied. Most of the training was externally funded as a consequence. For instance according to the Makerere University Directorate of Research and Graduate Training, the collaboration with Sida had produced over 106 PhDs by end of 2013. External funding being a stopgap measure, presents the challenge to the University and Uganda to mobilize internal resources for sustainable growth in doctoral training. Funding is required for infrastructure, equipment, recruitment and retention of qualified staff.

The annual doctoral production rate for Uganda needs to be multiplied by 10 to reach the South African current rate. This could be scaled for a period of 10 years to reach 1000 doctorates per year by 2025. It is critical that the employers of these doctorates strive to pay emoluments that are fairly comparable to those paid to their colleagues within the region. There is need for funding that specifically targets female applicants for doctorate training. The University needs to mobilize external resources for training to supplement the internal resources in the medium term (next 10 years). The doctorate training costs cannot be fully raised nationally considering the low household incomes.

The supply for doctorates needs to be increased to meet the increasing demand for doctorates; emanating from the expanding higher education sector, increasing research institutions & statutory bodies and the emerging system of innovations. The country needs to systematically increase its annual doctorate production rate. Makerere University has latent potential (in terms of supervision) to produce over 200 doctorates per year; however, the track to graduation needs to be smoothened to improve the throughput.

The gender imbalance in the training should continue being addressed as to promote equitable participation of both men and women.

The tendency for doctorate holders to move to better economic zones may create despondency at the work place and lower productivity. This needs to be stymied to minimize brain drain.



Introduction

Makerere University has been in existence for over 90 years with a prime status of being the leading University in Uganda. In its Strategic Plan of 2007/08-2017/18 the University has committed to repositioning itself to meet emerging development challenges. One of the strategies identified in this commitment is that of being research-led in addition to being learner-centered and driven by Knowledge Transfer Partnerships & Networking.

Various benchmarks have been identified for the University's new focus of being research-led. Key of these include increasing the proportion of graduate students to at least 30% in the graduate mix; increasing the number students graduating with Doctorate each year to 10% of the Permanent Senior Academics; raising the proportion of Academic Staff with Doctorates to at least 50% of Permanent Academic Staff; raising the publication rate for Academic Staff to 0.5 or at least one peer reviewed article every two years.

The current data indicates that the University has started attaining some of the targets. The proportion of Academic Staff with Doctorates is about 67% of the Permanent Academic Staff. This is above the 60% required by the National Council for Higher Education (**NCHE**) the regional benchmark set by the Center for Higher Education Transformation (**CHET**). The proportion of graduate students in the student population is about 15% at institutional level. However, the College of Health Sciences has attained the 30% target for graduate students. The publication rate for the institution is still at 0.2. The Doctorate graduation numbers have reached a peak of 60, which is about 0.6% with a target of 100 per year. The current enrolment of Doctorate students is at 600. Since the duration of the Doctorate is 5 years, the University should be graduating 120 students per year with maximum efficiency.

The university has graduated over 300 Doctorates in the period 2000-2012 representing a tremendous progression from 23 Doctorates in the year 2000 to 61 Doctorates in 2012. This considerable improvement was heightened by the Sida intervention in building capacity for research and graduate training at the university. Other major contributions in research capacity building where from NUFU, Norad, USAID, European Union, IDRC, Nuffic, and the Carnegie Corporation of New York as well as the Government of Uganda.

Purpose and Objectives of the Study

In the current Sida supported Research Program at the University, one of the activities is to conduct a tracer study of the University's Doctorate graduates over the period of 2000-2012. The purpose of the tracer study is to map the careers and productivity of Makerere University Doctorate graduates. This information will be useful in assessing the impact of the intervention of research support programmes with specific focus on Sida support.

The following were the objectives of the study:

- a) Establish the number and demographic physiognomies of Makerere Doctorate graduates for the period 2000-2012;
- b) Profile the Research impact of Sida supported Doctorate graduates;
- c) Analyse the employment situation, career development, international job mobility, scientific output and experience linked to the prospective career paths of Makerere Doctorate graduates for the period 2000-2012;
- d) Establish Specific Characteristics of doctorate holders, such as gender, field of study, sources of financial support and year of completion.

Methodology

The OECD questionnaire developed for conducting surveys on Careers and Productivity of Holders of Doctorates (CDH) was adapted for this study. The respondents were contacted through their telephone and email contacts. Respondents completed the Questionnaire. Additional information was obtained through one on one discussions with key informants that had been supported by the Sida program.

The CDH survey questionnaire

The questionnaire is divided into seven different modules dealing with different aspects of the careers of doctorate holders like Employment situation and International mobility.

Data Presentation and Analysis

The data was analyzed in SPSS software as well as Microsoft Excel and presented in the format suggested in the OECD manual.

Data Sources

The main source of names of respondents was Academic Records of graduates of Makerere University in the Academic Registrar's Office as well as the Directorate of Research and Graduate Training at Makerere University. The target population was all Makerere University doctoral graduates for the period of 2000-2012.

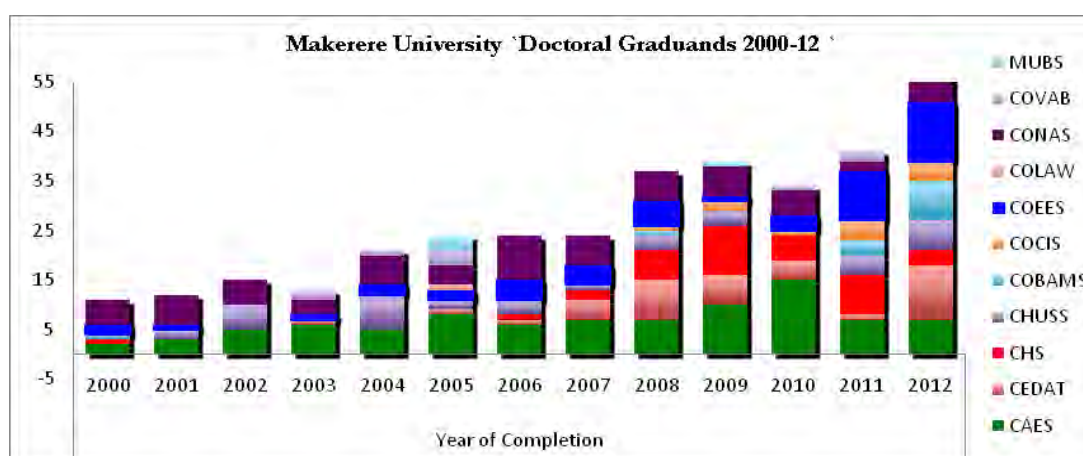
¹Auriol, L., M. Schaaper and B. Felix (2012), "Mapping Careers and Mobility of Doctorate Holders: Draft Guidelines, Model Questionnaire and Indicators – Third Edition", OECD Science, Technology and Industry Working Papers, 2012/07, OECD Publishing. <http://dx.doi.org/10.1787/5k4dnq2h4n5c-en>



Findings

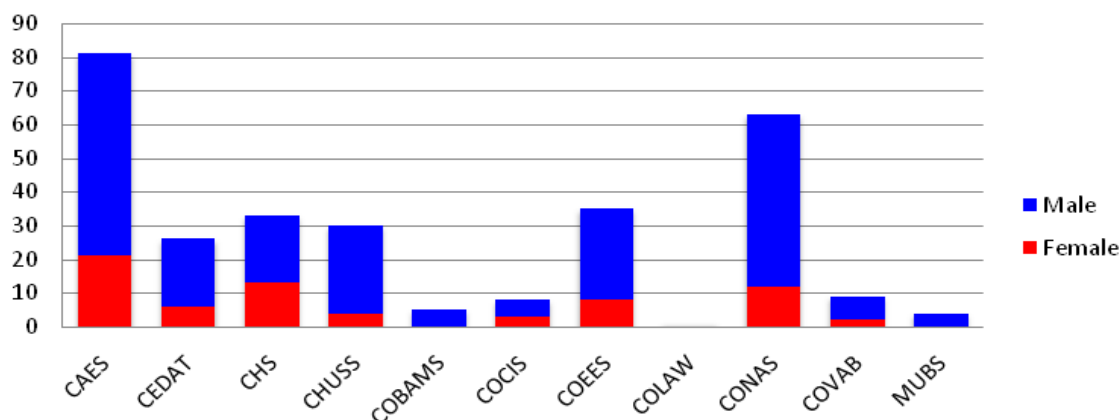
The Findings of the tracer study of Makerere University Doctorates during the period, 2000-2012 are presented in this section/chapter

Doctorate holders by sex and age class



The distribution of doctorate holders that graduated from Makerere University in the period 2000-2012 was skewed towards males. The majority of doctorate holders are in the age groups of 45-54 followed by the age group of 34-44. This phenomenon points to two possible causes; either the entry to this training is late or the stay in the training is long. The international average mode is 34-44 pointing to special causes associated with the training not only in Makerere but also in Uganda as a nation.

Doctoral Graduates by Gender and College



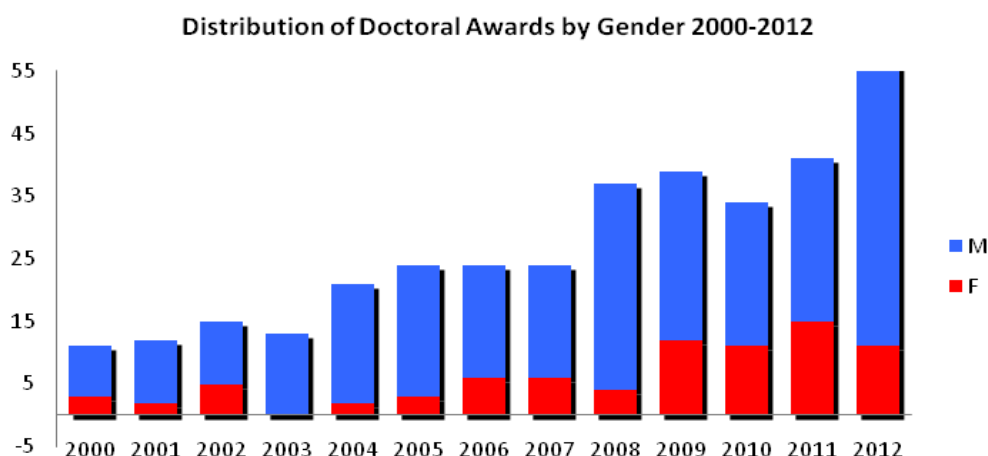
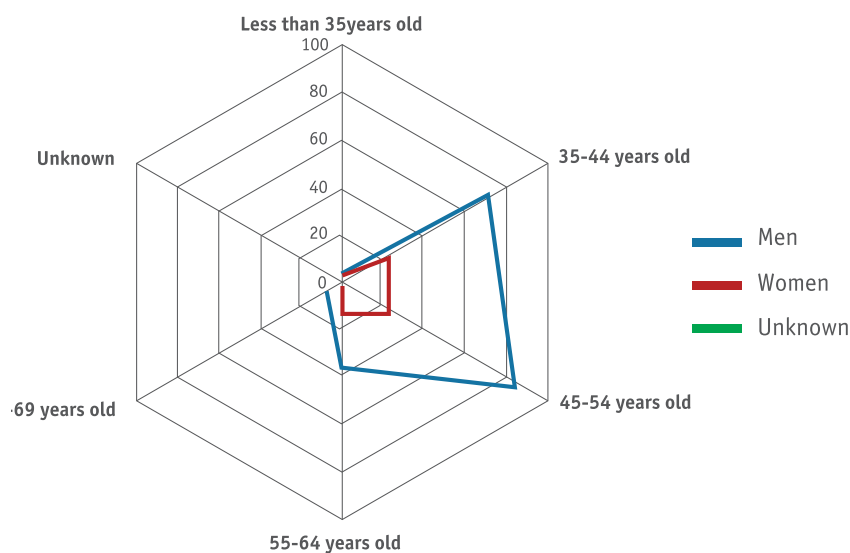


Figure 1: Doctorate holders by sex and age class



The age distribution of Makerere University doctorate holders is almost normal. Doctorate holders of 55 years or older account for smallest percentages in most countries; with the exception of Latvia and Hungary (Auriol, Schaaper & Felix, 2013). Within the population, there were few (3%) doctorate graduates below the age of 34 and above 65 years. The median age at graduation worldwide varied from 29 years in Belgium to 39 years in Czech Republic in 2005 (Auriol, 2010).

Even though late entry and overstay are evidenced in the institution, these are in turn largely caused by financial hardships faced by students and leading to clock ins and clock outs. The average stay on the doctoral programs at Makerere University is reported to be 6.5 academic years by the Center for Higher Education Transformation (CHET, 2007). The official policy at the institutions puts the maximum duration to 5 years for research-based doctorates.

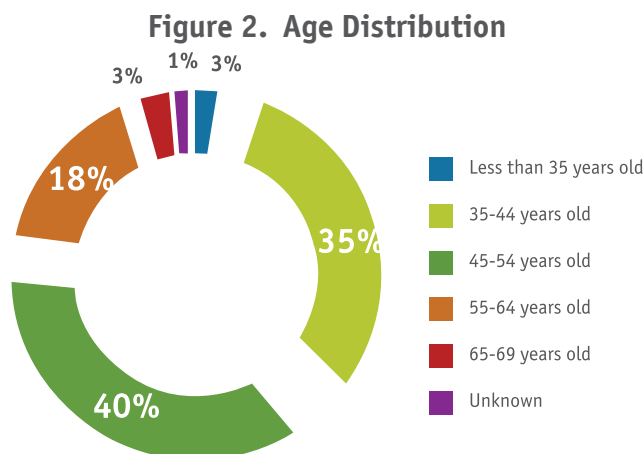


Table 1: Doctoral Holders by Sex and Country of Citizenship

Doctorate holders by Country of citizenship

The majority (98%) of Makerere University doctorate holders are Ugandans by birth but distantly followed by permanent residents.

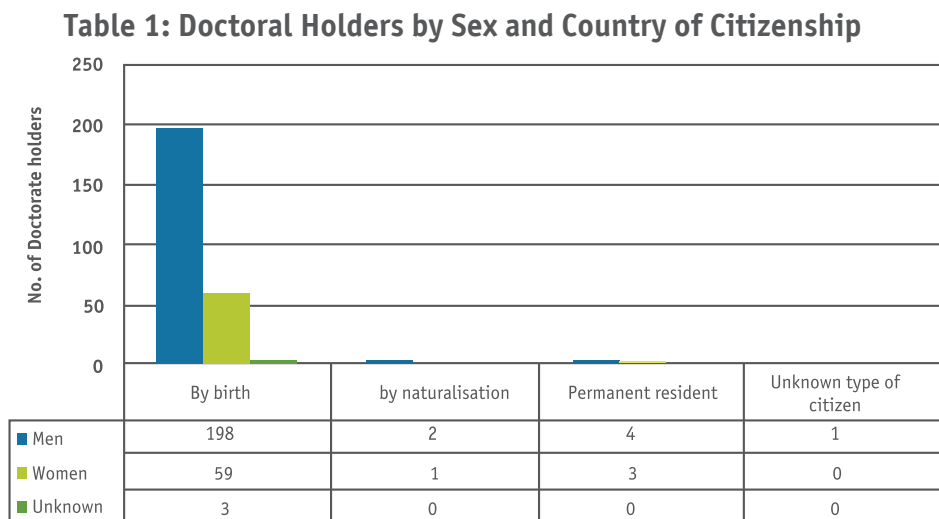
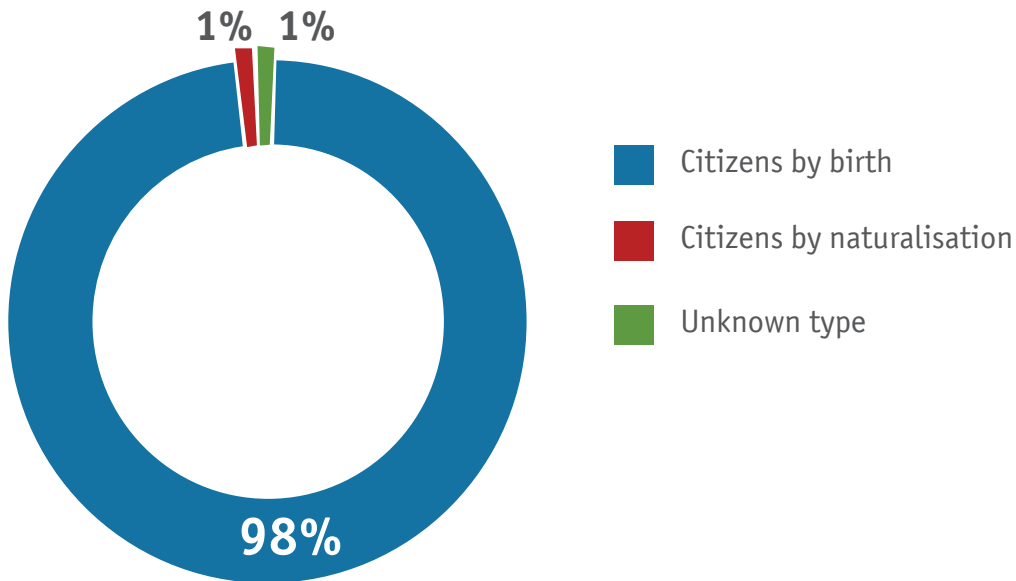


Figure 3: Doctorate holders by type of citizenship/residence status and place of birth



Doctorate holders by citizenship/residence status and age class

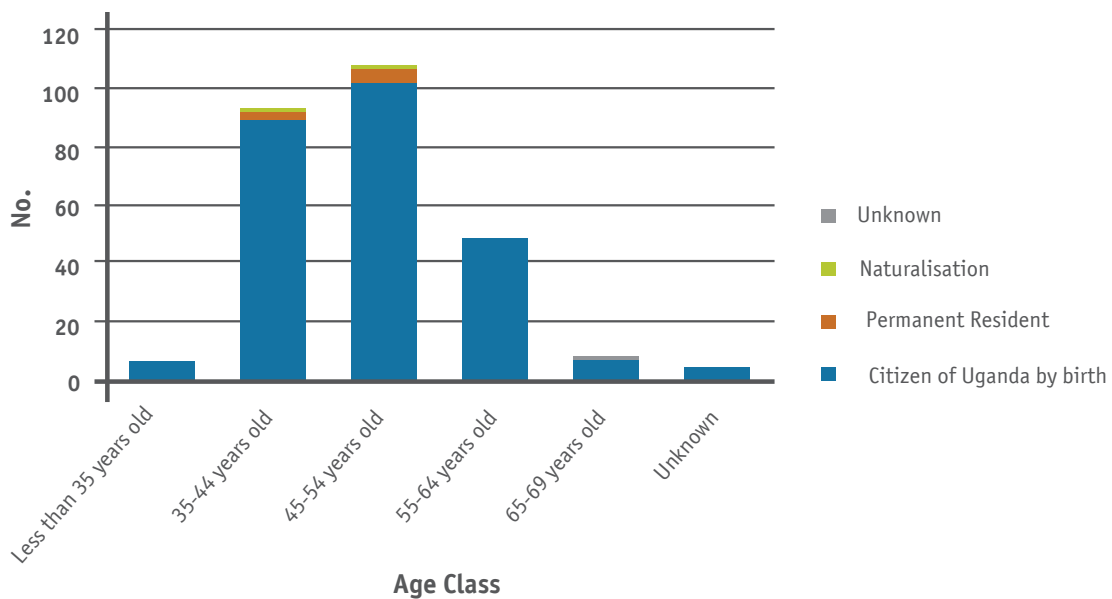
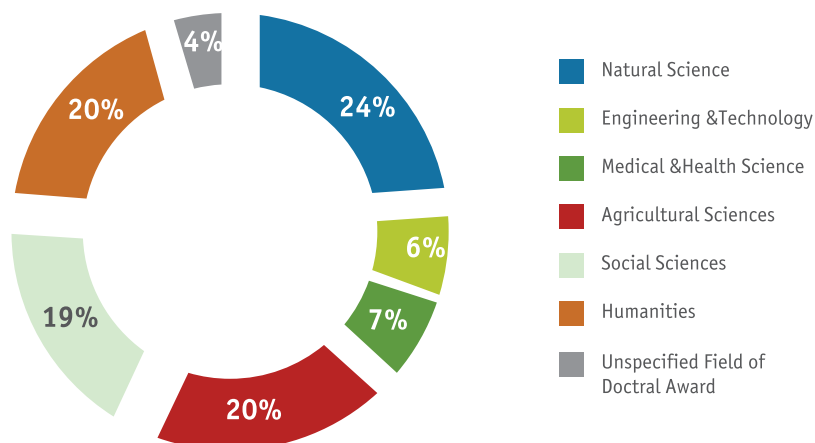


Figure 4: Doctorate holders by field of award

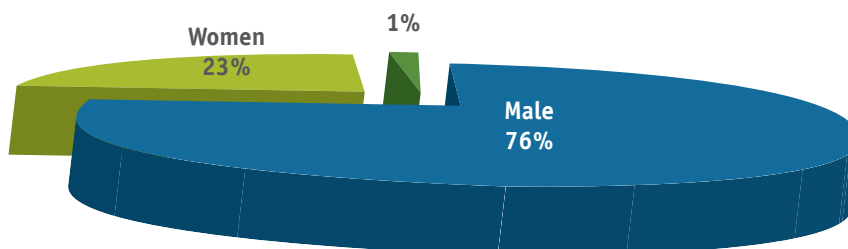


Makerere University doctorate holders are mainly in natural sciences (24%), agricultural sciences (20%) and humanities (20%).

Doctorate holders by Gender

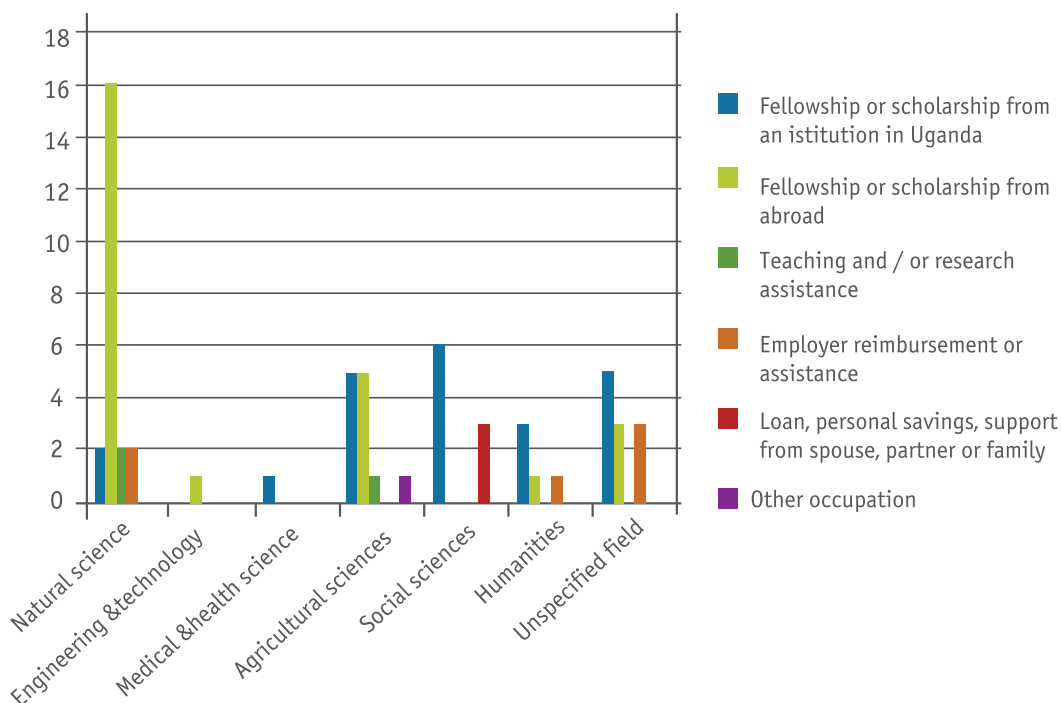
Makerere University doctorate holders were mainly male (76%) compared to female (23%). In most countries, male doctorate holders exceed 60% of the total number doctorate holders. The gender disparity is therefore very wide and requires deliberate strategies to reduce it though similar to the global trend. Latvia is actually the only country in the World that women have the largest share of doctorates or research qualifications (Auriol et al, 2012).

Figure 5: Gender Disparity



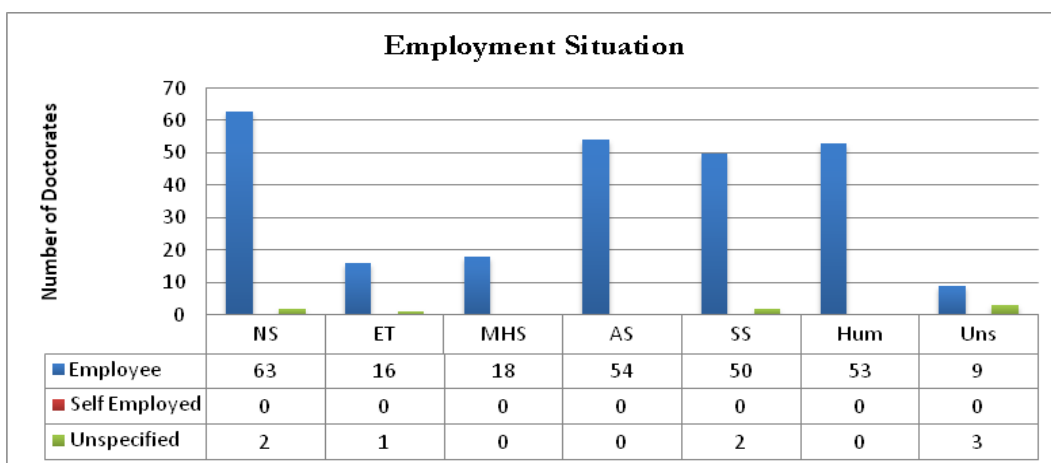
Funding Sources

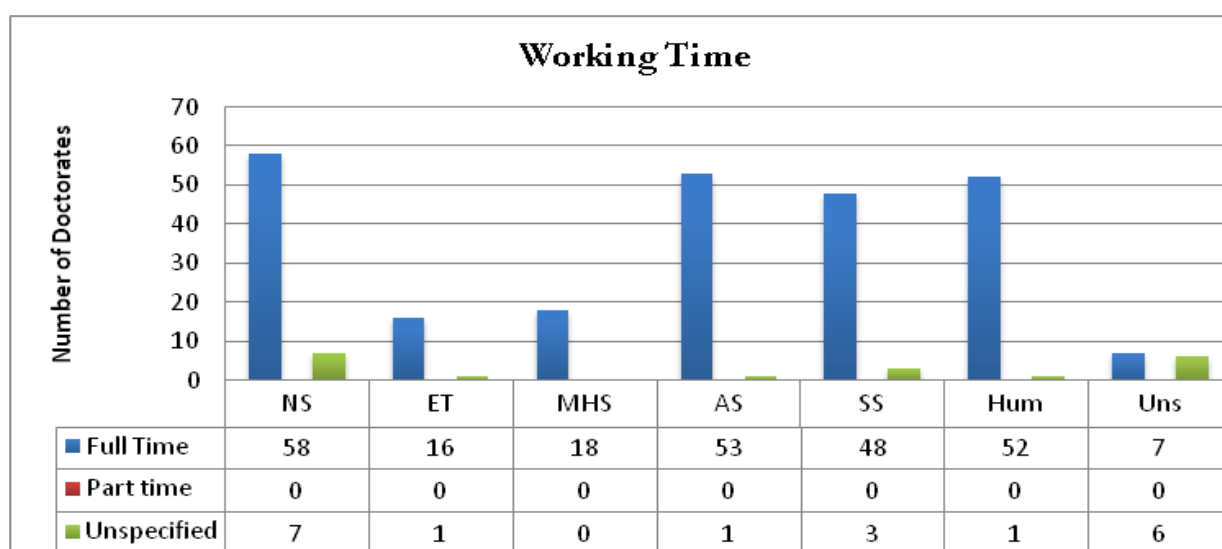
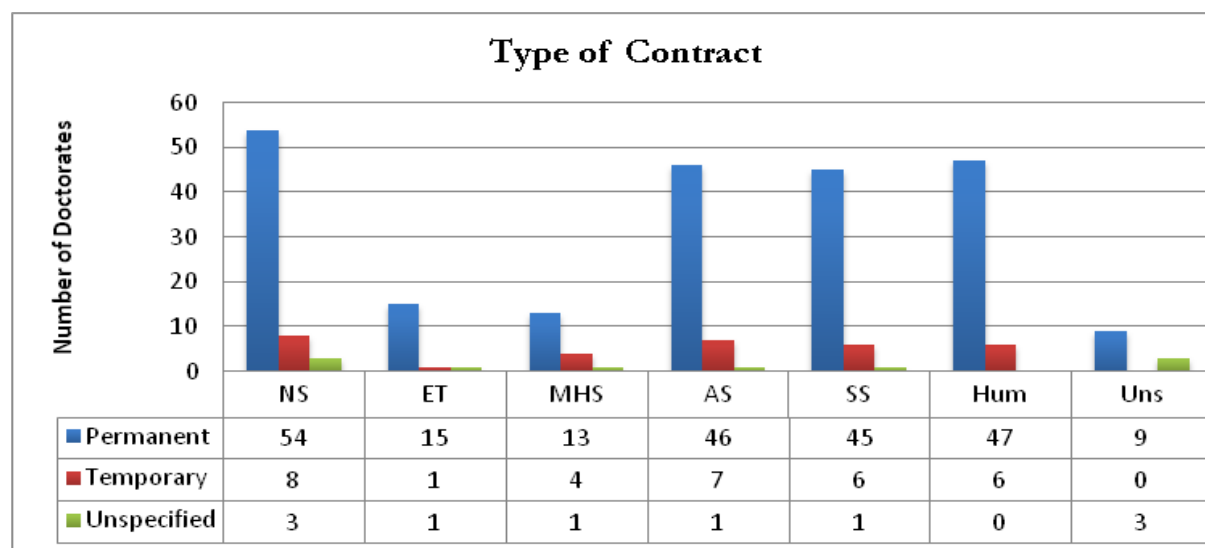
The sources of funding for doctoral training were fellowships (internal and external), research assistantships and personal sources. The Natural Sciences and Agricultural Sciences were major beneficiaries of fellowships from abroad.

Table 2. Doctorate holders by main field funding source


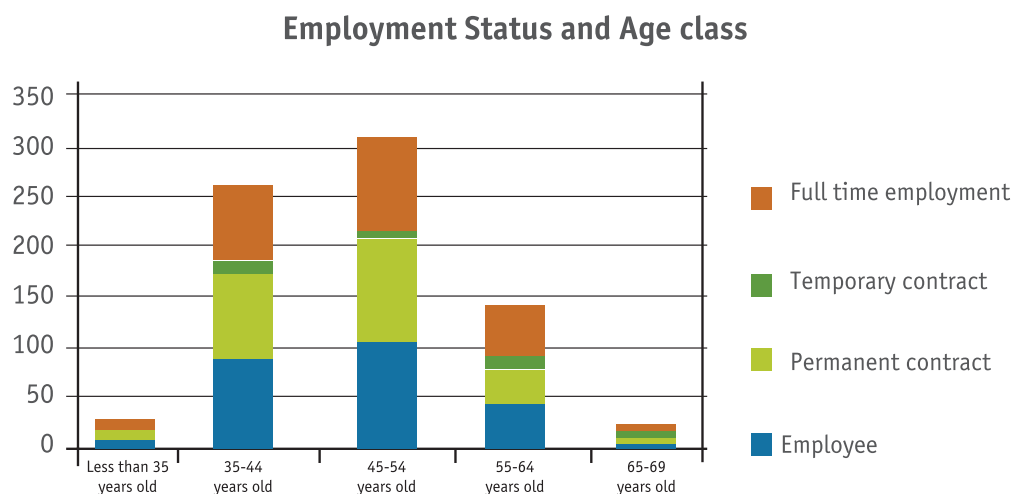
Employment Status and Field of Doctorate Degree

The majority (97%) of the doctorate holders were employed. Among those that disclosed their employment status, none was self-employed. Among the respondents, 85% had permanent contracts; and 95% of the respondents were employed on full time basis.





Key	
Natural Sciences	NS
Engineering and Technology	ET
Medical and Health Sciences	MHS
Agricultural Sciences	AS
Social Sciences	SS
Humanities	Hum
Unspecified	Uns

Figure 6: Employment Status and Age Class of Doctorates

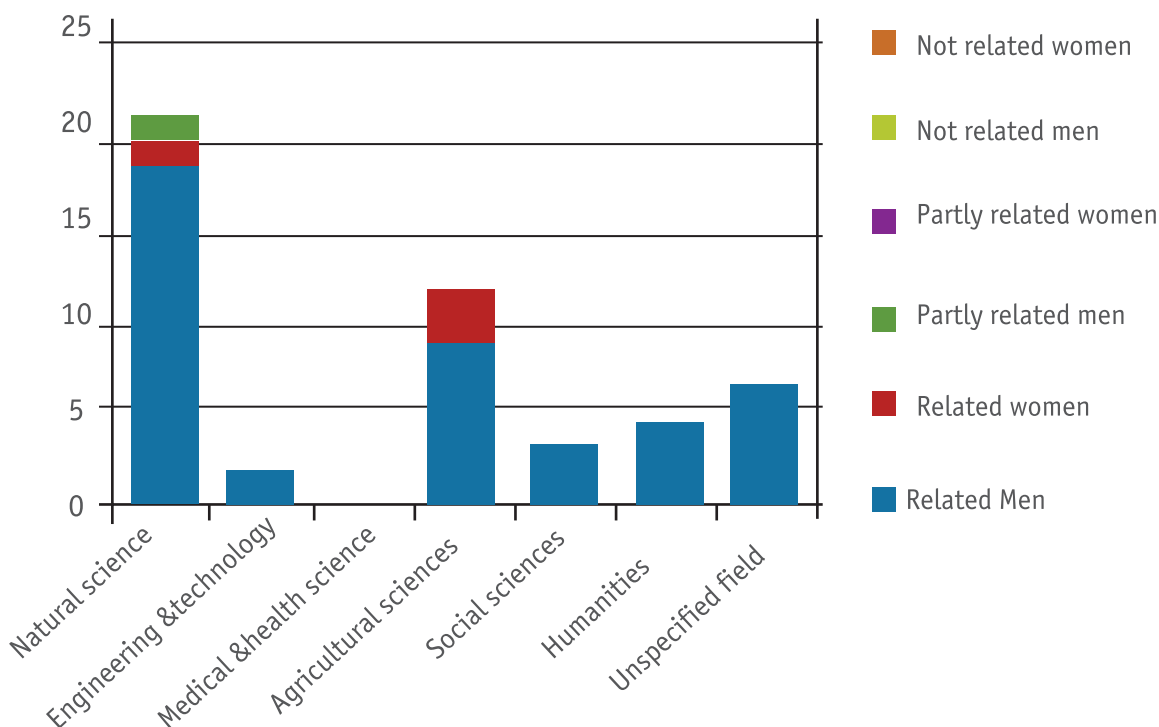
There were proportionately more respondents on contract terms in the ages above 54. This is in consonance with Uganda Government policy on retirement of civil servants and other public officers; these are required to retire after 60 years of age. Most universities and research institutions in Uganda award discretionary contracts to their employees after the retirement age.

Mobility of Makerere University Doctorate holders

Intentions to Move	Number
Intentions to move out of Uganda	252
Intended Destination	Number
Ethiopia	1
Kenya	6
Korea	1
Netherlands	1
Norway	1
South Africa	3
South Sudan	1
Tanzania	2
USA	3

Most respondents (252) had intentions of moving out of Uganda; only 19 indicated the specific destination countries.

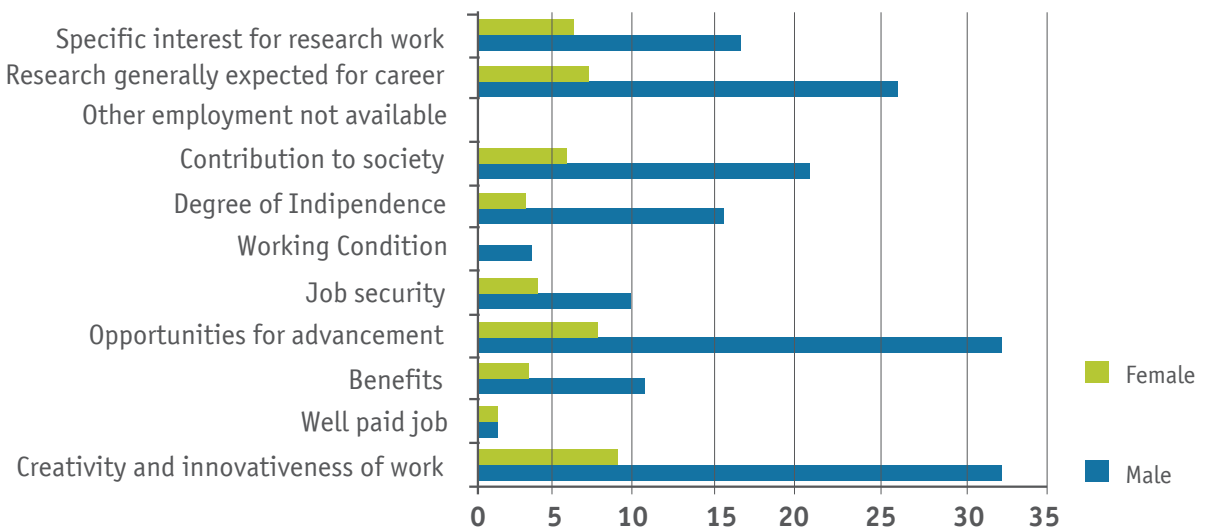
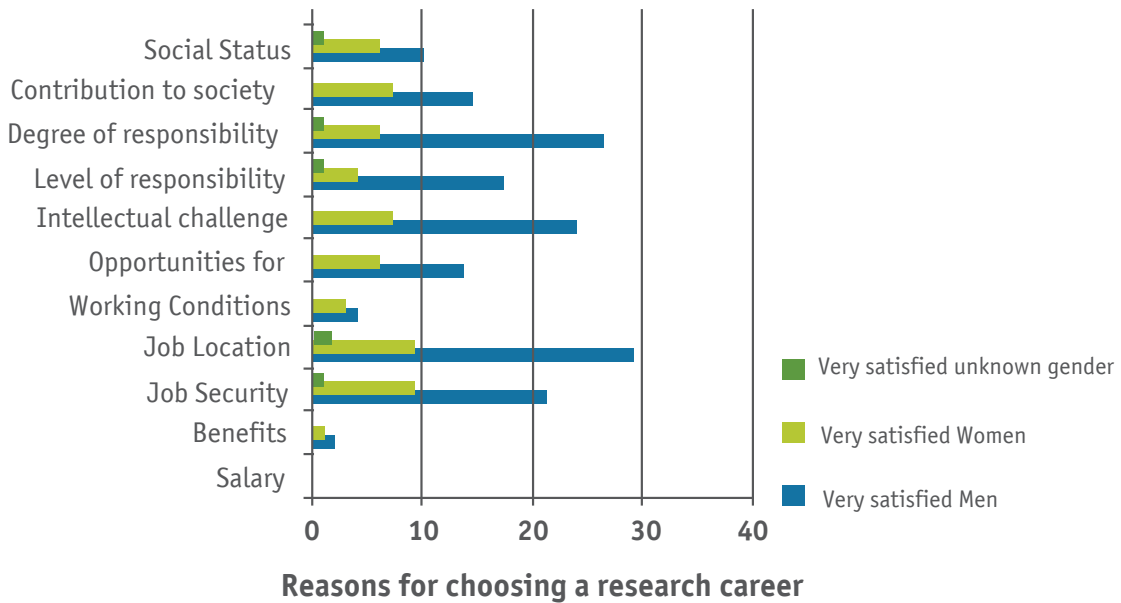
Perception regarding the jobs and Qualifications by Gender



Most respondents said that they were employed in the domain of their training. At the university and research institutions the recruitment process as well as the staff development programs ensure proper alignment between qualifications and jobs.

Job Satisfaction

The most motivating factors at the jobs of the respondents were *being intellectually challenged* and the geographical location of the job. Low salaries and benefits were the biggest sources of displeasure; this was the case for male and female respondents alike. The female respondents were relatively more driven by social status and contribution to society.



Reasons for Choosing a Research Career

Opportunities for advancement as well as creativity and innovativeness at work were the major reasons cited by respondents for selecting a research career. These two reasons point to direct incentives of career growth and commercialization of university research tagged to industrial linkages.

The Doctorate Voices



William



Julius



Joshua



Joseph



Noeline



Lilian



Fatuma



Assumpta



Henry



Micheal



Charles



Frank



Peter



Christopher



John Baptist

A Substantive Principal of a College

Dr. Henry Alinaitwe

Email Contact: alinaitwe_h@cedat.mak.ac.ug;

Doctorate Studies: Lund University, Sweden and Makerere University 2004 -2008;

Doctorate Research Area: Construction Management;

Title of Doctorate research: 'Improvement of Labour Performance and Productivity in Uganda's Construction Industry.'

"The key finding of my doctoral work was that Construction Workers spend about 40% of their time on productive activities and only 20% of their time on making the building grow. The other percentage is wasted in non-productive activities, many unrelated to the work at hand. I have shared these findings with the Kampala City authorities, Engineers, Architects and Contractors. I am positive it has informed many of their decisions," says Henry Alinaitwe.

He speaks authoritatively, befitting his current title as Principal at the College of Engineering, Design, Art and Technology (CEDAT). Dr. Alinaitwe is grateful for the SIDA support, which was instrumental in getting him thus far. "The SIDA funding has helped me move up quickly, for example through publishing articles – a key requirement for academic growth. I have risen through the ranks from a Junior Lecturer to an Associate Professor and Principal now and I am grateful to SIDA," he adds. He has previously served as in-charge of examinations, Deputy Dean at the Former Faculty of Technology,



Dean and Deputy Principal at CEDAT.

In a way to infuse some of his findings into curriculum, he proposed the introduction of a Masters of Sciences in Construction Management at CEDAT in 2013. The course has since picked up with over 30 enrolled students. The will help improve performance and reduce non-productive work at construction sites hence increasing construction productivity.

Supervision

He is currently supervising:

- 3 Doctorate students in the area of Construction Management;
- 10 MSc students in the area of Civil Engineering and Construction.

Awards and Recognitions

- Recognized as the most dedicated Lecturer, 2008, Faculty of Technology- Makerere University;
- Founder Member of the Construction Management Association of Uganda;
- Certificate for contributing to the development of Construction Managers.

Membership to Professional Organisations

- Registered Engineer (Engineers Registration Board Uganda Cap. 271); Uganda Institute of Professional Engineers;
- Construction Management Association of Uganda;
- Member of the Editorial Board of Institution of Civil Engineers Journal – UK;
- Member of the Editorial Board: Journal of the Built Environment Research.

Outreach services

- Board Member, Mulago Hospital
- Member of the University Contracts Committee, Makerere University

Uganda's First Female PhD in Architecture

Dr. Assumpta Nnaggenda-Musana

Email Contact: nagendaa@gmail.com;

Doctorate Studies: KTH, Royal Institute of Technology, School of Architecture and the Built Environment, Stockholm 2005 -2008.

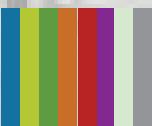
Doctorate Research Area: Urban Planning and the Environment

Title of Doctorate research: "Housing Clusters for Densification within an Upgrading Strategy. The Case of Kampala, Uganda."

Dr. Assumpta Nnaggenda-Musana was the first female Architect to hold a doctorate in Uganda in 2008. Since then, her world has changed for the better. She is currently a Lecturer in Architecture and Physical Planning at CEDAT, and also serves on several Government technical task committees and professional boards in the areas of Architecture and Urban Planning. One of these is the Presidential Initiative for Banana Industrial Development, PIBID, where she has chaired the Master Planning Committee.

"Architecture is a male-dominated field and many people think it is complicated. My experience has proved to me that it is not that complex. It calls for commitment, just like many other professions. I advise ladies who want to pursue Doctorates in this field or any other field, to do so as soon as possible especially if they intend to start or have already started families," she says.

For her Doctorate, Dr. Nnaggenda-Musana looked at Uganda's informal settlements. "I studied how informal settlements develop on private and public land in Kampala. This included examining houses in the informal settlements and finding out ways in which appropriate housing can be provided for the urban poor. My research recommends regularisation of informal settlement and low-rise vertical construction of houses as opposed to horizontal spread out," she explains. As a result of her Doctorate, Nnaggenda-Musana feels she now teaches students in a better manner, for she is more informed and aware of the vast research accomplished in her field.



Innovations

Dr. Naggenda-Musana with a team of five others, are proposing to construct a mobile toilet for informal settlement. The premise is that due to the lack of appropriate road networks in the informal settlements it can be difficult for cess-pool trucks to access pit latrines in such places, in order to empty them. Mobile toilets would allow the users to empty the toilets on self-help basis. The research is still at concept level. (<http://www.newvision.co.ug/news/633103-makerere-designs-metallic-mobile-public-toilet.html>)



The smart portable trailer toilet will be constructed using metallic materials and will cater for the needs of disabled people. It will utilize solar energy in the functioning. Target deployment areas include suburbs with high water tables that make it difficult to construct pit latrines.

Supervision

She is currently supervising

- One Doctorate student in the area of Gender Sensitive Architectural Designs;
- Three Masters students researching on informal settlements.

Membership to Professional Organizations

- Member, Uganda Society of Architects;
- Member Architects Registration Board.

Outreach services

- Member, National Habitat III Committee;
- Board Member, Nsambya Hospital;
- Technical Adviser, National Planning Authority;
- Member, Board of Directors, Technology Consults Ltd.

Exposing the dangers of Co-trimoxazole

Dr. William Buwembo

Email Contact: wbuwembo@yahoo.com;

Doctorate Studies: Makerere University and Uppsala University in Sweden 2009 -2012;

Title of Doctorate research: 'Viridans Streptococci Group: Antibiotic susceptibility profiles, cotrimoxazole prophylaxis and the molecular basis of cotrimoxazole resistance in Uganda'

"One of the drivers for this work is that there is overuse of *Co-trimoxazole*, a drug we studied to see what its overuse has done to the community. Although it is not the drug of choice in dental practice in this country, it is frequently being used," says Buwembo. He broke new ground in the discovery of adverse effects of the overuse of *Co-trimoxazole* in his doctorate research.

He explains that although this drug is recommended for daily use amongst HIV/AIDS patients, to lessen incidents of attacks of several ailments including diarrhea, coughs and malaria, it ends up killing useful flora in the body as well.

"It has been effective in reducing the occurrence of these other ailments. But in the process of doing this, the drug kills normal flora like *Streptococcus mutans* and *Viridians streptococcus*," he explains. "It then leaves behind disease causing bacteria like *Streptococcus pneumoniae* which are not susceptible to the drug. In the study we conducted, HIV patients who take Co-trimoxazole daily showed more resistance in normal flora to



the drug, compared to those who were not taking it” he adds.

His research discovered 45 new sequences in the alignment of genes showing resistance markers (<https://www.pubmed.com/nuccore/?term=Buwembo>). Dr. Buwembo nonetheless concedes that the time is not ripe to show that Co-trimoxazole is causing adverse effects especially since the other benefits of using the drug still hold. “It is difficult to get a policy to stop the usage of this drug because it is cheap and we do not have an alternative good enough to stop occurrence of other ailments in HIV patients yet,” he says.

Doctorate Research Area

Dr. Buwembo focused on determining the extent and the methods by which bacteria normally present in our mouths and throats are able to prevent drugs from killing them. These bacteria are usually harmless but occasionally cause life-threatening diseases and drugs are needed to kill them. He found that these bacteria have developed high abilities to prevent commonly used drugs from killing them and that they share these abilities with disease causing bacteria. The common practice of Co-trimoxazole prophylaxis in HIV patients led to a significant increase in bacteria causing tooth decay with these abilities. This development may make commonly used drugs ineffective, and calls for alternative drugs and continued surveillance of the bacterial



abilities to withstand our drugs.

Supervision

He is currently supervising 3 M.Sc students in the area of Human Anatomy

Membership to Professional Organisations

- Member of the International Association of Dental Research (I.A.D.R) East African Division;
- Member of the Uganda Medical Association (U.M.A.);
- Member of the Uganda Dental Association (U.D.A.);
- Member of the Society for General Microbiology;
- Member of the American Society of Tropical Medicine and Hygiene.



Ethical Science

Dr. Julius Ecuru

Email Contact: julius.ecuru@gmail.com;

Doctorate Studies: Blekinge Institute of Technology, Sweden and Makerere University 2010 -2013;

Doctorate Research Area: Innovation Systems and Development

Title of Doctorate research: 'Unlocking Potentials of Innovation Systems in Low Resource Settings'.

Dr. Julius Ecuru is an Assistant Executive Secretary at Uganda National Council for Science and Technology (UNCST). He is one of the leading scientists and scholar at UNCST. He has been on a number of research committees/teams both at the national and international levels. He was one of the experts selected to serve on the International Research Panel of President Barack Obama's Presidential Commission for the Study of Bio-ethical Issues (PCSB) in 2011.



"President Obama directed the Commission Chair to set up an International Research Panel to consider current U.S. Government regulations and international standards that guard the health and well-being of participants in scientific studies supported by the U.S. Government, and specifically to be assured that 'the current rules for research participants protect people from harm or unethical treatment, domestically as well as internationally'. The President was interested in guarding against a recurrence of the 1946 – 1948 Guatemala unethical studies in which hundreds of soldiers, prison inmates and psychiatric patients were deliberately infected with syphilis and other sexually transmitted diseases without their consent to study effectiveness of penicillin. This injustice was done by American Public Health Service and Guatemalan doctors in their study of penicillin," he explains.

The Panel of 14 members had only two Panelists from Africa; Dr. Ecuru from Uganda and Prof Adel Mahmoud from Egypt. The subsequent report of the Commission entitled 'Moral Science: Protecting Participants in Human Subjects Research,' is available online at www.bioethics.gov. The

report recommended, among other things, more accountability in research, trainings on research and research ethics especially for developing countries, more community engagement from inception to research output, and compensation to victims of research-gone-wrong. Dr. Ecuru has since participated in developing the WHO operational standards on research ethics and other local and international research entities.

At UNCST, Dr. Ecuru is responsible for research and technology management, which includes human, social and environmental safeguards in research, innovation management, and institutional development matters. “We facilitate the conduct of all kinds of research from engineering, agriculture, life sciences to humanities and social sciences. UNCST now registers close to 700 new research projects annually in all fields of science and technology, up from around 100 in 1990. We also advise on intellectual property management issues, and translation of research products to innovations in the market place. Occasionally we provide grants for people to do research and technology development. My Doctorate feeds into my work here and it has added much value to my work and our team. I am grateful for SIDA’s sponsorship of my research.” he adds.

The key finding

Innovation systems, particularly in the biosciences, are evolving in Uganda. They need to be supported by clear policies with goals and incentives that spur innovation. The university is emerging as a key actor, as demonstrated by the growing number of university-driven entrepreneurial initiatives. This presents a an opportunity for greater interaction and learning among actors (especially with private sector), and to position the university as the centre for research and innovation.

Membership to Professional Organisations

- Member, Uganda Society for Health Scientists
- Member, Bio-Resources Innovations Network for East African Development
- Member, Applied Research Ethics National Association
- Member, Uganda Society for Professional Chemists



Taking Professionalism to the Informal Sector

Dr. Joshua Mutambi

In Email Contact: jmutambi@yahoo.com

Doctorate Study: Blekinge Institute of Technology, Sweden and Makerere University
2009 -2013,

Title of Doctorate research: 'Stimulating Industrial Development in Uganda through Open Innovation Business Incubators.'

Mutambi is the Ag. Commissioner, Industry and Technology Department; Ministry of Trade, Industry and Cooperatives. He is a bag of innovations targeting Uganda's burgeoning informal sector. Below are some of his highly impactful innovations designed for the informal sector:

One Village One Product (OVOP) Programme

In 2010, Dr. Mutambi initiated this programme which involves a village/region specializing in the production of a particular product for which it has comparative advantage. It aims at adding value to available raw materials, skills and human resource development. This programme was first piloted in Bushenyi District, Masaka and Serere districts but has since spread to many more districts including Mpigi, Kisoro, Kayunga, Kumi, Kamwenge, Bukomansimbi, Kalungu, Bududa, Kitgum, and Lira. This Programme



has been adopted in the National Development Plan, with an annual budget of 300m Uganda Shillings to roll it out countrywide.

Clustering Programme to nurture and incubate business in urban and rural areas of Uganda. It works on the concept of identifying individuals/companies dealing in a common and related activities/projects and equipping them with the requisite skills. The programme has successfully been implemented in Luweero District to support basketry, Jinja for bi-fuels and Katwe Metal Fabricators Cluster in Kampala.

“In Katwe, we had a number of juakalis (artisans), who needed assistance. They learn on the job. As a Ministry, we worked with Nakawa Vocational Training Institute, Uganda Industrial Research Institute (UIRI), Uganda National Bureau of Standards (UNBS) and other organizations to equip them with basic skills of the trade and technical development. They were also allocated land along Salaama road and need more support in developing it. The Cluster has close to 3,500 members. A visit to Katwe reveals high levels of excitement as some of the beneficiaries eagerly show Dr. Mutambi the latest metal works they have collectively developed. In fact one of them, Moses Semulimi, tells Dr. Mutambi that he is now a Professional and would like to be registered with a professional organization.



Doctorate Research Area

Dr. Joshua Mutambi's research focused on stimulation and increase of innovation processes and industrialization in Uganda through business incubators. Small and Medium Enterprises (SME), being the engine of growth and industrialization worldwide, understanding and designing how they can be supported better and nurtured for growth was key for the research. Innovation performance measurement, managing business incubators and other support mechanisms to SMEs were addressed. An open innovation incubator management model to guide incubation system in Uganda and other developing countries was designed based on cluster initiatives and innovation systems approach.



Policy briefs

- OVOP policy brief disseminated to the Ministry of Trade, Industry and Cooperatives; and Hon. Members of Parliament.
- Role of Small and Medium sized enterprises in Economic Development: Contribution from Ministry of Trade, Industry and Cooperatives.
- The Status of Science, Technology and Innovation Indicators in Uganda, part of the African Science, Technology and Innovation Indicators (ASTII) program under the New Partnership for Africa's Development (NEPAD)

Awards and Recognitions

- Certificate of Recognition awarded by Ministry of Trade, Industry and Cooperatives for contributing towards the development of the National Standards and Quality Policy on behalf of the Ministry and Government of Uganda, September 2012

- Certificate of Merit on performance by the Ministry of Tourism, Trade and Industry in Recognition of the Good Service rendered to the Ministry as Principal Industrial Officer, Dec. 2008.

Membership to Professional Organizations and Advisory Boards

- Member of the Project Management Research Committee of China (PMRCC), and the International Project Management Association (IPMA)
- Member of TCI (The Competitiveness Institute), the Global Practitioners network for competitiveness, clusters and innovation.
- Registered Member of Microfinance Gateway for World Bank Certified Trainers (2010)-Platform for Consultancy and Networking
- Technical Adviser to the Leather Products and Manufacturing Association in respect to the COMESA and Leather Products Institute.
- Board Member: Uganda Business and Technical Examinations Board, under the Education and Sports Ministry.
- Member of the Steering Committee of the Innovation Systems and Clusters Programme, Makerere University
- Registered Corporate Member of the Uganda Institution of Professional Engineers-UIPE
- Former Member: Governing Council of Management Training and Advisory Centre, Nakawa.
- Chairman Governing Council of Uganda Technical College - Bushenyi.





“I know how to make paper glossy using Kaolin”

Dr. John Baptist Kirabira

Email Contact: jbkirabira@cedat.mak.ac.ug

Doctorate Studies: Royal Institute of Technology, KTH, Sweden, 2001 – 2005.

Doctorate Research Area: Materials Science and Engineering

Title of Doctorate research: ‘Properties of Ugandan Mineral and Fire Clay Refractories’

For so many years, alternative uses of Mutaka kaolin, a vital industrial mineral in Uganda, remained unknown until an inquisitive Scientist, J.B. Kirabira made a ground-breaking discovery of its properties. This mineral, with a large deposit in Mutaka – Bushenyi district Uganda has for while been used in the ceramics and cement industries, but Dr. Kirabira’s discovery extends its application to the paper industry where it can be used in paper filling and coating.

“Paper comes from woody fiber and has to be smoothened or filled for an even finish. I discovered that the properties in Kaolin, which is white in colour, can be used in the filling of paper. Uganda’s kaolin actually has extraordinary properties compared to the internationally marketed ones and can also be used to make glossy paper,” he explains. “I broke new ground in this area,” he adds.

His discovery has since attracted the interest of a top paper manufacturing industry and product developers, like Inventia, based in Stockholm, Sweden which visited the kaolin deposit in Bushenyi District. Nonetheless, he continues the search for more investment opportunities to exploit the vast mineral.

“I feel good that what I did is practical. It will add value to Uganda’s industrial minerals and it has enhanced my research capabilities too. Some of the students I supervise are interested in the extraction of salt, iron, steel, pulp and paper using non-traditional materials like grass and sugar cane leaves,” he says.

Policy briefs

Following several discussion with Uganda’s Ministry of Energy and Mineral Development, and with Uganda Investment authority, Dr. Kirabira is looking forward to putting together a policy brief on the use and properties of kaolin.



Supervision

- Six PhD students whose research is in the area of Materials Science and Engineering working on Steel, Salt, pulp and paper.
- Supervised over 10 MSc students to completion. Their areas of research were energy management, salt extraction, renewable energy systems, product standards development, etc.

Awards and Recognitions

- PALITA Award 2013 in recognition of contribution to research, education and engineering

Membership to Professional Organisations

- Member: Uganda Institution of Professional Engineers, UIPE
- Vice President Uganda Institution of Professional Engineers, 2007 -2011
- Registered Member of the Engineers Registration Board, ERB
- Member of the Uganda Cleaner Production Center, UCPC

Outreach services

- Development of regional Industrial Parks
- SMEs product and business development services
- Council Member, Uganda Petroleum Institute Kigumba, UPIK

Passionate about customer satisfaction at NWSC

Dr. Frank Kizito

Email Contact: frank.kizito@nWSC.co.ug

Doctorate Studies: KTH, Royal Institute of Technology - Sweden, 2004 -2010

Doctorate Research Area: Development of water resources engineering and management decision support systems

Title of Doctorate research: 'Water Supply Management in an Urban Utility: A Prototype Decision Support Framework

Dr. Frank Kizito is the Senior Manager Decision Support Systems at National Water and Sewerage Corporation (NWSC), an institution he has been employed at for the last 20 years. His workplace was his Doctorate study area.

"My Doctorate research, which was of an action research nature, focused on using geo-visual tools to support decision making. I set up a number of tools that enable NWSC to capture



location of customers and link to available records in the billing and Call Centre databases. This information then gets displayed visually,” he explains.

By doing this, NWSC makes informed decisions, which translate into higher customer satisfaction. Dr. Kizito’s Doctorate research led to the creation of the Department of Decision Support Systems at NWSC. This Department is responsible for managing the customer geospatial database. “What I added was the integration of real-time spatial analytical tools to the operational data. This helps identify whether particular types of customer complaints are coming from a specific area and whether the solution needs a major decision like overhauling of water pipes,” he adds.



Membership to Professional Organisations

- Member, Uganda Institute of Professional Engineers

“I am almost too powerful. I am helping to create brown Architects.”

Dr. Lilian Namugany

Email Contact: namugany@yahoo.com

Doctorate Studies: Kungliga Tekniska högskolan
(Kth) Stockholm, Sweden, 2005 – 2011

Doctorate research Area: Place and place

Title of Doctorate research: “Spatial Experience and Meaning of Place in Kampala City:
Narratives of Personal Experience”

Dr. Lilian Namugany laughs heartily and wipes tears of joy as she narrates how touched she was to learn that one of her students named his daughter after her. “I met him in a supermarket with his wife and infant daughter called Lilian. He explained that I had impacted his life so much that he named his first daughter Lilian, as a reward to me,” she smiles broadly as she reaches out for a pack of tissue to wipe her watery eyes again. You can tell that she has unsuccessfully fought back the tears!!

Dr. Lilian Namugany lectures Architecture and Physical Planning at Makerere University, in the College of Engineering, Design, Art and Technology (CEDAT). She conducted her Doctorate research in the area of Place and Space. “My research area relates to how people really experience the city as opposed to the measurable city space; a perspective that Architects and Planners all too often take,” she says.



Namuganyi's research area comes at a time when Kampala City is undergoing major transformations, many of which have necessitated demolishing settlements and small businesses in the city and its outskirts. This move by the Kampala Capital City Authority has caused a wave of violent protests in the city, some of which have necessitated the intervention of anti-riot Police. "We researchers are not consulted by authorities before they make certain decisions. City Planners have paid attention only to the function of the city, with less consideration for the practice of the city. Consequently, a whole generation of upcoming businesses and small kiosks that cannot be allowed to operate in the city, have had to be demolished," she says. "But



these are the future industries. The authorities are wiping away a potential economy in favour of flower pots and water fountains," she adds.

According to Dr. Namuganyi, developments can happen without suffocating the common man. Namuganyi is now making proper use of the best weapon at her disposal, the students she lectures, to hopefully change the future trend. "I believe I have a lot of power simply by having these students, you cannot imagine how much. They will go out and do things in a better way. I have planted the seed. I feel almost too powerful," she asserts.

Namuganyi believes she is producing Architects who can also work for the disadvantaged section of community, and have the human dimension in mind. “I feel the need to change from training Architects for offices where they design good projects for rich paying clients only. So who pays for the poor?” she questions. “There is need for more of “brown” Architects. I am helping to create “brown” Architects and I am proud of it. What they do could be as simple as constructing a sustainable water tank for the community, or designing a carefully considered path, bench or meeting point. It could be painting a small bit of wall, if that is what will generate change. These community Architects care about impactful but humble projects,” she explains.



Namuganyi is grateful for the SIDA sponsorship, without which she says she would not have secured a teaching place at the University. Nonetheless, Namuganyi feels constrained in the amount of research she can embark on. “Makerere University does not allow ample time for researchers to engage in a lot of research, and this limits how else we can use the vast knowledge accumulated. I remember I had to ask my co-author from a Swedish University to present a paper on my behalf at an international conference some time back, because my teaching time table was so packed and funds were not very easily accessible. We need conditions that replicate the international research climate if we are to compete favourably,” she adds.

Supervision

She is currently supervising two MSc students, one of whom is looking at walkability in Kampala city.

Membership to Professional Organisations

- Uganda Society of Architects



Passionate about the welfare of Pregnant Women

Dr. Fatuma Namusoke

Email Contact: namusokefk@yahoo.co.uk

Doctorate Studies: Makerere University 2006-2014

Doctorate Research Area: Medicine

Title of Doctorate research: 'Sulfadoxine/ Pyrimethamine Intermittent Presumptive Treatment Relationship with newborn, Maternal Plasmodium Falciparum Infection and immunity'

Dr. Fatuma Namusoke's passion for the welfare of pregnant women and newborn babies drove her to conduct her research on Malaria – a common killer disease in Uganda. She particularly looked at the effect of Fansidar on unborn babies. Fansidar is a drug highly recommended by the Ministry of Health in the prevention of malaria in pregnant women.

"I looked at the current interventions to prevent malaria in pregnant women. I addressed how this intervention could be affecting the ability of the baby to fight malaria.

When you are young you get constant attacks of Malaria. As you grow, your body becomes immune," she explains. "Babies born to mothers living in malaria-prone areas are less susceptible to malaria attacks, especially those babies aged 0- 6 months," she adds.

Dr. Namusoke's research reveals that during pregnancy, the mother passes on her antibodies to the unborn baby and this makes the baby less susceptible. But when the baby is born, he/she will still be prone to malaria attacks, so the assumed prevention is not true. "We recommend that Fansidar continues to be given for it does not interfere with antibodies or with the baby's immunity. We sampled about 400 pregnant mothers in Mulago to reach these conclusions," she explains.





Dr. Namusoke now wants to share her findings with the Ministry of Health to add to the available information on malaria campaigns. She is optimistic that her research is going to inform how data is interpreted and hopefully contain malaria in pregnant women.

Doctorate Research Area

Malaria in pregnancy is a big problem in Uganda and it leads to adverse effects in the mother and baby including still births, intrauterine fetal growth retardation and low birth weight. The

WHO recommends using Fansidar as intermittent presumptive treatment in prevention of malaria in pregnancy. Babies born to mothers in malaria endemic areas are protected from malaria in the first six months of life by antibodies transferred from mother to baby in the intrauterine life. Recently there have been an increasing numbers of babies below six months with malaria and reason for this is not clear. Since immunity to malaria is partial and is got through repeated exposure to malaria parasites. Dr. Namusoke looked at the effect of using Fansidar (IPTp) on the ability of the newborn to prevent malaria.

The data on use of Fansidar during pregnancy is collected using self-reported data where women who have been pregnant up to five years prior to the survey are asked whether they used Fansidar for prevention of pregnancy malaria during their last pregnancy. Yet studies have shown that self-reported data may be prone to bias. Dr. Namusoke in addition looked at the validity of self-reported data of use of Fansidar for prevention of malaria in pregnancy.

Supervision

She is currently supervising

- 1 student in Masters of medicine in Obstetrics and Gynaecology
- 5 of her Master of medicine in Obstetrics and Gynaecology students have graduated

Membership to Professional Organisations

- Association of Gynecology and Obstetrics of Uganda
- Uganda Medical Doctors
- Uganda Women Doctors

“We need a policy on steel”

Dr. Christopher Senfuka

Email Contact: senfukac@gmail.com

Doctorate Studies: Makerere University, 2009 – 2014

Doctorate Research Area: Mechanical Engineering, Engineering materials

Title of Doctorate research: ‘Reliability of steel made from recycled scrap in Uganda’

Dr. Christopher Senfuka is a Lecturer of Mechanical and Production Engineering at Kyambogo University. In his Doctorate studies, Dr. Senfuka takes a critical look at the usage of scrap in the manufacturing of steel in Uganda. He is part of the formidable team that saw an order passed by the President of Uganda to stop the exportation of scrap.

“About 50-70% of Uganda’s better quality scrap was being exported to Kenya, which paid better, leaving behind poor quality scrap for local consumption. In return, Uganda kept importing scrap from neighbouring countries like Rwanda and the Democratic Republic of Congo. As of now, the President has stopped exportation of scrap and efforts are ongoing to come up with a National Iron and Steel Policy,” he explains.



Dr. Christopher Senfuka is concerned that the steel industries neither have staff development nor research and development schemes. This has kept the level of even their highest placed workers well below the technically innovative segment and made it hard to assimilate results from the ongoing research in the country, into the field. "This is in addition to the consistent failure of the country's tertiary institutions to develop syllabi that encompass technical training of workers tailored for the steel industry, such as metallurgists. We would need a policy on steel, that makes openings for the locals to be trained in creative originality production rather than routine supervision," he emphasizes.

"The quality of steel has been affected by the growing shortage of scrap. The more scrap is recycled, the poorer the quality of steel that comes from it," he says. Dr. Senfuka recommends that the sorting of scrap is improved and preferably done by agents who have the ability and time to categorise scrap and price it accordingly. He also advocates for the exploitation of the abundant iron ore resources to produce sponge iron.



In support of biogas production across Africa

Dr. Peter Walekhwa

Email Contact: walekhwap@gmail.com

Doctorate Studies: Makerere University and the Swedish University of Agricultural Sciences- Uppsala, 2006 -2010,

Doctorate Research Area: Agricultural Economics

Title of Doctorate research: 'The Socio-Economic Assessment of Bio-gas production and utilisation in Uganda'



Dr. Peter Walekhwa is part of a network of researchers, who are tirelessly working at breaking new ground on the sustainable use of biogas for the African Continent. The team, codenamed Afri-Flame, comprises of researchers from Ethiopia, Cameroon, Uganda and University of Aberdeen-Scotland, Green Heat (U) Ltd and Climate Futures,UK. They are convinced that maximum utilisation of the vast volumes of biogas from both animals and human waste is the way to go in combating the excesses of environmental degradation. Africa continues to suffer from large amounts of deforestation more so to get fuelwood. "In view of climate change and poverty alleviation, this technology is the way to go. The bye-product (slurry) from biogas generation is a huge source of fertilisers too, which in turn increases productivity on the farm and enhances household incomes," explains Dr. Walekhwa.

According to Dr. Walekhwa, research on the use of biogas in Africa started in the early 1950s but hit a lull phase for decades, although its vast benefits still hold. "We investigated why people are not using

bio-gas technology yet it is cheap and keeps the environment clean. My PhD research followed up issues of economic viability and adoption of this technology and I discovered that the main hindrance is the low levels of awareness in Uganda,” he explains. The biogas equipment comes in various affordable designs ranging from \$300 - \$2,000.

Walekhwa’s works saw him win a 3-year project from DFID on small scale bio-gas production in Uganda. This was implemented in Mpigi district, where small scale flexible bio-gas digesters were installed in Tiribogo village in 2010. Afri-flame is also working on establishing energy villages in Ethiopia, Cameroon and Uganda under funding from the African Union. In Uganda, a total of 9 biogas digesters will be installed for households in Kikati (Uganda’s energy Village), Buikwe District this year.

Supervision

- 3 PhD students researching on biogas, drought warning and loan associations.
- 5 MSc students researching on biogas production

Membership to Professional Organisations

- Uganda Agricultural Economics Association
- Uganda Agricultural Economics Association



Empowering Rural Communities Through Science

Dr. Robinah Kulabako

Email Contact: rkulabako@gmail.com

Doctorate Studies: 200... – 2010, Royal Institute of Technology & Makerere University,

Title of Doctorate research: ‘Environmental Sanitation Situation and Solute Transport in Variably Saturated soil in Peri-urban Kampala’

Dr. Kulabako is a Lecturer in Civil and Environmental Engineering, CEDAT Makerere University. Her PhD studies looked at shallow groundwater in the peri-urban areas (slums) in relation to how pollutants move from the surface into the unsaturated and saturated zones with varying levels of saturation. The major finding of her work is that excreta-disposal systems, solid waste and greywater are major contributors to the widespread shallow groundwater contamination in the low lying peri-urban settlements. The water table in these areas responds rapidly to rains due to the pervious and shallow unsaturated zone which consists of foreign material. The anthropogenically influenced unsaturated zone has a limited contaminant attenuation capacity resulting in water quality deterioration following rains. The key recommendation from her study is that intervention measures to improve the environmental sanitation and protect the shallow groundwater in the peri-urban settlements are of a multidisciplinary nature necessitating action research with community participation.

From her PhD studies, Dr. Kulabako scooped a spin-off project looking



at sanitation in Bwaise III Parish. This project, code named integrated approaches and strategies to address the Sanitation Crisis in Unsewered Slum Areas in African mega-cities (SCUSA), looks at identification and implementation of low cost integrated sanitation solutions to provide excreta and greywater management in a typical slum area, effect of slums and of environmentally sustainable sanitation in slums on groundwater and surface water quality and quantity and boundary conditions for successful implementation of sustainable sanitation solutions in the study slum and to use the lessons learned in other slum areas in Kampala. The identified greywater management technology from the SCUSA project is currently being piloted in Kasubi, another slum in Kampala under a spin off project from the SCUSA project specifically looking at greywater management in slums in sub-saharan Africa (SCUSA-Grey).



Dr. Kulabako has also trained communities in the districts of Wakiso (Kakiri), Kampala (Kasubi) and Kitgum on solid waste and greywater management and re-use. As a result of this training, these communities under CSOs have since adopted some of the waste re-use practices such as charcoal briquette, tiles from plastic waste, bags and mats from straws, tower gardening using greywater.



Back at the College, she was instrumental in initiating a new academic Graduate course 'Introduction to Environmental Modeling' in 2011/12. "Under SIDA SAREC, we procured a lot of equipment which largely made it possible for me to lobby for a new Environmental Engineering laboratory, which was granted. Most of this equipment is housed in this laboratory and is resourceful to graduate students from the college and other institutions and, also staff," she



says.

Supervision

- Five PhD students whose research is in the area of sanitation, bio-gas production, decomposition of faecal material and hydrological research.
- Six MSc students in the area of industrial effluent management, re-use of faecal sludge and low cost water treatment, Hazard Management.

Membership to Professional Organisations

- Corporate Member (in process): Uganda Institute of Professional Engineers
- Member: International Association of Hydrogeologists

Outreach services

Dr. Kulabako through consultancy services for various clients among which is NWSC, UBL, PLAN International, UNICEF/UFCU, ILRI has undertaken projects involving water quality assessments with a view of identifying treatment options, identification of incentives and disincentives affecting adoption of new technologies and innovations for effluents management in Uganda and sanitation improvement for fishing villages among others.



A collage of images representing various aspects of Nigeria, including a high-speed train, a rocket launch, a worker in a hard hat, a couple using a laptop, a person in a lab, a soccer field, a power plant, a person holding a flag, and a person climbing a tree.

Dr. Joseph Muvawala

Doctorate Studies: Makerere University, 2006 -2010

Title of Doctorate research: 'Technical Efficiency of the Primary Education System in Uganda'

Dr. Joseph Muvawala is in fresh in office as Executive Director of the National Planning Authority, NPA. He is zealous about turning the 12 year old NPA into the premier planning institution, during his four year tenure. "I want NPA to be the best. I will make it shine through a number of strategies like benchmarking with reputable international planning agencies. We should be the first advisor on any policy to both Government and the Presidency," he emphasizes.

For his **self sponsored** PhD studies in Economics at Makerere University, Dr. Muvawala looked at efficiency of Uganda's Primary Education System. "We were trying to check the cost and

rates of achieving primary education in Uganda for both government and private schools. We found that all schools were technically inefficient. Private schools invest a lot and seem to be achieving a lot but research revealed that they are below their frontiers. Government schools on the other hand need to invest more in inspection if they are to enhance learning outcomes,” he asserts.

Using the analytical experience gained while pursuing his PhD, Dr. Muvawala now wants NPA to take its rightful place as a national planner. He is convinced that more interaction between Government institutions and Academia is of priority. “I am proposing a new performance appraisal system that links the employee output to results of the Institution. I also want my staff members to publish articles in their respective policy areas and occasionally volunteer to lecture in institutions of higher learning. They have a lot of valuable practical knowledge which can feed into academia. But most importantly, the academia will help us understand what the problem is- a key aspect to finding the right solution. We need to zero down on what is holding Uganda back,” he says.

Under his guidance, NPA is looking at prioritisation of infrastructure, value addition to agricultural products, tourism, human capital development and service delivery efficiency for the next five years – as Uganda moves towards realisation of Vision 2040. “In order for Uganda to transform into a middle income country as projected in Vision 2040, we need to set achievable targets in blocks of smaller years. As an agricultural country, I have no doubt that value addition on our products will give us the much-needed boom,” he explains.

Membership to Professional Organisations

- Honorary Member, Economics Association
- Honorary Member, Statistics Association



Innovating for Slum Dwellers

Dr. Charles Niwagaba

Email Contact: cniwagaba@tech.mak.ac.ug

Doctorate Studies: Swedish University of Agricultural Sciences, Uppsala, Sweden, 2005-2009

Doctorate Research Area: Environmental Technology

Title of Doctorate research: 'Treatment Technologies for Human Feaces and Urine'.

Dr. Charles B. Niwagaba, a Senior Lecturer in the Department of Civil and Environmental Engineering, CEDAT, is passionate about improving the lives of people living in slums. Dr. Niwagaba completed his PhD at the Department of Energy and Technology, Swedish University of Agricultural Sciences (SLU), Uppsala, Sweden. At SLU, Dr. Niwagaba developed technologies for the treatment of source-separated human excreta to make it safe for resource recycling. Together with researchers from the Swiss Federal Institute of Aquatic Science and Technology



(Eawag)/Department of Water and Sanitation in Developing Countries (Sandec), they have developed an innovative way of minting money from faecal sludge produced in slums.

In another project with researchers from Eawag/Sandec, we have developed a new toilet for slums, which recycles nutrients. In another project, Dr. Niwagaba illustrates how grey water from household chores can be put to alternative use. He first developed a grey water treatment project with his Swedish main PhD advisor, Prof. Hekan Jönsson of SLU, and in this project, they designed, built and successfully tested a household grey water treatment filter in Kyebando-Kisalosalo slum. As a result of the success of this project, another scaling up project was developed together with researchers from UNESCO-IHE, Netherlands, in which 20 grey water treatment filters have been constructed to clean up grey water in the slum of Kasubi I zone.

Resource efficient technologies for the treatment of human excreta

Dr. Niwagaba has found an innovative way of minting money from human excreta or faecal matter. This involves killing the pathogens in excreta using environmentally sustainable processes to make it safe for utilization. The excreta is then used for several purposes including using it as manure for crops; trapping and anaerobically digesting it to produce biogas for cooking and lighting; or drying the waste itself and using it to burn bricks in kilns. He has disseminated this technology through local media and also, through meetings and workshops with local communities and business entrepreneurs throughout the country, as well as slum dwellers in Kampala.

Recovery toilet

Over 600,000 people in Kampala live in slums, where poor sanitation and absence of proper toilet facilities is the order of the day. It is common to find pit latrines filled, overflowing and abandoned by slum dwellers. Now with the new Resource Recovery Toilet Innovation, Dr. Niwagaba brings them new hope in managing human waste. "We are working on a resource recovery toilet for the next generation of slum users, called the Blue Diversion Toilet. This toilet is built on a concept of separating the faecal matter from urine and re-using each of them productively. The water used to flush the toilet is also pumped back, treated and re-used. With the rampant water shortages in slums, the Blue Diversion toilet facility reduces water wastage," he says. The first working model of the Blue Diversion Toilet was field tested at CEDAT and in Kifumbira and Kyebando-Kisalosalo slums in Kampala. It was taken back to the Austria-based manufacturer for re-engineering and further modifications. The second, fully re-engineered working model was successfully field tested in Mukulu slum in Nairobi.

Treatment of grey water in slums

Grey water is the wastewater from laundry, bathtubs, showers, kitchen sinks and washing dishes;



and it comprises 50–80% of the total residential wastewater generated. Grey water usually receives the least attention compared to other environmental aspects like solid waste and black water, yet it also pollutes, but at the same time, can be an important resource. In the slums, grey water is poured into drainage channels and it eventually causes a stench. By treating this water before it is allowed into the drainage, Dr. Niwagaba believes the stench will reduce. Secondly, after treatment, the water is clear and can be re-used for other purposes like gardening. He has developed a water treatment system comprised of a plastic bucket mounted into masonry wall. Inside the bucket is a layered structure aggregates, charcoal and crushed lava rock (pumice),



which performs the treatment function. The system is being piloted in Kasubi, a Kampala suburb where about 10 prototypes have been installed.

“The SIDA sponsorship opened my doors to a bigger world. I am now involved in a number of projects both at national and international levels. Thanks to SIDA,” he says.

He has 15 years experience in research, teaching and consultancy in ecological sanitation; provision of on-site urban and peri-urban sanitation and development of treatment systems for excreta and grey water; environmental impact assessments and solid waste management. Dr. Charles B. Niwagaba has been involved in various research and consultancies funded locally by Government of Uganda and by various multi-lateral agencies. Dr. Niwagaba has experience in development of innovative practices in sanitation improvement (from Engineering, social marketing to financing); recycling and re-use e.g. composting, biogas latrines, grey water treatment and use, application of faecal sludge in industrial kilns and boilers etc. Dr. Niwagaba is widely travelled, has over 50 publications in conference proceedings and refereed journals.

Policy briefs

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Graduate Students Supervision

- He has supervised five Msc students to completion, in the area of environmental engineering; and another five that are ongoing.
- Supervising 4 PhD students in the area of Environmental Engineering, looking at both technical aspects e.g. development of improved sanitation technologies; collection systems for faecal sludge as well as treatment systems for resource recovery, and non technical aspects, e.g. behaviour change to adopt improved sanitation facilities, and to operate and maintain them well, including toilet cleaning.

Membership to Professional Organisations

- Member, Uganda Association for Impact Assessment.
- Member, International Waste Working Group, IWWG.

Outreach services

- Started an NGO in 2005 called Sustainable Sanitation and Water Renewable Systems (SSWARS), www.sswarsuganda.org, which implements people centered approaches to water supply and sanitation, especially in slum areas. <http://sswarsuganda.org/>
- Construction of 156 improved toilets in 35 slums in Kampala under the project, U-ACT (Urban Affordable Clean Toilets), details at www.sswarsuganda.org





On a Mission to Eliminate Floods in Kampala

Dr. Michael Kizza

Email Contact: michael.kizza@gmail.com

Doctorate Studies: Makerere University and Uppsala University, 2006 -2012

Doctorate Research Area: Water Resources Engineering and Hydrology

Title of Doctorate research: 'Uncertainty Assessment in Water Balance Modeling for Lake Victoria'

Dr. Michael Kizza is a Manager for Drainage in Kampala Capital City Authority, KCCA. For his PhD studies, Dr. Kizza was concerned with water balance, cognizant of the water inflows and outflow for Lake Victoria.

"I found out that data available for estimating the water inflows and outflows of Lake Victoria are very limited in terms of quantity and quality, and this makes it difficult to plan effectively. I therefore developed a mathematical formulation for modelling the water balance of Lake Victoria that takes into account the most error-prone variables. For a Lake that serves many

countries in the region, it is important to have reliable estimates of its hydrology at any given time to facilitate better planning for water management and utilisation,” he explains. He is one of Uganda’s few top experts in hydrology and has shared his work with the hydro power generation industry to better predict water fluctuations and their effect on hydropower availability.

As Manager for Drainage, Dr. Kizza is in charge of planning, construction and maintenance of Kampala’s storm water drainage network. His team successfully constructed a massive drainage system at Lubigi, an initially highly flood-prone area. “By constructing a drainage channel to direct the flood waters towards River Mayanja, we significantly reduced the frequency of flooding of surrounding areas and lessened its threat to residents’ property and lives. This project has been a huge success and we intend to replicate it in other flood-prone areas of the city,” he confidently explains. The Lubigi wetland is in the neighbourhood of Kalerwe, Bwaise and Namungoona, which have high population densities mainly made of low income communities and artisan workers whose livelihood are highly sensitive to climate-related risks like flooding.

Supervision

- Supervised 5 MSc students to completion. Their research was in the area of Water Resources Engineering. He has also supervised many undergraduate students

Membership to Professional Organisations

- Member: Uganda Institute of Professional Engineers



Changing the face of Psychiatry

Dr. Noeline Nakasujja

Email Contact:

Doctorate Studies: Makerere University and Karolinska Institute - Sweden 2007 - 2011

Doctorate Research Area: Cognitive function in patients with HIV and Psychosis.

Title of Doctorate research: 'Cognitive deficits and HIV associated psychotic disorders in Uganda'

Dr. Noeline Nakasujja is the Ag. Head of the Psychiatry Department, College of Health Sciences Makerere University. For her PhD studies, she compared cognition and psychotic disorders in people living with HIV AIDS and those living without it. Psychosis is a mental health condition in which an individual loses touch with reality. For this research, Dr. Nakasujja sampled a total of 156 HIV positive and 322 HIV negative individuals in Butabika Psychiatric National Referral Hospital.

"This study is the first of its kind in the detailed assessment of cognitive function for HIV AIDS patients who have mental illness. I discovered that these patients perform poorly in comparison to patients who have psychosis only. This is partly because HIV alone affects the process of acquiring knowledge and understanding through thought, experience, and the senses. So the presence of psychosis compounds the problem even further," she explains.

"I also discovered that there are certain types of psychiatric



disorders in HIV positive patients that do not fall in any of the major categories of mental illness. My study helps future researchers and medical practitioners identify the different ways that HIV positive patients will psychotic disorders present and subsequently how they should be managed,” she adds.

By joining the Psychiatry Department and researching on mental health, Dr. Nakasujja braved the stigma enacted by younger and sometimes older fellow health workers towards the discipline. Among some of the myths associated with the stigma for the practise was the belief that the profession was for the older generation that if you practised then you became like the patients one treated.

She has since inspired other students to choose a career in psychiatry. “I hear comments that having young people in the discipline now has changed the face of psychiatry for the better. I joined medicine to help people and I realised there was a gap in psychiatry since many students opt for gynaecology, paediatrics, obstetrics and internal medicine as first options. I am glad that this is beginning to change as many students get inspired to join psychiatry. The need is dire given the many challenges that stress people across all age brackets, resulting into mental distress as well as the complications that arise with it,” she asserts.

Awards and Recognitions work and research during the time of pursuing the PhD:

- 2006: Best Scientific Poster, Course on Leadership & Professional skills for young psychiatrists, Addis Ababa Ethiopia; Certificate
- 2006: Best presenter, Best Young Researcher, Faculty of Medicine and Institute of Public Health, Makerere University 2nd Annual Scientific conference: Plaque
- 2007: Best Scientific Poster, Course on Leadership & Professional skills for young psychiatrists from African countries, Nairobi, Kenya: Certificate
- 2009: Outstanding Mentor Award from the American Academy of Child and Adolescent Psychiatry; Plaque
- 2010: Recognition for Scientific Achievements Award, Uganda Society for Health Scientists; Plaque

Graduate Students Supervision

- 2 PhD students
- She has successfully supervised four MA students to completion.

Membership to Professional Organisations

- Uganda Medical Association
- Association of Uganda Women Doctors Association



- Mental Health Research Club
- Africa Psycare Research Organization
- Uganda Psychiatric Association
- World Psychiatrist Association.
- International Psycho geriatric Association
- The Network: Towards Unity For Health (Task force Chair)
- Alzheimer's International Society
- Board Member, Uganda Society for Health Scientists

Conclusions and Recommendations

The motivation for the study was to determine the productivity, employability and mobility of doctorates trained at Makerere University for the period 2000-2012. This information is critical in determining the trajectory of doctorate training for the University.

Conclusions

The capacity to train and graduate students at doctoral level at Makerere University has greatly improved over the period 2000-2012. The university has more than doubled its average annual doctoral outputs from 23 graduating in 2000 to 61 graduating in 2012. More than 300 doctorates have been awarded in the same period. Most of this capacity was ambient in the science disciplines. Emerging capacity was evident in the College of Health Sciences from the period 2006 to 2012 with support from the University Development Partners like Sida and Norad.

The training at the doctorate level faced a ravenous thirst; the need for doctorates in the country by far outstripped the capacity to train them. Almost all (97%) of the respondents were employed in fields related to their training. To link the capacity and the demand, there is need for leveraging the latent capacity to produce the doctorates required for the knowledge economy. Funding is required for infrastructure, equipment, recruitment and retention of qualified staff. According to the Directorate of Research and Graduate Training, doctoral students at Makerere University needed on average over 10,000 United States Dollars (approximately PPP USD 25,000) per year for their training. The GDP per capita (PPP) for Uganda was \$1,400 in 2012, which is way lower than the annual cost of training.

The country had not specifically put a number to its aspiration of high-level knowledge production unlike countries such as South Africa and the United States. South Africa aspires to produce 6000 doctorates per year by 2030 from the rate of 1400 in 2012. China produced over 50,000 doctorates in 2009, probably the largest in the world. Uganda produces less than 100 doctorates per year on average giving an annual production rate of 1 doctorate for every 300,000 people. South Africa's average annual rate is 1 doctorate for every 33,000 people whereas that of China is 1 doctorate for every 27,000. United States' annual rate was 1 doctorate for every 15,000 people. The annual doctoral production rate for Uganda needs to be multiplied by 10 to reach the South African current rate. This could be scaled for a period of 10 years to reach 1000 doctorates per year by 2025.



The high cost of doctoral training has hampered effective demand for this training. This may partly explain the average late start of doctoral training, the scanty enrolment, long stay and the sequential lock-ins and lock-outs. Most of the training was externally funded as a consequence. This being a stopgap measure, presents the challenge to the University and Uganda to mobilize internal resources for sustainable growth in doctoral training.

There is a major challenge in retaining the doctorates trained at Makerere University. A large proportion (92%) of the respondents indicated they would leave the country once an opportunity arose. Low salaries and benefits were the major demotivating factors. It is critical that the employers of these doctorates strive to pay emoluments that are fairly comparable to those paid to their colleagues within the region.

The demographic characteristics of the respondents revealed that the proportion of female doctorates was 23%. This low representation reverberates into similarly disproportionate representation in leadership and seniority at decision-making bodies in the institution and the country. There is need for funding that specifically targets female applicants for doctorate training.

Recommendations

1. The University needs to mobilize external resources for training to supplement the internal resources in the medium term (next 10 years). The doctorate training costs cannot be fully raised nationally considering the low household incomes;
2. The supply for doctorates needs to be increased to meet the increasing demand for doctorates; emanating from the expanding higher education sector, increasing research institutions & statutory bodies and the emerging system of innovations. The country needs to systematically increase its annual doctorate production rate to reach 1000 doctorates per year by 2025. Makerere University has latent potential (in terms of supervision) to produce over 200 doctorates per year. The track to graduation needs to be smoothened to improve the throughput;
3. The gender imbalance in the training should continue being addressed as to promote equitable participation of both men and women;
4. The tendency for doctorate holders to move to better economic zones may create despondency at the work place and lower productivity. This needs to be stymied to minimize brain drain that costs Africa million of dollars .

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³ Countries in Sub-Saharan Africa have lost a tremendous amount of their educated and skilled populations as a result of emigration to more developed countries, which has harmed the ability of such nations to get out of poverty. Conservatively speaking, "Brain drain has cost the African continent over \$4 billion in the employment of 150,000 expatriate professionals annually (http://en.wikipedia.org/wiki/Human_capital_flight).



APPENDICIES

Table P1. Doctorate holders by sex and age class

	Men	2010 Women	Unknown	Total
Less than 35 years old	4	3		7
35-44 years old	72	22		94
45-54 years old	85	24		109
55-64 years old	35	14		49
65-69 years old	8	0		8
Unknown			4	4
Granad Total	204	63		271

Citizens of Uganda of which

	Citizens by birth	Citizens by naturalisation	Unknown type	Total
Natives	266	3	2	271
Foreign				
Unknown				
Total	266	3	2	271

Table P3. Doctorate holders by sex and Country of citizenship

	Men	Women	Unknown	Total
By birth	198	59	3	260
by naturalisation	2	1	0	3
Permanent resident	4	3	0	7
Unknown type of citizen	1	0	0	1
Grand Total	205	63	3	271

Table P4. Doctorate holders citizenship/ residence status and age class

	citizenship of Uganda by Birth	Parmanent Residents	Naturalisation	Unknown	Total
Less than 35 years old	7	0			7
34-44 years old	90	3	1		94
45-54 years old	103	4	2		109
55-64 years old	49				49
65-69 years old	7	0		1	8
Unknown	4				4
Grand Total	260	7	3	1	271

New OCDE FOS Classification Citizens of Uganda		Grand Total 271
1	NATURAL SCIENCES	
1.1	MATHEMATICS	8
1.2	COMPUTER AND INFORMATION SCIENCE	9
1.3	PHYSICAL SCIENCES	5
1.4	CHEMICAL SCIENCES	6
1.5	EARTH AND ENVIRONMENTAL SCIENCES	3
1.6	BIOLOGICAL SCIENCES	34
1.7	OTHER NATURAL SCIENCES	2
2	ENGINEERING AND TECHNOLOGY	
2.1	CIVIL ENGINEERING	8
2.2	ELECTRICAL ELECTRONIC AND INFOR	3
2.3	MECHANICAL ENGINEERING	2
2.4	CHEMICAL ENGINEERING	
2.5	MATERIALS ENGINEERING	
2.6	MEDICAL ENGINEERING	
2.7	ENVIRONMENTAL ENGINEERING	
2.8	ENVIRONMENTAL BIOTECHNOLOGY	
2.9	INDUSTRIAL BIOTECHNOLOGY	
2.11	NANOTECHNOLOGY	
2.12	OTHER ENGINEERING AND TECCHNOLOG	4
3	MEDICAL AND HEALTH SCIENCES	
3.1	BASIC MEDICINE	9
3.2	CLINICAL MEDICINE	1
3.3	HEALTH SCIENCES	3
3.4	MEDICAL BIOTECHNOLOGY	4
3.5	OTHER MEDICAL SCIENCES	1
4	AGRICULTURAL SCIENCES	
4.1	AGRICULTURE FORESTRY AND FISHERI	26
4.2	ANIMAL AND DAIRY SCIENCE	7
4.3	VETERINARY SCIENCE	16
4.4	AGRICULTURAL BIOTECHNOLOGY	1
4.5	OTHER AGRICULTURAL SCIENCES	4
5	SOCIAL SCIENCES	
5.1	PSYCHOLOGY	5
5.2	ECONOMICS AND BUSINESS	7
5.3	EDUCATION SCIENCES	18
5.4	SOCIOLOGY	1
5.5	LAW	3
5.6	POLITICAL SCIENCES	1
5.7	SOCIAL AND ECONOMIC SCIENCES	4
5.8	MEDIA AND COMMUNICATION	4
5.9	OTHER SOCIAL SCIENCES	9
6	HUMANITIES	
6.1	HISTORY AND ARCHAEOLOGY	9
6.2	LANGUAGES AND LITERATURE	8
6.3	PHILOSOPHY ETHICS AND RELIGION	13
6.4	ARTS	19
6.5	OTHER HUMANITIES	4
6.6	UNSPECIFIED FIELD OF DOCTORAL AWARD	12

Table P6. Doctorate holders by sex and country of birth

	Men	Women	Unknown	Total
Born in Uganda	205	63	3	271

Table P7. Doctorate holders by place of birth/residence status and Age class

	Born in Uganda
Less than 35 years old	7
35-44 years old	94
45-54 years old	109
55-64 years old	49
65-69 years old	8
Unknown	4
Grand Total	271

Table EDU1. Doctorate holders by citizenship/residence status and Region of doctoral award

	Citizens of Uganda by birth	Permanent Residents	Naturalisation	Unknown type of status	Total
Doctorate degree received in Uganda	260	7	3	1	271
Grand Total	260	7	3	1	271

Table EDU2. Doctorate holders by place of birth/residence status and region of doctorate award

	Born in Uganda	Unknown country of birth	Total
Doctorate degree received in Uganda	270		270
Unknown		1	1
Grand Total	270	1	271

Table EDU3. Doctorate holders by place of Doctoral award and place of ISCED 5 training

Place of prior education	Place of Doctoral degree award In Uganda
Previous degree obtained in Uganda (ISCED 5 LEVEL)	46
Previous degree obtained in another country	15
Unknown place of prior education	210
	271

Table EDU5. Doctorate holders by main field of doctorate award and primary source of funding

Primary source of funding	Field of doctoral award							TOTAL
	NATURAL SCIENCES	ENGINEERING AND TECHNOLOGY	MEDICAL AND HEALTH SCIENCES	AGRICULTURAL SCIENCES	SOCIAL SCIENCES	HUMANITIES	UNSPECIFIED FIELD	
Fellowship or scholarship from an institution in Uganda	2		1	5	6	3	5	22
Fellowship or scholarship from abroad	16	1		5		1	3	26
Teaching and/or research assistantship	2			1				3
Employer reimbursement or assistance	2					1	3	6
Loan, personal savings, support from spouse, partner or family	0				3			3
Other occupation				1				1
Unknown	43	16	17	42	43	48	1	210
TOTAL (all sources of funding)	65	17	18	54	52	53	12	271

Table EMP2.1 Employment status and field of Doctorate degree

FIELD OF DOCTORAL AWARD	EMPLOYED								
	Situation in employment			Type of contract			Working time		
	Employee	Self-employed	Unspecified	Permanent contract	Temporary contract	Unspecified contract	Full time employment	Part time employment	Unspecified
NATURAL SCIENCES	63	0	2	54	8	3	58	0	7
ENGINEERING AND TECHNOLOGY	16	0	1	15	1	1	16	0	1
MEDICAL AND HEALTH SCIENCES	18	0	0	13	4	1	18	0	0
AGRICULTURAL SCIENCES	54	0	0	46	7	1	53	0	1
SOCIAL SCIENCES	50	0	2	45	6	1	48	0	3
HUMANITIES	53	0	0	47	6	0	52	0	1
UNSPECIFIED FIELD	9	0	3	9	0	3	7	0	6
TOTAL	263	0	8	229	32	10	252	0	19

Table EMP2.2 Employment status and age class

Age class	EMPLOYED									
	Situation in employment			Type of contract				Working time		
	Employee	Unspecified	Total	Permanent contract	Temporary contract	Unspecified contract	Total	Full time employment	Unspecified	Total
Less than 35 years old	7	0	7	6	1	0	7	7	0	7
35-44 years old	92	2	94	85	7	2	94	89	5	94
45-54 years old	104	5	109	101	4	4	109	100	9	109
55-64 years old	48	1	49	31	16	2	49	46	3	49
65-69 years old	8	0	8	4	3	1	8	8	0	8
Unknown		4	4			4	4		4	4
TOTAL EMPLOYED	259	12	271	227	31	13	271	250	21	271

Table EMP2.3 Employment status and citizenship

EMPLOYED										
Age class	Situation in employment			Type of contract				Working time		
	Employee	Unspecified	Total	Permanent contract	Temporary contract	Unspecified contract	Total	Full time employment	Unspecified	Total
Citizens of Uganda	262	8	270	228	32	10	270	252	18	270
Unknown citizenship	1		1	1	0	0	1		1	1
TOTAL	263	8	271	229	32	10	271	252	19	271

Table EMP3. Doctorate holders by Employment status and primary source of funding

EMPLOYED											
Primary source of funding	Situation in employment				Type of contract				Working time		
	Employee	Self-employed	Unspecified	Total	Permanent contract	Temporary contract	Unspecified contract	Total	Full time employment	Unspecified	Total
Fellowship or scholarship from an institution in Uganda	20	0	2	2	18	1	3	22	17	4	21
Fellowship or scholarship from abroad	22	0	4	4	21	2	3	26	16	10	26
Teaching and/or research assistantship	3	0	0	0	2	0	1	3	2	1	3
Employer reimbursement or assistance	4	0	2	2	4	0	2	6	4	2	6
Loan, personal savings, support from spouse, partner or family	3	0	0	0	3	0	0	3	2	1	3
Other sources	1	0	0	0	1	0	0	1	1		1
Unknown unknown sources	110	0	0	0	180	29	1	210	210	1	211
Total respondents	163	0	8	171	229	32	10	271	252	19	271

Table PERC1.1. Employed doctorate holders: Perception regarding their job Qualification by Sex and Year of Doctoral Award

Year of Doctoral award	Job relation to the doctorate degree											
	Closely related				Partly related				Not related			
	Male	Female	Unknown Gender	Total	Male	Female	Unknown Gender	Total	Male	Female	Unknown Gender	Total
Before 1990	2			2								
1990	1			1								
1991												
1992												
1993					1		1	1				
1994												
1995												
1996	1			1								
1997	1			1								
1999	3			3								
2000	3			3								
2001	3	1		4								
2002	1			1								
2003	3	1		4								
2004	1			1								
2005	4	3		7								
2006	2			2		1	1	1				
2007	2			2								
2008	2			2								
2009	6	3		9								
2010	3	1		4								
2011	2	1		3								
Unkown Year												
Total Employed	40	10		50	1	1	2	2				

Table PER1.2 Perception regarding their job Qualification by Sex and field of doctorate degree

Field of Doctoral award	Job relation to Doctorate degree								
	Related			Partly related			Not related		
	Men	Women	Unknown gender	Men	Women	Unknown gender	Men	Women	Unknown gender
NATURAL SCIENCES	19	1		1					
ENGINEERING AND TECHNOLOGY	1								
MEDICAL AND HEALTH SCIENCES									
AGRICULTURAL SCIENCES	8	4							
SOCIAL SCIENCES	3								
HUMANITIES	4								
UNSPECIFIED FIELD	6								
Total employed	41	5	0	1	0	0	0	0	0

Table PER2.1. Employed Doctorate holders: Satisfaction with their employment situation by sex and criteria of satisfaction

	Very satisfied			Somewhat satisfied			Somewhat dissatisfied			Very dissatisfied		
	Men	Women	Unknown gender	Men	Women	Unknown gender	Men	Women	Unknown gender	Men	Women	Unknown gender
Salary	0			12	2	1	12	5	1	19	5	0
Benefits	2	1		6	2		20	3	2	14	6	0
Job security	21	9	1	18	4	1	2			1		
Job location	29	9	2	10	3		3	1		0		
Working conditions	4	3		14	3	1	13	4	1	11	2	
advancement	14	6		19	4	1	5	2	1	5	1	
Intellectual challenge	24	7		12	4	2	5	1		1	1	
Level of responsibility	17	4	1	19	5	1	4	3		3	1	
Degree of responsibility	26	6	1	12	5	1	3	1		2	1	
Contribution to society	14	7		24	5	2	4	1		1		
Social status	10	6	1	20	5		9	1	1	4	1	
Overall level of satisfaction	4	1		28	7	1	9	3	6	3	2	0

Table PER2.2 Employed doctorate holders: Satisfaction with their employment situation by research status and criteria of satisfaction

	Very satisfied		Somewhat satisfied		Somewhat dissatisfied		Very dissatisfied	
	Employed as a researcher	Employed not as a researcher	Employed as a researcher	Employed not as a researcher	Employed as a researcher	Employed not as a researcher	Employed as a researcher	Employed not as a researcher
Salary			13	1	18		20	2
Benefits	2		8		22	2	18	1
Job security	28	2	21	1	2		1	
Job location	37	2	12		3	1		
Working conditions	6		17	1	16	2	12	
Opportunities for advancement	19		22	1	7	1	4	1
Intellectual challenge	28	2	17		6		1	1
Level of responsibility	19	2	24		7		2	1
Degree of Indipendence	30	2	18		3		1	1
Contribution to society	20		28	2	4	1		
Social status	16	1	23	1	11		2	2
Overall level of satisfaction	5		32	2	12		3	1

Table OMOB1. Mobility intentions in the next year by country of intended destination

	Citizens of Uganda
of which: no intentions to move out of Uganda	29
Intentions to move out of Uganda	39
INTENDED DESTINATION	
ETHIOPIA	1
KENYA	6
KOREA	1
NETHERLANDS	1
NORWAY	1
SOUTH AFRICA	3
SOUTH SUDAN	1
TANZANIA	2
USA	3
Intentions an destination not known	252

Reasons for choosing a research career	Sex Male	Female
Creativity and innovativeness of work	32	9
Well paid job	1	1
Benefits	11	3
Opportunities for advancement	32	7
Job security	10	3
Working conditions	4	0
Degree of independence	16	3
Contribution to society	21	6
Other employment not available		
Research generally expected for career	26	7
Specific interest for research work	17	6

Articles co-authored by Sex

	male	female	not known
< 10	18	6	1
10 - 19	11	2	1
20 - 29	8		1
30 - 39	3		
40 - 49			
50+	1		
Total	41	8	3

Books, monographs, and book chapters, (co)authored by you, have been published by Sex

		male	Gender female	not known
Number of books, monographs, and book chapters, (co)authored	0	18	3	
	1	8	3	
	2	4	2	
	3	5	1	1
	4	4	0	1
	5	4	2	0
	7	1		
	8	1		
	10	1		
Total		46	11	2

Patent applications have you been named as an inventor between January 1990 and 2010 and sex

		male	Gender female	not known
Number	0	46	10	2
	2	1		
Total		47	10	2

How many patents have been granted to you as an inventor between January 1990 and 2010

		male	Gender female	not known
Number	0	45	11	2
	10	1		
Total		46	11	2

Have you started up a company between January 1990 and December 2010? And Sex

		male	Gender female	not known
Number	0	1	0	0
	1	7	1	1
	2	24	9	1
Total		32	10	2

How many of your patents have resulted in commercialized products and Sex

		male	Gender female	not known
How many of your patents have resulted in commercialized products	0	46	11	2
	1			
	2			
Total		46	11	2

Mentorship programs or training programs between January 1990 and 2010 and sex

		male	Gender female	not known
Have you conducted mentorship programs or training programs between Jan	Yes	35	8	1
	No	4		
	Unspecified	7	5	1
Total		46	13	2

Research in cooperation with research groups outside the country by Sex

		male	Gender female	not known
Have you conducted research in cooperation with research groups outside	Yes	32	7	1
	No	10	2	
	Unspecified	4	4	1
Total		46	13	2



Makerere University PhD Graduates

Name	Gender	Specialisation	Congregation
Maina Wamuyu Gekenia	Female	Medicine	37
Muranga Isabirye Florence	Female	Science	37
Kakudidi Kyomugisha Esezah	Female	Science	38
Muhanguzi Ruhinda Dickens Hosea	Male	Agriculture	37
Cula Andrew Anthony	Male	Education	37
Tamale Bakaluba Maurice	Male	Education	37
Odwee Jonathan	Male	Statistics	37
Barifaijo Erasmus	Male	Science	37
Okot-Okumu James	Male	Science	37
Mugisha Joseph Yokana Tindimubona	Male	Science	38
Ssebuliba James Mutumba	Male	Agriculture	38
Nakimera Immaculate	Female	Science	39
Mirembe Ntangaare Mercy	Female	Arts	40
Tukamuhabwe Phinehas	Male	Agriculture	39
Ntawuruhunga Phé'neas	Male	Agriculture	39
Oonyu Joseph	Male	Education	39
Biryabarema Micheal	Male	Science	39
Mucunguzi Patrick	Male	Science	39
Mucunguzi-Rugwebe Eriam Rwansuju Robert	Male	Science	39
Kanzikwera Clement	Male	Agriculture	40
Musana Paddy	Male	Arts	40
Mango John Magero	Male	Science	40
Bakuneeta Christopher	Male	Science	40
D'ujanga Mutonyi Florence	Female	Science	41
Kyarisiima Connie Cleona	Female	Agriculture	42
Nabukenya Ssebuliba Ruth	Female	Agriculture	42
Nampala Paul	Female	Agriculture	42
Nassanga Goretta Linda	Female	Arts	42
Bananuka John Armstrong	Male	Agriculture	41
Sekamatte Muyinza Benon	Male	Agriculture	41
Barton John	Male	Arts	41
Otiti Tom	Male	Science	41
Seeti Mike	Male	Science	41
Mumbi Patrick	Male	Arts	42
Besigye Bafaki Gad Edward	Male	Science	42
Sande Eric	Male	Science	42

Mushemeza Elijah	Male	Social Sciences	42
Ssamula Mathias	Male	Social Sciences	42
Kasule Kizito Maria	Male	Industrial Art	43
Muwanika Bampalana Vincent	Male	Science	43
Waiswa Charles	Male	Veterinary Medicine	43
Kabi Fred	Male	Agriculture	43
Kaliisa Anasi Addunoor	Male	Agriculture	43
Rugyendo Medard	Male	Agriculture	43
Tugume Lubowa Hassan	Male	Agriculture	43
Tusabe Gervase	Male	Agriculture	43
Okello Atwaru Denis	Male	Education	43
Busuulwa Ssebuliba Henry	Male	Science	43
Kisolo Wodulo Nabbungu Akisophel	Male	Science	43
Ocaido Michael	Male	Veterinary Medicine	43
Matsiko Biryabaho Frank	Male	Agriculture	43
Ezati Agnes Betty Akullu	Female	Education	46
Nakavuma Jesca	Female	Veterinary Medicine	46
Aritua Valente	Male	Agriculture	45
Bua Bosco Okonzi	Male	Agriculture	45
Karoro Ahimbisibwe Emmanuel	Male	Education	45
Ocheng Kagoire Theophira Mary	Male	Education	45
Masaba Wakoko Charles	Male	Education	45
Muyingo John Chrysostom	Male	Education	45
Neema Abooki Peter	Male	Education	45
Kasenene Serugo Edris	Male	Education	45
Eilu Gerald	Male	Science	45
Kakuru Willy	Male	Science	45
Okaronon Obbo John	Male	Science	45
Nuwagaba Augustus	Male	Social Sciences	45
Mukalazi Julius	Male	Agriculture	46
Tusiime Geoffrey	Male	Agriculture	46
Wanaku Boniface	Male	Agriculture	46
Masaazi Fred Masagazi	Male	Education	46
Hafashimana David	Male	Science	46
Kamatenesi maud Mugisa	Male	Science	46
Obwoya Kinyera Sam	Male	Science	46
Sekabembe Beatrice	Female	Education	48
Kyalikunda Justin	Female	Education	48
Otali Emily	Female	Environment	48
Majaliwa Mwanjalol Jackson Gilbert	Male	Agriculture	47
Kato Habib	Male	Agriculture	47

Kiiza Hilary	Male	Arts	47
Bakunda Geoffrey	Male	Commerce	47
Ntayi Mpeera Joseph	Male	Commerce	47
Sejjaka Kisakye Samuel	Male	Commerce	47
Kalema James	Male	ENR	47
Nkurunungi John Bosco	Male	ENR	47
Twinomugisha Ben Kiromba	Male	Law	47
Kazibwe Francic	Male	Science	47
Mudiope Joseph	Male	Agriculture	48
Mugisha Silver	Male	Civil Engineering	48
Kahindo Muzusa Ngabo Charles	Male	Environment	48
Bahati Joseph	Male	Forestry	48
Kibona Stafford	Male	Veterinary Medicine	48
Nizeyi John Bosco	Male	Veterinary Medicine	48
Okello Sam	Male	Veterinary Medicine	48
Mutekanga David Robinson	Male	Zoology	48
Namuswe Gladys Bwanika	Male	Zoology	48
Omiel Okoth Josue	Male	Zoology	48
Koojo Amooti Charles	Male	Arts	49
Hyuha Theodora Shuwu	Female	Agricultural Economics	51
Kabirizi Mary Lourdes	Female	Agriculture	52
Dumba Robinah	Female	Zoology	52
Kibanja Grace Milly	Female	Psychology	52
Kaguhangire-Barifaijo Maria Vincent	Female	Education	53
Kinungu-Karindiriza Evelyn	Female	Education	53
Ddungu Livingstone	Male	Education	50
Muwagga Mugagga Anthony	Male	Education	50
Horicubonye Ildephonse	Male	Arts	50
Tuhirirwe Christopher	Male	Arts	50
Masembe Charles	Male	ENR	50
Okello John Bosco Acot	Male	ENR	50
Kabumbuli Robert	Male	Social Sciences	51
Kaaya Archileo Natigo	Male	Food Sci & Tech	51
Mbabazi Dismas	Male	Science	51
Wabinga Henry Rocky	Male	MD	51
Tindiwensi Dan	Male	Civil Engineering	52
Bamwerinde Wilson	Male	Forestry	52
Baryarama Fulgentius	Male	Mathematics	52
Kasozi Juma	Male	Mathematics	52
Nemeye Pontiano Sebba	Male	Entomology	52
Owor Michael	Male	Geology	52

Katcho Karume Cisirika	Male	Physics	52
Sekiranda Stephen Brian Kintu	Male	ENR	52
Nabulo Grace	Female	Botany	54
Karungi Jeninah	Female	Agriculture	54
Karungi Sharon	Female	Civil Engineering	55
Ipulet Perpetua	Female	Environment	56
Amoding Alice	Female	Agriculture	57
Katagira Franscisca Francis Lubega	Female	Agriculture	57
Odongo-Aginya Emmanuel Igwaro	Male	Bio-Chemistry	54
Onen David	Male	Education	54
Lwasa Shuaib	Male	Land Use & Regional Dev't	55
Biraba Allan Kenneth	Male	Architecture	55
Nkaada Daniel	Male	Education	56
Odubuker Picho Epiphany	Male	Education	56
Ssegawa Dalton Elijah	Male	Education	56
Mangeni Bennie Tabbu	Male	Civil Engineering	56
Muwuluke Zikusooka Jimmy	Male	Civil Engineering	56
Sebisubi Fred Musoke	Male	Medicine	56
Tugumisirize Joshua Makiika	Male	Medicine	56
Twinomugisha Dennis	Male	Environment	56
Mukuralinda Athanase	Male	Forestry	57
Mugisha Samuel	Male	Science	57
Ssegawa Paul	Male	Botany	57
Sendagire Hakim	Male	Biochemistry	57
Mubiru James	Male	Physics	57
Otim Michael Hilary	Male	Agriculture	57
Nambi Kasozi Justine	Female	Agriculture	59
Ochwo Mildred Kathryn	Female	Agriculture	59
Sendikadiwa Eunice Nakato Nankuba	Female	Arts	59
Nagenda Musana Assumpta Namulinde	Female	Architecture	59
Andama Edward	Male	Botany	58
Bakkabulindi Fred Edward	Male	Education	58
Musinguzi Moses	Male	Surveying	58
Tumwine Fredrick Buhiire Ruguma	Male	Population Studies	58
Acai Okwee James	Male	Veterinary Medicine	58
Kaye Dan	Male	Medicine	58
Mubiru Sarah Lubanga	Male	Agriculture	58
Bagumire Ananias	Male	Agriculture	59
Nanyeenya William	Male	Agriculture	59
Osiru Moses	Male	Agriculture	59

Ssemakula Edward	Male	Agriculture	59
Kaibanda Kambanda Mbaraga Charles	Male	Arts	59
Kasiima Steven Munanura	Male	Arts	59
Odongo Michael Moses	Male	Civil Engineering	59
Were-Higenyi Frederick Millan	Male	Civil Engineering	59
Arinaitwe Lucian	Male	Education	59
Pido Saverio	Male	Education	59
Ssettumba John Bosco	Male	Education	59
Asingwire Narathius	Male	Social Sciences	59
Biryomumaisho Savino	Male	Veterinary Medicine	59
Okello Kenneth Lapenga	Male	Veterinary Medicine	59
Tweyongyere Robert	Male	Veterinary Medicine	59
Byamukama Robert	Male	Science	59
Kityo Robert Martin	Male	Science	59
Otieno Ndhine Edwardina Aloo	Male	Science	59
Rwego Bidason Innocent	Male	Science	59
Vuzi Peter Carlifonia	Male	Science	59
Kawooya Michael Grace	Male	Medicine	59
Rwashana Agnes Semwanga	Male	Computer Science	59
Byamugisha Josephat	Male	Medicine	59
Muhwezi Winston Wilson	Male	Medicine	59
Obua Celestino	Male	Medicine	59
Okello Sarikaeli Elialilia	Male	Medicine	59
Gichuru Virginia Cathoni	Female	Agriculture	60
Atuyambe Lynn	Female	Medicine	60
Banura Cecli	Female	Medicine	60
Tumuwikrize Winifred	Female	Medicine	60
Nsungwa Sabiiti Jesca	Female	Public Health	60
Badaza Nakileza Rose	Female	Science	60
Esaete Josephine	Female	Science	60
Apio Anna	Female	Veterinary Medicine	60
Nanteza Ann	Female	Veterinary Medicine	60
Mattattical Ninan Chandy	Female	Education	60
Kirumira Rose Namubiru Florence	Female	Fine Art	60
Katono Nzarwa	Female	Arts	60
Ekere William	Male	Agriculture	60
Kakuhenzire Rogers	Male	Agriculture	60
Katongole Constantine	Male	Agriculture	60
Kugonza Donald Rugira	Male	Agriculture	60
Mugasi Katambi Samuel	Male	Agriculture	60
Ogwok Patrick	Male	Agriculture	60

Asiimwe Benon	Male	Medicine	60
Ateenyi Charles Agaba	Male	Medicine	60
Muytyaba Twaha Serunjogi	Male	Medicine	60
Ntale Muhammad	Male	Medicine	60
Onen Churchill	Male	Medicine	60
Rutebemberwa Elizeus	Male	Public Health	60
Behangana Mathias	Male	ENR	60
Bagabo Samuel Michael	Male	Forestry	60
Omeja Patrick Avia	Male	Forestry	60
Nyakoojo Clement	Male	Science	60
Owori Wadunde	Male	Science	60
Ssebugenyi Cyrus Seera	Male	Science	60
Wasswa John	Male	Science	60
Okidi Peter Lating	Male	Technology	60
Niwagaba Buregeya Charles	Male	Technology	60
Senkatuka Ian	Male	Technology	60
Ngoma Muhammed	Male	Mkting & Hosp. Mgt	60
Manyire Henry	Male	Social Sciences	60
Mbaaga Frank	Male	Social Sciences	60
Kitoogo Edward Fredrick	Male	IT	60
Maiga Gilbert	Male	IT	60
Acham Hedwig	Female	Agriculture	61
Magala-Nyago Christine Solomy Bogere	Female	Agriculture	61
Kulabako Robinah	Female	Civil Engineering	61
Katuura Esther	Female	Medicine	61
Balinda Sheila Nina	Female	ENR	61
Nalugwa Allen	Female	ENR	61
Mbeiza Mutekanga Norah	Female	Science	61
Nyadoi Priscilla	Female	Forestry Special	
Tibenderana Prissy Gajurenda Kateete	Female	Info.Systems	Special
Tukahebwa Muheki Edrinah	Female	Public Health	Special
Kitutu Kimomo Mary Goretti	Female	Science Special	
Katuromunda Sylvester	Male	Agriculture	61
Otsyula Reuben Masheti	Male	Agriculture	61
Walekhwa Peter Nabusi	Male	Agriculture	61
Tibayungwa Francis	Male	Agriculture	61
Tumuhairwe John Baptist	Male	Agriculture	61
Kizito Frank	Male	Civil Engineering	61
Odida Michael	Male	Medicine	61
Olupot Wilberforce Peter	Male	Mechanical Engineering	61
Nsoby Sam Lubwama	Male	Medicine	61

Okwi Andrew	Male	Medicine	61
Ayebazibwe Chrisostom	Male	ENR	61
Munyuli Bin Mushambany Theodore	Male	ENR	61
Sangula Abraham Kiprotich	Male	ENR	61
Twesigye Kakuhikire Charles	Male	ENR	61
Kwetegyeka Justus	Male	Science	61
Twesigye-Omwe Moses Nduhira	Male	Science	61
Mwine Norbert Frank	Male	ENR	Special
Sendegeya Almas	Male	Technology	Special
Bilali Athmani	Male	Educ.Planning,Admin	
		& Mgt.	Special
Mulumba Bwanika Mathias	Male	Educ.Planning,Admin	
		& Mgt.	Special
Nsookwa John Chryzostom	Male	Education	Special
Sekabira Kassim	Male	Science	Special
Mugisha Lawrence	Male	Veterinary Medicine	Special
Muyinza Harriet	Female	Agriculture	62
Nalwanga Dianah	Female	ENR	62
Bakeera Solome Kiribakka	Female	Public Health	62
Beyeza Kesheya Jolly	Female	Obs & Gyns	62
Kyokunda Lynnette Tumwine	Female	Pathology	62
Nakasujja Noline	Female	Medicine	62
Nakiggudde Janet	Female	Psychiatry	62
Ndeezi Grace	Female	Paediatrics	62
Nannyonga Betty	Female	Mathematics	62
Nakalembe Immaculate	Female	Medicine	62
Kaddu Sarah Birungi	Female	Info.Science	62
Musanabera Helen	Female	Info.Science	62
Muwonge Sarah Nkonge	Female	Educational Mgt, Planning & Admin	62
Nabayego Catherine	Female	Educational Mgt, Planning & Admin	62
Kassa Elizabeth Bwanga	Female	Economics	62
Beyene Dereje Degefe	Male	Agriculture	62
Mbanzibwa Deusdedith Rugaiukamu	Male	Agricultural-Crop Science	62
Tumwegamire Silver	Male	Agriculture	62
Okiror John James	Male	Agricultural Extension	
		Education	62
Kisakye John Mbago Joseph	Male	ENR	62
Kaluuba Livingstone Listone	Male	Communication	
		Engineering	62

Lubega Muhammed	Male	Public Health	62
Bangirana Paul	Male	Psychiatry	62
Balyeidhusa Apollo Simon Peter	Male	Biochemistry	62
Sengooba Asuman	Male	Anatomy	62
Mukungu Fredrick Nathaniel	Male	Info.Science	62
Oyo Benedict	Male	Info.Systems	62
Genza Gyaviira Musoke	Male	Education	62
Katorokire Innocent	Male	Education	62
Rwandembo Wilson Mugisha	Male	Education	62
Tebenkana Timothy	Male	Education	62
Wafula Wycliffe Scot	Male	Education	62
Okello Peter	Male	Educational Mgt,	
		Planning & Admin	62
Ssempebwa Jude	Male	Educational Mgt,	
		Planning & Admin	62
Tusiime Mukwenda Hilary	Male	Educational Mgt,	
		Planning & Admin	62
Kiggundu-Musoke Muhammad	Male	Religious Studies	62
Zinomuhangi Medad Birungi	Male	Religious Studies	62
Kamuruko Tapiwa	Male	Mass-Comm	62
Oriikiriza Celestino	Male	Linguistics	62
Mutambi Mugisha Benon	Male	Economics	62
Okoboi Geofrey	Male	Economics	62

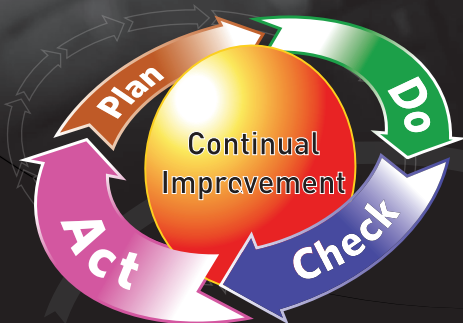


Our Core Values:

1. A global outlook and outreach
2. Breath of vision, creativity and openness to change
3. Collaboration and team work.
4. Excellence and continuous improvement
5. Transparent and courteous internal and external communication in the organization
6. The highest intellectual and ethical standards and;
7. The values of humane and just society; and in realizing Makerere University as an internationally recognized and globally focused, research-intensive institution, with a vigorous learning and teaching environment; the University commits an equivocal commitment to high quality permeating all dimensions of academic activities and support services.

Our mission:

To promote confidence in the quality provision (teaching, research and outreach services) that the quality and the standards of awards of Makerere University are safeguarded, enhanced and effectively managed.



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