MAKERERE UNIVERSITY

COLLEGE OF
NATURAL SCIENCES (CoNAS)

ANNUAL REPORT
2022

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OUR VISION

To be a thought leader of knowledge generation for societal transformation and development

OUR MISSION

To create and impart knowledge in basic and applied sciences to society through training, research and extension services for development

CORE VALUES

The College in pursuit of its mandate is guided by the five core values of Makerere University listed below;

- Accountability
- Profesionalism
- Integrity
- Respect
- Inclusivity

LIST OF ACROYNMS

AR	Academic Registrar
AY	Academic Year
BETB	Bachelor of Science in Ethnobotany
BSBT	Bachelor of Science in Biotechnology
BSC	Bachelor of Science
BSCB	Bachelor of Science in Conservation Biology
BSFA	Bachelor of Science in Fisheries and Aquaculture
BSIC	Bachelor of Science in Industrial Chemistry BSPC Bachelor of Science in Sports Science
BSPG	Bachelor of Science in Petroleum Geosciences and Production
CoNAS	College of Natural Sciences
CoTRA	Collaborative Training in Fisheries & Aquaculture in East, Central and Southern Africa
EU	European Union
ISP	International Science Programme
Mak-RIF	Makerere University-Research and Innovations Fund
MSc.	Master of Science
MUELE	Makerere University E-learning Environment
NORAD	Norwegian Agency for Development Cooperation
ODEL	Open Distance and E-learning
PhD	Doctor of Philosophy
PMB	Plant Sciences, Microbiology and Biotechnology
SBS	School of Biosciences
SPS	School of Physical Sciences
ZEFS	Zoology, Entomology and Fisheries Sciences,

LIST OF TABLES

CONAS LEADERS

Prof. Winston Tumps Ireeta
Principal

Prof. Juma Kasozi
Deputy Principal

DEANS

Prof. Michael Owor
Dean, School of Physical Sciences

Prof. Arthur Tugume
Dean, School of Biosciences

HEADS OF DEPARTMENT

Dr Denis Okello
Head, Dept. of Physics

Dr John Wasswa
Head, Dept. of Chemistry

Prof Godwin Kakuba
Head, Dept. of Mathematics

Dr Arthur Batte
Dept. Geology & Petroleum Studies

Dr Eric Sande
Head Dept of Zoology,
Entomology & Fisherises Sciences

Dr Samuel Ojelel
Head, Dept of Plant Sciences
Microbiology & Biotechnology

Dr Agnes Nandutu M
Head, Dept of Biochemistry
& Sports Science

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FOREWORD

I am delighted to present to you the 2022 Annual Report highlighting several developments at the College of Natural Sciences (CoNAS).

The College continued to register significant achievements in line with the three core functions of the university - teaching and learning, research and innovation and knowledge transfer partnerships. The College presented 17 PhDs at the 72nd graduation ceremony held on 23rd-27th May 2022. Of these, 8 attained a PhD in Mathematics, the highest number of PhD graduates from a single department in the 100-year history of Makerere University. On behalf of the College leadership, I extend our sincere appreciation to SIDA for supporting PhD training through the SIDA Bilateral Programme, 2015-2022, project 316 'Capacity Building in Mathematics and its Applications. Special recognition to all the other development partners who sponsored PhD students, and the graduands who individually sponsored their PhD studies. I commend our academic staff for committing time to ensure our students acquire quality education. This report highlights the efforts by the College through the School of Biosciences to address the challenge of poor performance in Biology at UACE. Our staff at the School of Biosciences working with colleagues at the College of Education and External Studies (CEES) with supervision from the Office of Makerere University Deputy Vice Chancellor in charge of Academic Affairs are undertaking a detailed and carefully planned analysis of – i) the qualifications, competence, and availability of Biology teachers and technicians at A' Level; ii) the scope: breadth and depth of Biology curriculum at A' Level; iii) the state of laboratory and field infrastructure for teaching Biology at A' Level; and iv) the attitude of the of learners/students towards Biology at A' Level. We are hopeful that in the medium to long-term the problems of poor academic performance in Biology at UACE and the ills thereof will be history, just as we solved similar problems that were in Chemistry, Physics and Mathematics at UACE in the 1980's.

The College continues to offer quality education to our students and has over the past year refurbished some of the lecture theatres and laboratories that were in poor state. We have also strengthened practical training and supervision at all levels to ensure we churn out marketable graduates. The College, with support from Makerere University Research and Innovations Fund (MakRIF) commissioned a petroleum field research station in the Albertine Graben to support practical training in petroleum studies. With this facility, we are hopeful that our students will get the required skills to support the development of the petroleum sector in the country. The Renewable Energy Research Group (RERG) at the Department of Physics, CoNAS has for the last 8 years been carrying out training programmes in Solar Photovoltaic Installation and Maintenance, Biogas Production and Solar Thermal Systems. The training programmes are designed to equip participants including our students with competencies and skills needed in the installation and maintenance of solar energy Photovoltaic systems and biogas plants.

In line with research and innovations, the College continues to acquire significant grants to support research and training at the College and University in general. Besides the ongoing grants/projects highlighted in this report, the College received a grant from the US Mission worth US $200,000.00 to strengthen Makerere University's Research, Grant Writing and Publication Capacity. I thank Prof. Fredrick Muyodi for his efforts in securing this grant. Dr. Alice Nabatanzi, a Lecturer in the Department of Plant Sciences, Microbiology and Biotechnology, CoNAS secured the prestigious grant of the Organization for Women in Science for the Developing World (OWSD) worth US$50000. OWSD is creating a network of outstanding women scientists who can provide mentorship and be role models for the next generation of

women leaders in STEM (Science, Technology, Engineering, and Math). This prestigious award is purposed to support Dr. Alice Nabatanzi establish an environment at Makerere University where she can maintain an international standard of scientific research and attract scholars from all over the world to collaborate. CoNAS together with her partners: Botanic Gardens Conservation International (BGCI) UK, Tooro Botanic Gardens (TBG), Entebbe Botanical Garden (EBG) and Grass Roots International won a two-year Darwin Initiative grant (Project Reference: DARNV005) worth £199,995 to execute a project titled; "Understanding Ugandan native plant species' role in innovative sustainable landscapes". Dr Godwin Anywar from the Department of Plant Sciences, Microbiology, and Biotechnology is co-investigator on the project. I applaud all members of staff who work tirelessly to secure grants that are tremendously strengthening training as well as research and innovation at the College. Our members of staff continue to engage in cutting-edge research in the areas of space science, energy technology environmental health, environmental chemistry, plant sciences, microbiology, biotechnology, fisheries sciences, zoology, entomology, geology and petroleum studies as well as mathematics. The College also continues to offer support to various government projects. CoNAS through the Department of Zoology, Entomology and Fisheries Sciences was contracted by the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) to offer training services under the Promoting Environmentally Sustainable Commercial Aquaculture (PESCA) project.

In 2022, several members of staff from the College received awards and international recognition for their contributions in various fields of science. The Swedish International Development Cooperation Agency (SIDA) evaluators declared the SIDA Mathematics Project 2015-2022 under CoNAS the best managed and impactful programme at Makerere University. The programme is coordinated by Prof. John Mango. Dr Perpetra Akite was awarded the Marsh Award for Ecologists in Africa. This prize aims to celebrate the significant scientific achievements of African ecologists and raise their profile in the UK. It is provided by the Marsh Charitable Trust and administered by the British Ecological Society. The International Professional Recognition Council (IPRC) Technical Review Committee granted Prof. Fredrick Jones Muyodi Senior Research Management Professional Status for demonstrating core and transferable research management competencies. Two of the NutriFish-sponsored PhD students, Nakiyende Herbert and Julliet Nafula Ogubi won the awards for the best and second-best oral presentations in the young scientists' category at the International Conference on Artisanal Fisheries and Aquaculture (ICAFA) held in Jinja, Uganda from 1st-3rd September 2022. I congratulate all our staff and students who received awards and recognitions for raising the Makerere flag high. The College also continued to engage in a number of outreach programmes as highlighted in this report.

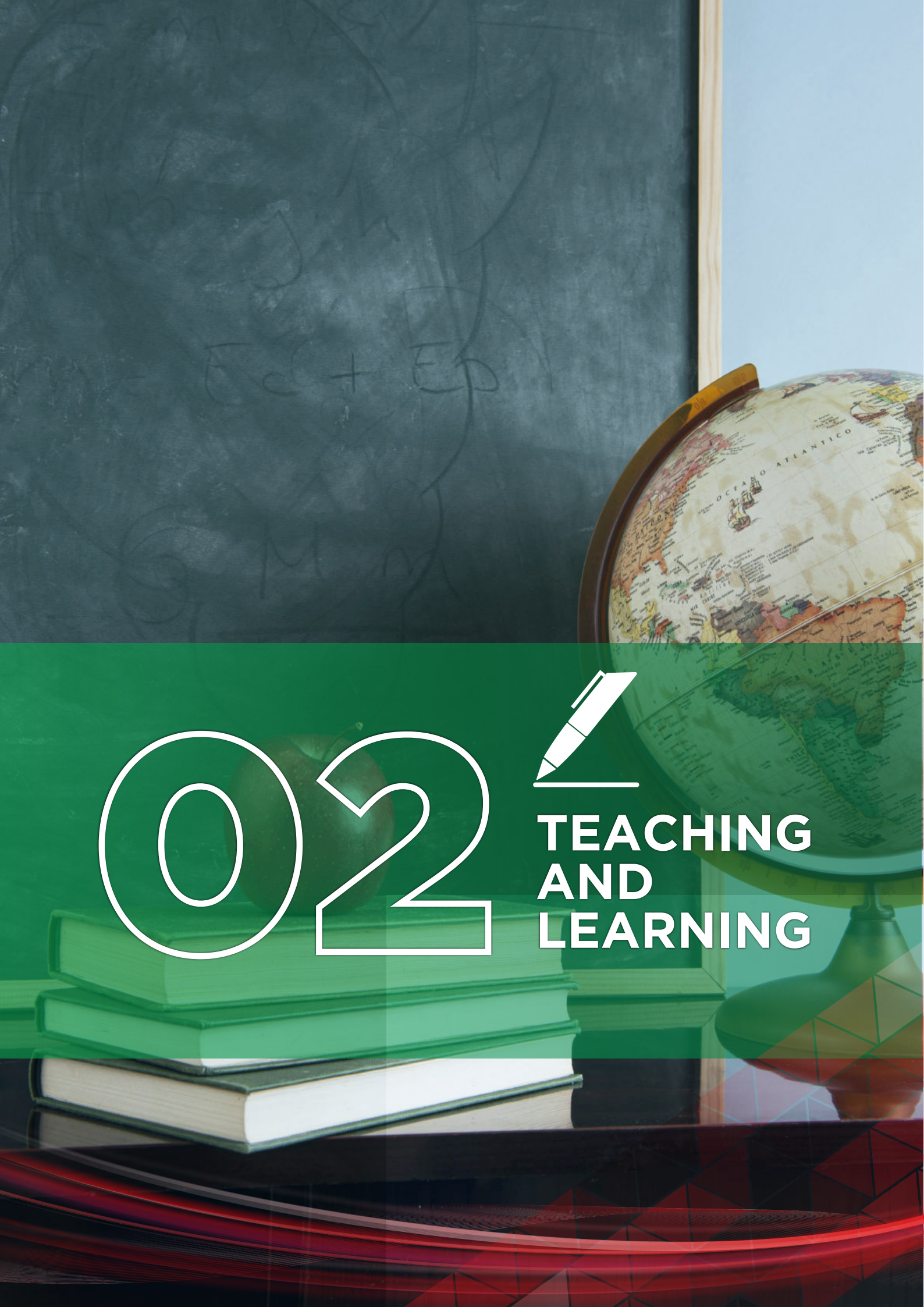
I take this opportunity to once again thank our development partners and the Government of Uganda for the support towards different projects at the College. Through the Makerere University Research and Innovations Fund (MakRIF), the Government is supporting hundreds of research projects at CoNAS and the University in general. I also thank the University Council and Management for creating a conducive environment for both staff and students to explore their full potential. Special appreciation to our members of staff who work tirelessly to ensure we provide quality education to our students. And the students, for diligently committing to their studies.
For God and My Country!

Prof. Winston Tumps Ireeta
Principal, CoNAS

01 OVERVIEW

OVERVIEW

The College of Natural Sciences (CoNAS) is one of the 10 constituent Colleges of Makerere University with over 2000 students and 153 members of staff spread across 2 schools and seven departments namely: School of Physical Sciences (Physics, Chemistry, Mathematics, Geology and Petroleum Studies) and School Biosciences (Departments of Plant Sciences, Microbiology and Biotechnology; Department of Zoology, Entomology and Fisheries Sciences; and Department of Biochemistry and Sports Sciences). The College is the cradle of basic sciences at Makerere University providing a foundation for all applied sciences offered at the University. It offers programmes at undergraduate and graduate level. CoNAS services other Colleges including the College of Health Sciences and College of Veterinary Medicine, Animal Resources and Biosecurity. Staff at the College also teach students from the College of Education and External Studies (CEES), College of Computing and Information Sciences (CoCIS), College of Engineering, Design, Art and Technology (CEDAT), and the School of Statistics and Applied Economics. This report is a presentation of the performance of the College of Natural Sciences in 2022. It covers developments in teaching and learning, research and innovations, community engagements, local and international collaborations, awards and recognitions, and human resource management.



02 TEACHING AND LEARNING

2.1 Admission and Registration

2.1.1 Table 1: 2022/2023 Undergraduate and Graduate Admissions statistics

Programmes	Female	Male	Grand Total
Bachelor of Science	70	111	181
Bachelor of Science (External)	5	21	26
Bachelor of Science in Biotechnology	36	47	83
Bachelor of Science in Conservation Biology	10	25	35
Bachelor of Science in Fisheries and Aquaculture	19	47	66
Bachelor of Science in Industrial Chemistry	44	68	112
Bachelor of Science in Petroleum Geoscience and Production	27	43	70
Bachelor of Sports Science	6	15	21
Doctor of Philosophy (School of Biological Sciences)	1	1	2
Doctor of Philosophy (School of Physical Sciences)	2	1	3
Master of Science in Applied Mathematics	3	8	11
Master of Science in Biochemistry	5	13	18
Master of Science in Botany	1	11	12
Master of Science in Chemistry	5	21	26
Master of Science in Geology	2	3	5
Master of Science in Mathematics	1	6	7
Master of Science in Petroleum Geosciences	1	17	18
Master of Science in Physics	3	12	15
Master of Science in Zoology	13	21	34
Grand Total	**254**	**491**	**745**

2.1.2 Table 2: Registered Undergraduate Students for Semester 1 2022/2023 aggregated by Gender

Programme	Gender / Total	Year I	Year II	Year III	Year IV	Grand Total
BSCI.	**F**	26	36	40	n/a	102
	M	73	68	88	n/a	229
	Total	**99**	**104**	**128**	n/a	**331**
BSIC	**F**	13	22	11	n/a	46
	M	35	42	37	n/a	114
	Total	**48**	**64**	**48**	n/a	**160**
BSFA	**F**	7	8	4	n/a	19
	M	35	32	21	n/a	88
	Total	**42**	**40**	**25**	n/a	107
BETB	**F**	-	-	2	n/a	2
	M	-	-	2	n/a	2
	Total	**-**	**-**	**4**	n/a	**4**
BSPC	**F**	1	1	2	n/a	4
	M	6	8	9	n/a	23
	Total	**7**	**9**	**11**	n/a	**27**
BSCB	**F**	2	6	0	n/a	8
	M	10	17	15	n/a	42
	Total	**12**	**23**	**15**	n/a	**50**
BBPG	**F**	4	16	9	4	33
	M	32	27	31	24	114
	Total	**36**	**43**	**40**	**28**	**147**
BSBT	**F**	12	10	13	n/a	35
	M	26	19	22	n/a	76
	Total	**38**	**29**	**35**	n/a	**102**
Total		**282**	**312**	**306**	**28**	**928**

2.1.3 Table 3: 2022-2023 Semester 2 Enrolment

Programme, Name, and Gender	Year 1	Year 2	Year 3	Year 4	Grand Total
Bachelor of Science	**60**	**90**	**106**		**256**
Female	9	39	25		73
Male	51	51	81		183
Bachelor of Science (External)	**38**	**7**	**11**	**24**	**80**
Female	3	1	1	1	6
Male	35	6	10	23	74
Bachelor of Science in Biotechnology	**18**	**35**	**46**		**99**
Female	3	20	9		32
Male	15	15	37		67
Bachelor of Science in Conservation Biology	**7**	**15**	**17**		**39**
Female	1	5	9		15
Male	6	10	8		24
Bachelor of Science in Fisheries and Aquaculture	**18**	**34**	**31**		**83**
Female	2	10	9		21
Male	16	24	22		62
Bachelor of Science in Industrial Chemistry	**34**	**59**	**53**		**146**
Female	10	30	22		62
Male	24	29	31		84
Bachelor of Science in Petroleum Geoscience and Production	**7**	**38**	**34**	**69**	**148**
Female	2	19	16	17	54
Male	5	19	18	52	94
Bachelor of Sports Science	**9**	**10**	**11**		**30**
Female	2	2	4		8
Male	7	8	7		22

Doctor of Philosophy (School of Biological Sciences)	**3**	**1**	**1**	**1**	**6**
Female	1				1
Male	2	1	1	1	5
Doctor of Philosophy (School of Physical Sciences)	**3**	**2**	**2**	**1**	**8**
Female	1			1	2
Male	2	1	**2**		5
Master of Science in Applied Mathematics	**1**	**1**			**2**
Female	1				1
Male		1			1
Master of Science in Biochemistry	**11**	**7**			**18**
Female	1	2			3
Male	10	5			15
Master of Science in Botany	**2**	**2**			**4**
Female	1	1			2
Male	1	1			2
Master of Science in Chemistry	**11**	**9**			**20**
Female	1	2			3
Male	10	7			17
Master of Science in Geology	**7**	**1**			**8**
Female		1			1
Male	7				7
Master of Science in Mathematics		**1**			**1**
Female		1			1
Master of Science in Petroleum Geosciences	**5**	**3**			**8**
Female	2	1			3
Male	3	2			5

Master of Science in Physics	**6**	**4**			**10**
Female		1			1
Male	6	3			9
Master of Science in Zoology	**13**	**9**			**22**
Female	4	6			10
Male	9	3			12
MSc Applied Mathematics (Biomathematics)	**2**				**2**
Male	2				2
MSc Applied Mathematics (Financial Mathematics)	**1**				**1**
Male	1				1
MSc Applied Mathematics (Mathematical Statistics)	**1**				**1**
Male	1				1
MSc Mathematics (Algebra and Geometry)	**1**				**1**
Male	1				1
Grand Total	**258**	**328**	**312**	**95**	**993**

Some of the BSc graduates

2.2 72nd Graduation statistics – 23rd May 2022

The College of Natural Sciences presented a total of 268 students including 17 PhDs, 22 Masters (4 female, 18 male) and 229 undergraduates (72 female, 157 male). Of these, a total of 5 students (1 female, 4 male) graduated with First Class degrees. Eight students attained PhD in Mathematics, the highest number of PhD graduates from a single department in the 100-year history of Makerere University. The students were sponsored by the SIDA Bilateral Programme, 2015-2022, project 316 'Capacity Building in Mathematics and its Applications. Since 2015, the Project led by Prof. John Mango has sponsored 21 PhD students.

Some of the 17 PhD graduates at the 72nd graduation ceremony

2.2.1 Table 5: 72nd Graduation statistics

No	Programme	Female	Male	Total
1.	PhD	5	12	17
Masters programmes				
1.	Master of Science in Zoology		2	2
2.	Master of Science in Botany	2	3	5
3.	Master of Science in Physics		6	6
4.	Master of Science in Petroleum Geoscience		2	2
5.	Master of Science in Mathematics		1	1
6.	Master of Science in Chemistry	1	3	4
7.	Master of Science in Biochemistry	1	1	2
Undegraduate programmes				
1.	Bachelor of Science in Petroleum Geoscience Production	15	22	37
2.	Bachelor of Science in Industrial Chemistry	21	28	49
3.	Bachelor of Science	25	77	102

4.	Bachelor of Sports Science		4	4
5.	Bachelor of Science in Conservation Biology		11	11
6.	Bachelor of Science in Biotechnology	11	23	34
7	Bachelor of Science in Fisheries and Aquaculture	6	21	27

2.2.2 Table 4: First Class Degrees 2022

Students who graduated with First Class Degrees on 23rd May 2022

No	Name	Gender	Programme	CGPA
1	Oyire Gerald	M	BSc in Petroleum Geoscience Production	4.69
2	Jamwa Brandon	M	BSc in Petroleum Geoscience Production	4.47
3	Busingye Diana	F	BSc in Petroleum Geoscience Production	4.46
4	Okirwoth Jupiter	M	BSc in Petroleum Geoscience Production	4.44
5	Kirumira Dissan	M	BSc in Industrial Chemistry	4.63

2.2.3 Table 6: CoNAS PhDs 2022

A total of 17 candidates were awarded PhDs on the first day 72nd graduation ceremony held on 23rd May 2022 at the University Freedom Square.

No.	Name	Gender	Department	Research topic
1.	Anywar Godwin	M	Department of Plant Sciences, Microbiology and Biotechnology	Ethnopharmacology, cytotoxicity, antiviral and immunomodulatory profiles of medicinal plant species used by herbalists in treating people living with HIV/AIDS in Uganda
2.	Buttimwa Mary	F	Department of Plant Sciences, Microbiology and Biotechnology	"Utilizing Heated Pollen and Androgenesis Pathways for the Production of Haploids in Cassava"
3.	Adaku Christopher	M	Department of Chemistry	Chemical Structure and Properties of Anthocy-anins from Selected Ugandan Plant Species Towards Nutracetical Development

4	Eneku John Paul	M	Department of Chemistry	Optimisation of the electrical resistivity of magnetron sputtered aluminium and boron co-doped zinc oxide thin films for solar cells
5	Inuwa Badamasi	M	Department of Plant Sciences, Microbiology and Biotechnology	Effect of xenoestrogenic substances on fish health and reproductive potential of Nile tilapia, Nile perch and lungfish from two distinctly polluted sites of Lake Victoria: the “more polluted
6	Kito Luliro Silas	M	Department of Mathematics	The Numerical Range of Linear Relations and Stability Theorems
7	Kyomuhangi Annet	F	Department of Mathematics	Reduced Modules Relative to Functors
8	Mayanja Edison	M	Department of Mathematics	Mathematical Models for HIV-HCV Co-infection Dynamics under Various Control Strategies
9	Nabawanda Olivia	F	Department of Mathematics	Flattened Partitions: Pattern Avoidance and Behaviour of Permutation Statistics
10	Nanfuka Mary	F	Department of Mathematics	The use of Splines for solving ill-posed problems, with application to the Cauchy problems for the Heat and Helmholtz equations
11	Nalule Rebecca	F	Department of Mathematics	Hierarchical Models and Spatio-Temporal Processes in Data Analysis

12	Wamono Felix	M	Department of Mathematics	Contributions to reduced rank regression modelling with applications to small area estimation
13	Okello Joseph Omwonylee	M	Department of Mathematics	Limiting Behaviours of the Longest Gaps between Occurrence Epochs in Poisson Processes
14	Mukisa Ambrose	M	Department of Biochemistry and Sports Science	"Role of Blood Lead Levels on the Anemia Status of Uganda's Malaria Infected Children"
15	Ochen William	M	Department of Physics	Measurement and Modelling of Residual Stress in Porcelain Tiles Formulated from Different Quartz Particle Sizes in Uganda
16	Opio Peter	M	Department of Physics	Determination and Analysis of Radiofrequency Intensities from Digital Television Broadcasting Transmitters in Kampala Metropolitan; Uganda
17	Ssenyunzi Richard Cliffe	M	Department of Physics	Modelling Precipitable Water Vapour using Global Navigation Satellite System Data over the East African Tropical Region

2.3 Addressing the National historical problem of poor performance in Biology at UACE

Makerere University through its School of Biosciences in the CoNAS analysed the academic performance in Biology at UACE for nearly half a century. It was observed that since the late 1970s, academic performance in Biology at UACE has never been at its best, and recently, it only deteriorated further to worrying levels as observed almost every year whenever UNEB results are released. Forexample, in the UACE sitting of 2018 whose results were released in February 2019, UNEB statistics show that a total of 13,061 candidates sat for Biology countrywide, and of these only 1 candidate scored an "A". That year, only up to 38% of the candidates scored at least an "E" leaving almost 80% failed (score O or F). In the next year's sitting of 2019, only 44 candidates countrywise scored "A" in Biology. This trend was found quite repeated several times before 2018 and has not improved to-date post COVID-19. The danger is that Biology is crucial because the subject alone accounts for 70-100% of our entire academic and research work in the CoNAS, CHS, COVAB and CAES at Makerere University. This means that poor performance at UACE does not only affect the School of Biosciences in CoNAS; instead, it affects the totality of life-sciences academic and research ecosystem in Makerere University, numerous other essential sectors, and MDAs of Uganda government whose mandates are hinged on Biology. To solve this problem, Makerere University through the School of Biosciences in CoNAS in partnership with CEES under the supervision of the office of the DVC-AA embarked on addressing this grand challenge.

The work will be done in two phases. Phase I will focus on identifying the real root causes of poor performance, by undertaking a detailed and carefully planned analysis of the following:

(i) Qualifications, competence, and availability of Biology teachers and technicians at A' Level;
(ii) The scope: breadth and depth of Biology curriculum at A' Level;
(iii) How topics are segregated or not segregated in different UNEB past papers of Biology at A' Level in comparison to other A' Level subjects;
(iv) The state of laboratory and field infrastructure for teaching Biology at A' Level;
(v) Attitudes of learners/students towards Biology at A' Level.

The results from Phase I will inform steps to be taken in Phase II, which will be mostly actionable steps and recommendation in problem solving. Meanwhile, as part of these efforts, the School of Biosciences in the CoNAS is in advanced stages of creating the "Uganda National Biological Society" (UNBIOS), a non-profit professional association of biologists in Uganda. The society is aimed at (among others things), promoting the professional relevance, motivation of emerging biologists, team building in fostering biology education and scholarship. This demonstrates Makerere University's full determination to solve this challenge. We are hopeful that in the medium to long-term the problems of poor academic performance in Biology at UACE and the ills thereof will be history, just as we solved similar problems that were in Chemistry, Physics and Mathematics at UACE in the 1980's.

2.4 Curriculum Review

The Department of Mathematics is in the process of reviewing all its programmes.

03

RESEARCH & INNOVATIONS

3.1 Research funding

3.1.1 Table 7: Ongoing research projects – MakRIF

No	Project Title	Principal Investigator	Department
1	Using Astronomy and Space Science to Promote Science Education in Schools Influence of Gut Microbiome on Nutritional and Disease status of children in Schistosomiasis endemic region of Albert Nile, Pakwach district	Prof. Florence Mutonyi D'ujanga	Department of Physics
2	Removing barriers to planting of multi-purpose tree species of Uganda Stochastic model for Sustainable Harvesting of Nile tilapia (Oreochromis niloticus) and Nile Perch (Lates niloticus) Fish Populations on Lake Victoria for Optimal Financial Returns and Monitoring	Dr. Julius Mulindwa	Department of Biochemistry and Sports Science
3	Providing Clean and Safe Water to Low-Income Communities using Activated Carbon-Cellulose membrane-based Water filters derived from Disposed Waste	Ibrahim Karume	Department Chemistry
4	Valorisation of Waste Chicken Feathers for Water Purification: Designing and Constructing Low- Cost Keratin Based Nanofilters as Adsorbents of Heavy Metals and Nanosized Contaminants	Dr. Alice Nabatanzi	Plant Sciences, Microbiology, and Biotechnology

5	Providing Clean and Safe Water to Low-Income Communities using Activated Carbon-Cellulose membrane-based Water filters derived from Disposed Waste	Dr. Ibrahim Karume	Department of Chemistry
6	Using the Internet to Incentivize Healthy Lifestyle Choices in Uganda	Dr. Rhona Baingana	Department of Biochemistry and Sports Science
7	Production of Novel Eco-Charcoal Fuel for Urban dwellers using Municipal Vegetative Solid Waste and Volcanic Rocks	Dr. Robert Gumisiriza	Department of Biochemistry and Sports Science
8	Exploring forage resources for stingless bees in Uganda: The case of Meliponula bocandei	Dr. Perpetra Akite	Department of Zoology, Entomology and Fisheries Sciences
9	Grant amount UGX 100,000,000, from Government of Uganda and Makerere University, Research and Innovation Fund -RIF1 Extension, to support soil remediation studies in artisanal and small-scale gold mining areas of Uganda	Dr Emmanuel Tebandeke	Department of Chemistry
10	Production of Novel Eco-Charcoal Fuel for Urban dwellers Using Municipal Vegetative Solid Waste and Volcanic Rocks	Dr Patrick Ssebugere	Department of Chemistry

12	Influence of Gut Microbiome on Nutritional and Disease status of children in Schistosomiasis endemic region of Albert Nile, Pakwach district, Uganda (2021-2022). Funded by the Government of Uganda under Mak-Rif3. Amount UGX 100,000,000	Dr Robert Gumisiriza	Department of Biochemistry & Sports Science
13	Edible Insect Farming for Improved Household Income and Food Security among the Refugees and Host Communities in Northern Uganda. Funded By Gov. Of Uganda/Makrif: 1MSc Student Supported-A Dissertation is under Examination. – Dr Rutaroh Carlmax	Dr Julius Mulindwa	Department of Biochemistry & Sports Science
14	Biomethane Production from Biomass-Matooke Peels for Sustainable Energy – Total funding - UGX 74,791,000. Partner - International Fertilizer Development Center Alloimmunization and Vascular Thrombosis In Sickle Cell Disease (avart Scd) UGX98,000,000	– Dr Rutaro Karlmax	Department of Biochemistry & Sports Science
15	Development of bacterial systems for the production of industrial enzymes: proteases and levansucrase. UGX 104,575,57	Dr Patrick Ssebugere	Department of Chemis-try

16.	Alloimmunization and Vascular Thrombosis In Sickle Cell Disease (avart Scd) UGX98,000,000	Dr Dennis Kasozi	Department of Biochemistry and Sports Science
17.	Development of bacterial systems for the production of industrial enzymes: proteases and levansucrase. UGX 104,575,57	Dr Apollo Simon Peter Balyeidhusa, Co-PI: Dr Joseph Fuuna Hawumba Research Scientists: Dr Samuel Wasibala Wamutu; Robert Dr Gumisiriza & Dr Moses Okol	Department of Biochemistry and Sports Science
18.	Presenting new approaches to the teaching & learning of Mathematics - UGX169,180,000	Dr David Ssevviiri	Department of Mathematics
19. .	Positioning Mathematics as a Tool for Sustainable Fisheries Management: A Mathematical Model for Fish Stock Assessment in LakeVictoria. UGX49,992,000	Dr Nathan Muyinda	Department of Mathematics
20.	Practicals to the Home for a Rural Student. Makerere University Research and Innovation Fund 4 (Government of Uganda). Budget -UGX166,720,000	Dr Taddeo Ssenyonga	Department of Physics
21.	Building a Laboratory System for Quality Checks of Solar Panels in Uganda. Makerere University Research and Innovation Fund 2. Budget - UGX156,010,000	Winston T. Ireeta	Department of Physics

22	Solar Power; Training for Change, Transforming Skills and Attitudes Among Rural Communities in Northern Uganda. Makerere University Research and Innovation Fund 2 (Government of Uganda). Budget - UGX-154,313,000	Willy Okullo	Department of Physics
23	Practicals to the Home for a Rural Student. Makerere University Research and Innovation Fund 1 (Government of Uganda). Budget UGX209,720,000	Taddeo Ssenyonga	Department of Physics

3.1.2 Table 8: Projects supported by International Partners

No	Project Title	Purpose	Duration	Principal Investigator
1	African Water Resource Mobility Network (AWARMN)	Makerere University in collaboration with Rhodes University, South Africa; University of Technology, Nigeria; Higher School of Hydraulics, Algeria; Delfts University, Netherlands and University of Kinshasa, DR Congo, are implementing a project to address water-related pressing needs on the African continent worth EUROs 139,000,000 funded by European Union Commission. The grant was awarded under the Intra-Africa Academic Mobility Scheme. The project is intended to support both African scholars for PhD and MSc	2020-2024	Assoc. Prof. George William Nyakairu, Department of Chemistry

2	Bee Pollinators Diversity Informatics Project	The Department of Zoology, Entomology and Fisheries Sciences in collaboration with DICTS-Makerere University, National Museum of Kenya, Metalmark Web and Data (USA), Bee Identification Services (USA), Belgian Museum of Natural History; won a research grant worth USD275,000 funded by JRS Foundation. Objectives: 1) Enable access to biodiversity data through the development and launch of a database-driven website on bees of Uganda and related pollination information. 2) Expand the knowledge base on bee pollinators by engaging farmers and government agencies, conducting field surveys and sampling events to collect specimens. 3) Analysis of datasets with a focus on bee diversity, determinants of distribution, and bee-plant mutualisms in agricultural landscapes of the Southern Kyoga Basin and Central Lake Victoria Crescent. 4) Enhance capacity at Makerere University through the development of a bee genera of Uganda identification guide and training in bee identification skills and biodiversity informatics applications	2020 - 2022	Assoc. Professor Anne Akol, Department of Zoology, Entomology and Fisheries Sciences
3	Environmental Health	Makerere University in partnership with Helmholtz Zentrum München, Germany won a research grant of USD 36,079 funded by the World Academy of Sciences to undertake a research on Environmental Health	2020 – 2022	Dr. Patrick Ssebugere, staff from the Department of Chemistry
4	Capacity building in Environmental Sciences	Makerere University in partnership with Slovak University of Technology, Bratislava, is training MSc. And PhD scholars supported by a research grant from ICM Erasmus+	2020 - 2023	Dr. Patrick Ssebugere, staff from the Department of Chemistry

5	Environmental Chemistry for Sustainable Development	Makerere University with financial support of € 373,050.15 from the Austrian Partnership Programme in Higher Education and Research for Development is implementing a three-year project on Environmental Chemistry for Sustainable Development. Partners are: University of Natural Resources and Applied Life Sciences, Austria; Jaramogi Oginga Odinga University of Science and Technology, Kenya	2020 - 2024	Dr. Patrick Ssebugere, staff from the Department of Chemistry
6	Mathematics for Sustainable Development	Makerere University in collaboration with University of Bergen, Norway and University of Dar es Salaam, Tanzania won a grant of NOK19,900,000 to train five (5) PhDs at Makerere University and six (6) PhDs at University of Dar es Salaam between 2021-2026	2021 - 2026	ssoc. Professor John M. Mango, Department of Mathematics
7	SIDA grant of 39M SEK (approx. USD 4.5m) to Capacity building in Mathematics and its Applications	Capacity building in Mathematics and its Applications	2015-2022	Assoc. Professor John M. Mango, Department of Mathematics
8	Energy Technology Network (EnergyNET)	EnergyNET project is funded by the Norwegian Agency for Development Cooperation (NORAD) under NORHED II. "The project is a network of African universities collaborating on education and research in Energy Technology. EnergyNET project is coordinated by NTNU-Trondheim and the project partners are: University of Dar es Salaam (Tanzania), Makerere University (Uganda), Mekelle University (Ethiopia), Addis Ababa University (Ethiopia) and Eduardo Mondlane University (Mozambique	2021-2026	Dr. Karidewa Nyeinga, the Department of Physics

9	University Network on Energy Technology (UNET)	UNET is co-funded by the Erasmus + Program of the European Union. "The main objectives of UNET include: Jointly develop PhD courses in support of the existing PhD programs in energy at the partner universities; Improve on specialized facilities at each university to offer Training Sites for PhD researchers; Conduct a pilot phase with PhD candidates benefiting from the Course Catalogue and the Training Sites.	2021-2023	Dr. Karidewa Nyeinga, Department of Physics
10	Collaborative Training in Fisheries and Aquaculture in East, Central and Southern Africa (COTRA)	Makerere University in partnership with the University of Rhodes, South Africa; University of Eldoret, Kenya; Mzuzu University, Malawi; Bukavu University, DRC and BOKU University, Austria are implementing an Intra-Africa Mobility Scheme funded by European Union Commission worth EUROS1,399,875. The project supports training of PhD and MSc. Scholars at the partner universities.	2018-2022	Dr. Peter Akoll, Department of Zoology, Entomology and Fisheries Sciences
11	Dry Rifting in the Albertine Rhino (DRIAR) Project	Makerere University is collaborating with the US universities including Virginia Tech and University of Kansas to conduct research in the Albertine Graben under the Dry Rifting in the Albertine Rhino (DRIAR) Project. The DRIAR Project involves a geophysical, geochemical, geological, and geodynamic investigation of the Albertine-Rhino Graben in western and northwestern Uganda to improve understanding of continenta rifting in areas where volcanic activity is minimal. Several field activities are being carried out. These activities include collecting water samples, collecting rock samples, temporary deployment of seismic, magnetotellunc, and gravity instruments, permanent installations or Global Navigation Satellite System (GNSS) instruments,	2021-2025	Dr. J.M. Kiberu, Department of Geology and Petroleum Studies

		temporary deployment of GNSS instruments at specific locations, and geological mapping. PhD students include Mr. Hillary Mwongyera and Ms. Asenath Kwagalakwe.		
12	Access to Benefit Sharing-Sustainable use of Biodiversity (ABSBIO):	Makerere University in partnership with Leipzig University, Germany and IRGIB Africa University, Benin won a grant funded by DAAD. The grant supports entrepreneurship through use of biodiversity.	2019 - 2022	Prof. Eseza Kakudidi, Dr. Patience Tugume and Mr. Godwin Anywar, Department of Plant Sciences, Microbiology and Biotechnology
13	ISP Grant of 313,590 SEK to EAUMP Southern Africa (COTRA)	Eastern Africa Universities Mathematics Programme (EAUMP) - objectives of the network are: Enhancement of postgraduate training with special emphasis to PhD training; Establishing and strengthening collaborative research in Mathematics areas of interest in the region; Strengthening the collaborating Mathematics departments in terms of equipment and literature; Development of resources for the collaborating Mathematics Departments; Postdoctoral training of academic staff	2022 - 2024	Dr Juma Kasozi, Department of Mathematics
14	ISP Grant of 539,000 SEK to EAALG	Eastern Africa Algebra Research Group (EAALG)	2021 - 2022	PI- D. Ssevviiri – Department of Mathematics

15	IST Grant of 598,000 SEK -	Grant to support women in Mathematics and Gender Outreach Activities		Dr B. K. Nannyonga, Department of Mathematics
16	Dispersal of Antibiotic Resistance and antibiotics in Water ecosystems and Influence on livestock and aquatic wildlife (PAIRWISE)"	The project is funded by Swedish International Development Agency (Sida), in partnership with: The European Union - Horizon 2020 Framework Programme Aquatic Pollutants, Joint Programming Initiative on Anti-microbial Resistance (JPIAMR), www.waterjpi.eu; and JPI Oceans - www.jpi-oceans.eu Grant amount: USD 285,000	September 2021- August 2023	The Makerere University PI. is Assoc. Prof. Charles Masembe, Assisted by Dr. Robinson Odong
17	PESCA project	Provision of training services to the PESCA project	March 2022- 2023	Team Leader - Dr Jackson Efitre, Department of Zoology, Entomology and Fisheries Sciences
18	Understanding cell to cell heterogeneity in African trypanosome field isolates	Funded by DFG (German Research Fund), Project No. 444811942; Amount Eur 179,735	2023- 2025	Dr Julius Mulindwa - Department of Biochemistry and Sports Science
19	Value Chain Hygiene Practices And Microbial Contamination Of Street And Market Vended Ready-To-Eat Grasshoppers, Ruspolia Spp. In Uganda.	Funded by International foundation for Science (IFS). Output-Manuscript submitted.	2021-2023	Dr Rutaro Karlmax - Department of Biochemistry and Sports Science

20	Project title: Towards a Research-led University: Strengthening Makerere University's Research, Grant Writing and Publication Capacity. Partners: Michigan State University, Michigan, USA	Funders: US Mission, USA. Funding Amount: US $200,000.00	01/10/2022 to 31/09/2023	PI: Fredrick Jones Muyodi, Makerere University.
21				

3.1.3 Workshop Funding

1	Foundation Composition support of EUR 3,000 towards EAALG Workshop –Coordinated by the PI, Dr David Ssevviiri
2	IMU-CDC support of EUR 3,000 towards Eastern Africa Algebra Research Group (EAALG) December 2022 workshop coordinated by the PI, Dr David Ssevviiri
3	Support from European Mathematical Society (EMS), CDC of EUR 4,000 towards a visit to Makerere University of 2 PhD students from Addis Ababa University, Ethiopia. The students are co-supervised by Dr David Ssevviiri, Dr Tilahun and Dr NegaArega.
4	IMU-GRAID support of USD 1,750 for one PhD student. Applicant: Dr David Ssevviiri Abram Gannibal project support of GBP 8,390 towards a research visit to Glasgow University by Dr David Ssevviiri

3.1.4 Research grants

i) Dr Alice Nabatanzi Wins US $50000 OWSD Prestigious Award

Dr Alice Nabatanzi

The Organization for Women in Science for the Developing World (OWSD) is an international organization founded in 1987 and based at the offices of The World Academy of Sciences (TWAS), in Trieste, Italy. OWSD is the first international forum to unite eminent women scientists from the developing and developed worlds with the objective of strengthening their role in the development process and promoting their representation in scientific and technological leadership. OWSD is creating a network of outstanding women scientists who can provide mentorship and be role models for the next generation of women leaders in STEM (Science, Technology, Engineering, and Math). This prestigious award is purposed to support Dr. Alice Nabatanzi establish an environment at Makerere University where she can maintain an international standard of scientific research and attract scholars from all over the world to collaborate. Dr. Nabatanzi, a Lecturer in the Department of Plant Sciences, Microbiology and Biotechnology, College of Natural Sciences (CoNAS), Makerere University is enthusiastic about partaking society changing research, especially the burden of non-communicable diseases in African societies in addition to nutritional deficiencies among the vulnerable marginalized groups (pregnant women, school-going children, people living with HIV/AIDS, and the elderly).

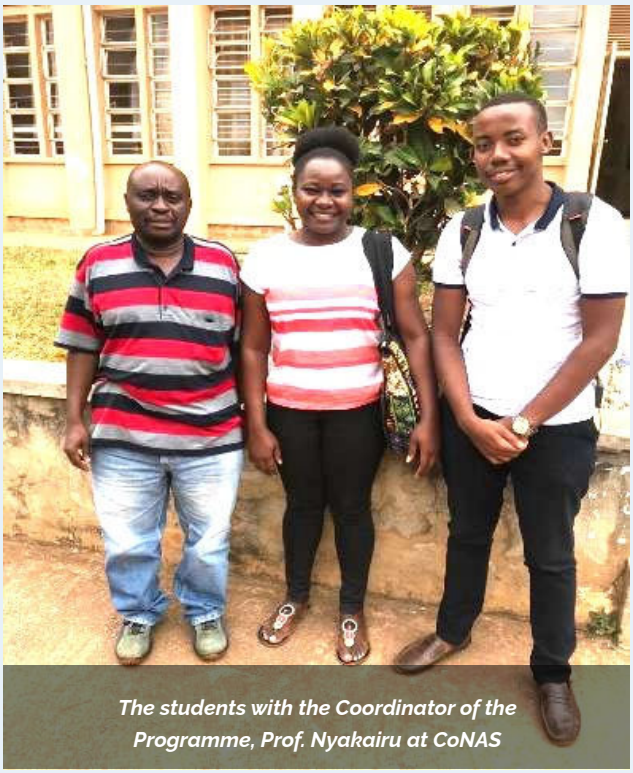
ii) Research grant - Mak-CoNAS & Partners Win Grant to Support Research on Ugandan Native Plant Species

The College of Natural Sciences (CoNAS), Makerere University with her partners: Botanic Gardens Conservation International (BGCI) UK, Tooro Botanic Gardens (TBG), Entebbe Botanical Garden (EBG) and Grass Roots International won a two-year Darwin Initiative grant (Project Reference: DARNV005) worth £199,995 to execute a project titled; “Understanding Ugandan native plant species’ role in innovative sustainable landscapes”. The role of Makerere University in the project will mainly be to identify and select promising wild food plants for value addition by conducting nutritional analyses. Dr Godwin Anywar from the Department of Plant Sciences, Microbiology and Biotechnology at CoNAS is the Co-investigator and Project Leader for Makerere University.

Dr Godwin Anywar
The Co-investigator and Project Leader at Makerere University

iii) CAG University MA scholarships

Three students obtained MA fellowships on the Makerere University-CAG University partnership coordinated by Prof. Nyakairu. Two of the students, Davis Twinamatsiko and Frances Athieno from COBAMS are supervised by Prof. G. Akileng and Dr. Wanyama. The programme is funded by Erasmus+ Programme under ICM /Erasmus+ KA 107 project. The programme supports students and staff in the frame of International Credit Mobility / KA107 * Cooperation on academic and cultural research. The Erasmus+ Programme aims at promoting equity and inclusion by facilitating access to participants with disadvantaged backgrounds and fewer opportunities compared to their peers. It is expected that upon graduation scholarship beneficiaries can proactively contribute towards socio—economic transformation of their communities.



The students with the Coordinator of the Programme, Prof. Nyakairu at CoNAS

3.1.5 Research dissemination

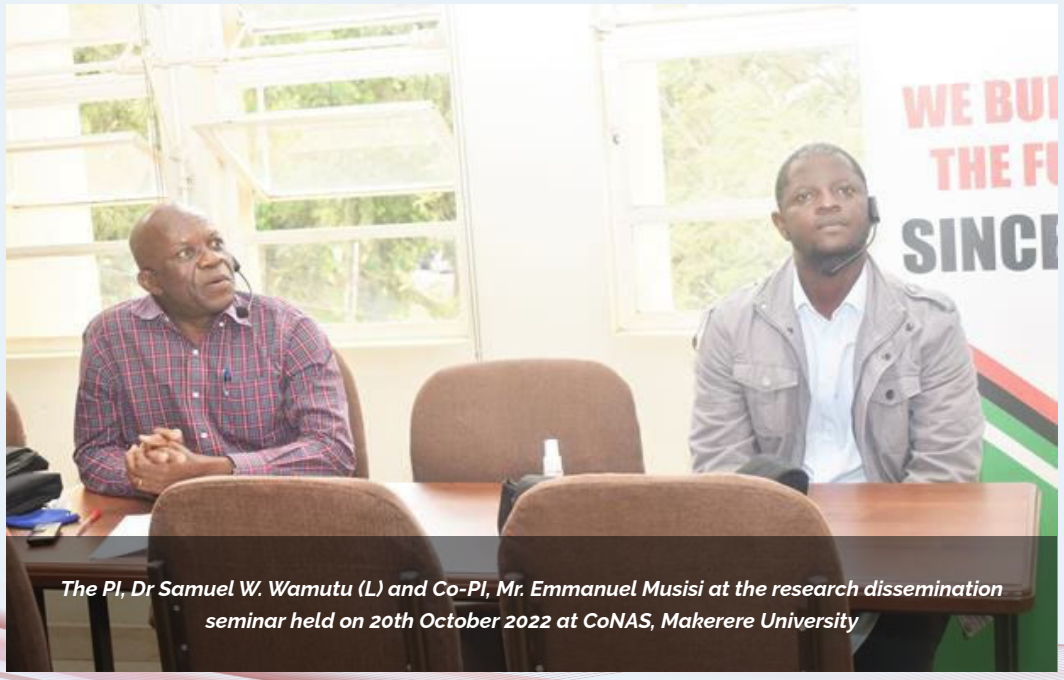
i) CoNAS Research Dissemination: Stochastic Model for Sustainable Fish Harvesting on L. Victoria

The Lake Victoria Nile Perch (NP) fishery (fishing and post-harvest activities) is a significant contributor to the social and economic development of the Lake Victoria Fisheries Organization (LVFO) Partner States (Kenya, Tanzania and Uganda). The catch of NP has averaged 250,000 tonnes per annum for the last two decades. During the last decade, the fishery has faced serious problems of overcapitalisation and overfishing and high levels of non-compliance to regulations in the fishing and post-harvest sub-sectors. This has led to decreasing stock health resulting in an increased vulnerability of the resource base and suboptimal contribution of the fishery to the lake-side economies (EAC LVFO Nile Perch Fisheries Management Plan, 2015-2019). The challenges are not unique to Nile Perch. The main challenge currently facing Lake Victoria is how to sustain the Nile perch and Nile tilapia and how to conserve and restore threatened fish species. In August 2021, researchers from the College of Natural Sciences (CoNAS) won a grant in Round 3 of the Makerere University Research and Innovations Fund (Mak-RIF) to investigate the optimal fish harvest problem for Nile Tilapia and Nile Perch in Lake Victoria. Under a project titled; "Stochastic Model for Sustainable Harvesting of Nile Tilapia (Oreochromis niloticus) and Nile Perch (Lates niloticus) Fish Populations on Lake Victoria for Optimal Financial Returns and Monitoring", the research team aimed to formulate a stochastic model for harvesting Nile tilapia and Nile perch fish species on the Uganda waters of Lake Victoria that will ensure sustainability and optimal returns from the harvest. The project was led by Prof. Juma Kasozi from the Department of Mathematics. Other members included, Prof. Betty K. Nannyonga, Prof. John Mango, Dr Juliet Nattabi Kigongo, Dr Fred Mayambala, and Ms. Stella Mbabazi from the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF). On 14th September 2022, the project team disseminated the research findings to stakeholders in the fisheries industry. The research was funded by the Government of Uganda through the Makerere University Research and Innovations Fund (Mak-RIF).

Left: The Project Principal Investigator, Prof. Juma Kasozi. Right: Dr Fred Mayambala disseminating the research results

ii) TB-MBLA A More Accurate TB Pre-treatment Diagnostic Tool – Mak Researchers

Rapid and accurate detection of TB is key for guiding effective treatment. To date, the global and national TB case detection, treatment success and case notification rates remain lower than the expected targets under the Sustainable Development Goals (SDGs) partly because of the less effective diagnostic tools currently in use. Smear microscopy, the commonest TB test is highly subjective, less sensitive and is not ideal for monitoring treatment response. GeneXpert Ultra is the current standard of care for TB, as the test is highly sensitive, rapid and even detects rifampicin resistance TB. However, it is heat and dust sensitive, leading to high instrument failure rates. GeneXpert cannot be used to monitor treatment response because it also detects DNA from dead Mtb cells, besides live cells. Sputum culture, despite being gold standard TB test, is prone to contamination and high turnaround time. Moreover, the presence of non-culturable but viable Mtb often leads to false negative results. Thus, alternative, rapid and accurate diagnostic tests that are easy to use in high TB burden countries such as Uganda are urgently needed to improve TB case detection, treatment success, and case notification rates. With funding from the Government of Uganda through Makerere University Research and Innovations Fund (MakRIF), and the University of St Andrews (UK), researchers from the College of Natural Sciences (CoNAS), Makerere University, led by Dr Samuel W. Wamutu investigated the diagnostic accuracy of the TB-Molecular Bacterial Load Assay (TB-MBLA) among presumptive TB adult patients in Uganda. TB-MBLA tool is a novel, 16srRNA-based test with potential to accurately detect and quantify TB in clinical samples, thereby providing an advantage of diagnosing and monitoring anti-TB treatment response. The research was conducted under a project titled "Evaluating the Accuracy of Molecular Bacterial Load Assay to Detect Mycobacterium Tuberculosis and Monitor Treatment Response to Anti-tuberculosis Therapy in Uganda". On 20th October 2022, the project team led by Dr Samuel W. Wamutu and Mr Emmanuel Musisi (Co-PI and PhD candidate at the University of St. Andrews, UK) disseminated the research findings to stakeholders including representatives from the health sector. During their presentation, the researchers noted that the project had greatly supported capacity building through training of skilled workforce, renovation of the TB Clinic Office floors at Naguru Referral Hospital, repair of the freezer and air conditioner at the same hospital, improvement of knowledge of molecular microbiology and TB diagnosis, and strengthening collaborations with institutions including IDRC and MakBRC.



The PI, Dr Samuel W. Wamutu (L) and Co-PI, Mr. Emmanuel Musisi at the research dissemination seminar held on 20th October 2022 at CoNAS, Makerere University

FEATURE NN 43
Thursday, October 13, 2022

MAKERERE UNIVERSITY PROJECT TO ADDRESS CLIMATIC CHALLENGES

By Umar Nsubuga

Makerere University has innovated a research-based, in-time technology project to predict the rains in the cattle corridor to address the main challenge of farmers in the dry pastureland.

The project, known as Knowledge and Information through Appropriate Technologies (TWIGA), accesses, observes and correlates geo-services in Africa, to predict weather information.

Prof. John Kaddu, the principal investigator at Makerere University College of Natural Sciences, said this is done by transforming water, weather and climate information through in situ observations in Africa, using a combination of data from different sensors, which include global navigation satellite system (GNSS), global earth observation system of systems (GEOSS) and Copernicus or the belief that the earth rotates daily on its axis and the planets revolve in orbits around the sun.

While training farmers from Kalungi and Lwabiyata sub-counties at the district headquarters in Nakasongola recently, Prof. Kaddu said the project is being undertaken by a consortium of 16 implementing institutions from Africa and Europe. These comprise research organisations, small and medium-sized enterprises, government organisations and academia.

Officials from Makerere university, Nakasongola leaders and farmers pose for a group photo after attending the training recently

"We use a network of 500 ground weather stations in Africa, providing ready-to-use technical infrastructure. The project obtains research-based information on weather, water and climate and informs stakeholders across different sectors, such as agriculture, insurance and disaster response and management," he said.

Over the years, the cattle corridor has been characterised by several climatic challenges resulting from overgrazing and unsustainable land use. This has further led to low productivity, which is worsened by frequent prolonged dry spells in most parts of the country. Challenges of crop failure, famine and inability to generate gainful income have been reported among many households.

Leaders pledged to link the project beneficiaries with government programmes such as the Parish Development Model.

David Waliggo, a resident of Kalungi village in Wazzogi parish, Kalungi sub-county in Nakasongola district has grown beans and maize for the past six years. However, one of his main challenges has been the unpredictable weather. Farmers still generally determine their planting seasons basing on the rainy seasons.

"Initially, we used to successfully predict seasons, but everything has changed. Seasons keep changing and forecasting weather is very difficult. The radios can't help because one is told to expect sunshine on a particular day, only for it to rain in the evening," he said.

Prof. Kaddu said the cattle corridor land productivity can be improved using integrated approaches that include effective weather information, which is vital in crop production.

"It helps farmers build the capacity to own information. We intend to teach farmers to examine how innovations can empower smallholder farmers and the entire value chain that supports them, through the use of information and communication technologies. Using technology to access information can help control some of the challenges, especially climate change," he said.

The TWIGA project carries out its activities in eight work pacages and Makerere University is involved in four work packages, which feed into the wider TWIGA project objectives.

Prof. Florence D'ujanga, one of the team leaders on the project, said the rainfall predictability and assessment is improved by monitoring and mapping integrated perceptible water vapour and tracking convective storm systems.

TRANSFORMING WEATHER WATER DATA FOR SUSTAINABLE GROWTH

To enhance the prediction of heavy rains, in situ low-cost GNSS sensors are synergistically used with satellite-based Sentinel SAR images and NWP models to monitor the tropospheric water vapour spatial and temporal distribution.

"We train local farmers on how much water can precipitate. The biggest problem is that prediction of rainfall forecasts has been dismal and there is also a lack of knowledge of the perceptible water vapour in the atmosphere," D'ujanga said.

The project has partnered with the Uganda National Meteorological Authority (UNMA) so that the GNSS receivers are co-located with the UNMA.

Milton Wasiwa, who works with UNMA, said many farmers suffer losses, owing to limited information flow. He appreciated the TWIGA project, saying this will reignite the love for farming, which should be a professional and profitable business venture worth investing in.

"The majority of farmers who have worked with TWIGA have realised a considerable harvest, including seasons when the weather is harsh," Wasiwa said.

BENEFITS

The benefits from the technologies are evident as many households are realising better harvest, even amidst a grand failure of crops countrywide. The households are, therefore, able to cope easily with the problem of food insecurity that is rampant in most parts of the district.

Many households neighbouring the model groups are now adopting the technologies as one of the ways to develop resilience against the weather vagaries presented by climate change.

The leaders called on the local communities to replicate these technologies as a strategy for ensuring food security amidst the growing climate change problems.

Makerere University experts have continued to raise awareness about the technologies and to strengthen support for local extension. The leaders also pledged to link the project beneficiaries with government programmes such as the Parish Development Model to leverage the efforts.

Nicholas Olango, an agricultural scientist in the project, said at the end of the project, many farmers would have the knowledge and will teach and sensitise others.

WHAT TRAINED FARMERS SAY

Margaret Namuddu, a resident and farmer in Kalungi sub-county, said there was a difference between the past and after training. She joined the TWIGA project after the previous season was so bad and most farmers did not harvest anything.

"After I received training from TWIGA, my garden was green throughout the dry spell and the harvest was not affected. Those who haven't joined have been asking me what I did to realise this harvest amidst the dry season," Namuddu said.

Henry Simbwa, another farmer, praised TWIGA, saying the technology helped him produce enough food to feed his family and to sell off the surplus.

Herbert Mululu, another resident, said farmers must change their methodology if they are to realise increased yields.

"As farmers, although we have knowledge that is relevant to help each other, we need new technology to connect in a way that is convenient and cost-effective.

Therefore, if TWIGA has launched this initiative, let us support Makerere University experts to make it work ," he said.

HOW THE PROJECT SYSTEM WORKS

Dr Eric Sande, the head of the department of zoology, entomology and fisheries sciences at Makerere University, said the satellite sends data to the computer and avails actionable information to the national system. After that sensor in automatic weather stations, it will communicate weather parameters.

However, technology can address some of these challenges by helping farmers access crucial weather information, which can improve their agricultural products. To help such farmers, Sande said the Makerere University project provides training on good agronomic practices and plant stress management, including pest and disease control.

Additionally, using a combination of data from different sensors, which include GNSS, GEOSS and Copernicus, improves accuracy.

Nicholas Olango, an agricultural scientist in the project, said another key work package is monitoring vegetation in general and crop development in particular, to produce accurate maps of land cover, land use, and crop status.

This is being implemented among other ways through collaboration with local farmers, also known as citizen scientists. The local farmers were given training on accurate identification of plant stress and the use of smartphones to report their crop management.

Olango said GNSS data is collected from low-cost single/dual-frequency receivers; low-cost sensors can be profitably exploited in Africa where geodetic GNSS networks are missing.

SAR data is collected from the Copernicus - Sentinel 1A/B mission.

The high cost of geodetic GNSS sensors has prevented an evenly distributed deployment around the globe.

Sande said TWIGA aims at providing the unavailable geo-information on weather, water and climate for sub-Saharan Africa. The project will enhance satellite-based geo-data with innovative in situ sensors and will develop related information services that answer the needs of African stakeholders and the GEOSS community.

3.1.6 Research collaboration

i) College of Agriculture and Life Sciences, Virginia Tech, USA

A team from the College of Agriculture and Life Sciences, Virginia Tech, USA on 16th June 2022 visited the College of Natural Sciences to explore potential areas for collaboration. The team toured and was impressed by the projects at the College.

Dr Godwin Anywar briefing the team on his therapeutics and Nutraceutics project

ii) International Institute of Physics (IOP) seeks collaboration with the CoNAS

The Head of International Relations at the Institute of Physics (IOP) in the UK, Mr Dominic Hurley, and International Relations Manager at the same institute, Ms Linsey Simkin on 7th July 2022 visited the College of Natural Sciences, (CoNAS) to establish potential areas for collaboration. They held meetings with the Principal and Head, Department of Physics. They also interacted with staff from the Department of Physics and paid a courtesy call on the Vice Chancellor represented by the Deputy Vice Chancellor in charge of Academic Affairs, Prof. Umar Kakumba. The visitors toured some facilities at the Department of Physics and will continue engaging the College Management on potential areas of collaboration. The Institute of Physics (IOP) is a professional body and learned society for physics in the UK and Ireland, with an active role in promoting co-operation in physics around the world.

The DVCAA, Prof. Umar Kakumba (L) in a meeting with the visitors from IOP, Mr. Dominic Hurley (R) and Ms. Linsey Simkin (2nd R) as well as the Principal CoNAS, Prof. Winston Tumps Ireeta, and the Deputy Principal, Prof. Juma Kasozi

04 ACTIVITIES

4.1 College level activities

4.1.1 First Year Students' Orientation

On 2nd February 2022, CoNAS held an orientation for all First Year students. The students were sensitized on the different programmes at the College and the University policies and services.

On 20th October 2022, the College held an orientation for First Year students - Academic Year 2022/2023. Led by the Principal, Prof. Winston T. Ireeta, the College Managers welcomed and briefed the students on the requirements for each study programme

4.1.2 CoNAS engagement with the Mak Endowment Fund

The Makerere University Endowment Fund Board of Trustees appreciates the centrality of engaging Constituent Colleges in its pursuits to contribute to the financial sustainability of Makerere. Consequently, members of the Board led by Dr Maggie B. Kigozi in 2022 met Principals to explore mechanisms of bringing on board all Colleges to establish an Endowment Fund, and generally contribute to the realization of the objectives of the University Endowment Fund. The Board met with the former Principal of CoNAS, Prof. J.Y.T Mugisha and deliberated on ways of establishing an Endowment Fund at the College.

The former Principal of CoNAS, Prof. J.Y.T. Mugisha meeting with the team from the Endowment Fund

4.1.3 CoNAS contributes towards Mak@100 celebrations

The Principal, College of Natural Sciences (CoNAS), Prof. Winston Tumps Ireeta on 7th June 2022 handed over to the Vice Chancellor, Prof. Barnabas Nawangwe UGX-6,384,215 million, staff cash contribution towards Makerere University centennial celebrations. Having opened its doors to 14 day students in 1922, Makerere has grown to become one of the most prestigious Universities in Africa. The University marked 100 years of existence on 8th October 2022.

The Principal of CoNAS, Prof. Winston Tumps Ireeta (L) hands over the cash contribution to the Vice Chancellor, Prof. Barnabas Nawangwe

The Deputy Principal of CoNAS, Prof. Juma Kasozi (R) and Prof. Florence D'ujanga (L) with the Vice Chancellor. Prof. Kasozi and Prof. D'ujanga led the fundraising drive for Mak@100 at the College of Natural Sciences

4.1.4 International Day for Women and Girls in Science

Makerere University College of Natural Sciences (CoNAS) in collaboration with the Organization for Women in Science for the Developing World (OWSD) Uganda National Chapter hosted the celebrations to mark the International Day for Women and Girls in Science. The celebrations took place on 11th February 2022 under the theme: "Career Advancement Challenges, Opportunities, and Experiences of Women and Girls in Sciences and Leadership in Uganda"

4.1.5 CoNAS students participate in National Science Week Exhibition

CoNAS students participated in the 2022 National Science Week exhibition at Kololo Independence Grounds. The exhibition took place on 6th-10th November 2022 under the theme "Uganda 2040; The Future We want through Science, Technology and Innovation." The National Science Week Exhibition provides a platform to showcase innovations and technologies across all sectors that are steering the country towards achieving the national development goals and fighting poverty. In 2022, the National Science Week Exhibition focused on Aeronautics and Space Science, Mobility (Indigenous Motor Vehicle Industry), Pathogen Economy, Industry 4.0+, Infrastructure Innovations, Productivity Acceleration, Import Substitution, and Export Targeted Science, Technology & Innovation. On the sidelines of the event, innovations of relevant support services that were invented to catapult the science-led socio-economic transformation, as cast in vision 2040 were showcased.

4.1.6 CoNAS participation in the exhibition

Like other participants, CoNAS students presented projects to the Ministry of Science, Technology and Innovation, and following a rigorous selection process, four groups succeeded to showcase their projects under two categories – Pathogen Economy and Industry 4.0+.

CoNAS Students' Projects/Innovations;

i) An evaluation of phytochemical and analgesic properties of a traditional medicinal plant popularly used in Northern Uganda as a topical application for pain relief and management. Project team – Alum Sheryl Dinymoi, Adokorach Prossy, Amuge Sheila Marion (Department of Plant Sciences, Microbiology, and Biotechnology) – participating under the Pathogen Economy category.
ii) Kesha Anti-Fungal and Anti-bacterial gel. Project team – Mally Antony, Akwii Patience Natasha, Namazzi Claire (Department of Biochemistry and Sports Science) - participating under the Pathogen Economy category.
iii) SerchiT – This is a mobile application that helps to trace lost items such as National IDs, academic documents and others. Project team – Atukunda Angel Twesiime, Itaagi Bright, Akankunda Gerald (Department of Physics) - participating under the Industry 4.0+ category.
iv) Food Grade Calcium Carbonate. Project team – Mukama Alex, Eron Calvin, Karahukayo Disan (Department of Chemistry) - participating under the Industry 4.0+ category.

The Deputy Principal, Prof. Juma Kasozi at one of the exhibition stalls of CoNAS students

4.1.7 Welcoming the New Deputy Principal, CoNAS

Makerere University Chancellor, Prof. Ezra Suruma appointed Prof. Juma Kasozi, Deputy Principal, College of Natural Sciences (CoNAS) for the next four years effective 1st April 2022. Prof. Kasozi took on from Prof. Fredrick Jones Muyodi who handed over office to the Principal of CoNAS, Prof. Tumps Winston Ireeta on 7th March 2022. On 7th April 2022, the Principal handed over to Prof. Kasozi at a ceremony witnessed by the Deans, Heads of Department, and administrators at CoNAS. Prof. Juma Kasozi is an Associate Professor in the Department of Mathematics at Makerere University. He has served as Dean, School of Physical Sciences and Head, Department of Mathematics at Makerere University. He holds a PhD from the Makere-
re

University-University of Bergen, MSc (Mathematical Modelling), University of Zimbabwe, and a Bachelor of Science (Mathematics, Physics, Psychology) from Makerere University.

The Principal of CoNAS, Prof. Tumps Winston Ireeta (L) congratulates Prof. Juma Kasozi upon his appointment

4.2 School of Biosciences

4.2.1 Ist NAPIANA Symposium

The NAPIANA-2022 Symposium under the theme: "Reinforcing the Roots of Natural Products Value Chains through Transdisciplinarity for Sustainable Societal Transformation" was held on 17th January 2022 at Makerere University. The main activity at this blended (physical and virtual) symposium held at the College of Computing and Information Sciences Conference Hall was the establishment of the Natural Products Industry Advancement Network Africa (NAPIANA). The Network founded by Dr. Alice Nabatanzi, an academic staff at the College of Natural Sciences (CoNAS) was launched on 7th July 2021 during the RNPIA-2021 Conference held at Imperial Royale Hotel, Kampala. NAPIANA through its transdisciplinary approach aims at bridging the gaps between the stakeholders along the different Natural Products Value chains in order to advance the Natural Products Industry in Africa. The Symposium was officiated by Prof. Christopher Mbazira (Ag. Deputy Vice Chancellor Academic Affairs) and attended by major stakeholders in the Natural Products Industry from Uganda National Bureau of Standards, National Drug Authority, and Natural Chemotherapeutic Research Institute.

Dr Alice Nabatanzi (seated 2nd R) together with the representative of the DVCAA, Prof. Christopher Mbazira (seated R), the former Chancellor Makerere University, Prof. Mondo Kagonyera (seated L), the former Director DRGT, Prof. Buyinza Mukadasi (seated 2nd L) and representatives from partner institutions at the 1st NAPIANA Symposium

4.2.3 Mak selected to offer training services under the PESCA project

To boost capacity in the aquaculture industry, the Government of Uganda through the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) partnered with Makerere University Department of Zoology, Entomology and Fisheries Sciences to offer training services under the Promoting Environmentally Sustainable Commercial Aquaculture (PESCA) project. The five-year PESCA project funded by the European Union aims to support the development of a competitive, job-intensive, environmentally-sustainable and climate-resilient aquaculture value chain in Uganda. Under the programme, the Department of Zoology, Entomology and Fisheries, among other things, facilitated internships and job placements for undergraduate students, supported MSc training of 8 Aquaculture students and will carry out customized modular short-term trainings.

Dr Jackson Efitre is coordinating the training programme at Makerere University

4.2.4 NutriFish Project Participates in Vision Group Harvest Money Expo 2022

Makerere University College of Natural Sciences through the NutriFish Project participated in the Harvest Money Expo held on 18th-20th March 2022 at Kololo Independence Grounds, Kampala. The annual event is an initiative by Vision Group in Kampala, organized with support from the Netherlands Embassy and other partners. The theme of the Harvest Money Expo was, 'Farming as a Business'. The expo aims at giving farmers the best agronomical practices and value addition tips throughout the production value chains of the different enterprises, as well as equipping farmers with knowledge on their areas of interest. The expo attended by thousands of agriculture enthusiasts from all over the country presented farmers a platform to showcase their innovations and new farming opportunities but also to learn from other exhibitors. It also presented exhibitors an opportunity to meet potential partners and clients. Supported by the International Research Development Centre (IDRC) and the Australian Centre for International Agricultural Research (ACIAR) through their joint programme, Cultivate Africa's Future Fund (Culti-AF), NutriFish aims to increase availability, accessibility and consumption of underutilized small fishes and Nile perch by-products for sustainable food, nutrition security and better livelihoods of vulnerable groups in Uganda. The NutriFish project is implemented in Uganda by the Department of Zoology, Entomology and Fisheries Sciences - Makerere University in partnership with the National Fisheries Resources Research Institute (NaFIRRI) - National Agricultural Research Organization (NARO), NUTREAL Limited and McGill University, Canada.

Dr Margaret Masette (R), member of the NutriFish Project explains to participants the nutritional value of Small Pelagic Fishes

4.2.5 Development of a cookbook for small pelagic fishes

The NutriFish Project at CoNAS recognizes the nutritive value of the Small Pelagic Fishes (SPFs), as they are rich in bioavailable micronutrients including iron, zinc, calcium, vitamin A and essential fatty acids (Omega 3, 6). Besides, they are consumed whole, which enhances their nutritional benefits compared to the large fishes. Most consumers, including vulnerable groups in rural and peri-urban communities can purchase SPFs in small quantities at relatively affordable prices. The SPFs are therefore crucial in improving human nutrition, particularly during the first 1000 days of life (from conception to the second birth day) as they contribute to maternal health and better child development. SPFs are however not being consumed in sufficient quantities due to: high levels of adulteration with grit, soil and sand; off-flavors (smelly fish); bitter taste and lack knowledge of the different methods of preparation. The NutriFish project team developed a cookbook with the aim of increasing consumption of the Small Pelagic Fishes.

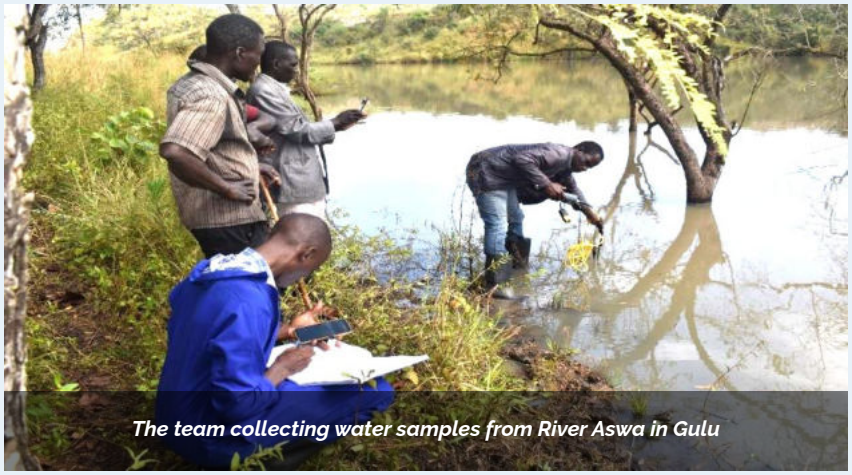
The Cookbook developed by the NutriFish Project team

4.2.6 PAIRWISE Project Stakeholders Engagement in Mbarara and Gulu Cities

The PAIRWISE Project is being implemented in three countries in Europe, and two in Africa. PAIRWISE is investigating the risks posed to human health and the environment by pollutants and pathogens present in water resources. The project also aims to investigate the dispersal of Antibiotics (ATBs), Antibiotic Resistant Bacteria (ARB), and Antibiotic Resistance (ARGs) downstream Wastewater Treatment Plants (WWTPs) by comparing different geographical/climatic regions, wastewater management practices and types of water bodies. Project partners include; National Veterinary Institute (SVA), Sweden; Norwegian Institute for Water Research (NIVA), Norway; Linköping University (LiU), Sweden; Doñana Biological Station, Higher Council for Scientific Research, Spain; National Research Institute for Rural Engineering, Water, and Forestry, Tunisia; Faculty of Medicine Ibn Al-Jazzar Sousse, Tunisia; and the College of Natural Sciences, Makerere University, Uganda. On 31st May 2022, the project team from the Department of Zoology, Entomology and Fisheries Sciences led by Prof. Charles Masembe (Principal Investigator) held a consultative meeting to get buy-in and introduce the PAIRWISE Project to the key stakeholders in Greater Mbarara and River Rwizi catchment. On 25th November 2022, the team held a similar meeting with stakeholders in Gulu City. As part of the project activities, the research team collected samples from River Aswa, Gulu Wastewater Treatment Plant, Gulu Abattoir, dumping sites, hospital effluent and cattle farms in the catchment of River Aswa.

PAIRWISE Stakeholder engagement in Mbarara City

The Project team engaging stakeholders in Gulu City



The team collecting water samples from River Aswa in Gulu

4.2.7 Training workshop on parasite genetics of neglected tropical diseases

The TrypanoGEN+ consortium, Makerere University, and Uganda Virus Research Institute (UVRI) in collaboration with the Africa Centre of Excellence for Neglected Tropical Diseases and Forensic Biotechnology (ACENTDFB) conducted a training programme on a topic - "Parasite Genetics of Neglected Tropical Diseases". The training programme conducted on 9th-13th May 2022 at Makerere Unviersity College of Natural Sciences (CoNAS) and Uganda Virus Research Institute, Entebbe was attended by postgraduate students and researchers with a medical and biomedical background. It was composed of guest talks and practical sessions on trypanosome and schistosomeanalysis methods. The workshop aim was to educate participants on the current trends in elimination of Trypanosomiasis and control of Schistosomiasis with an understanding of the parasite biology. The workshop was also intended to equip the trainees with skills in the detection and genotyping of Parasites.

Dr Monica Namayanja, a Research Scientist trains participants on Trypanosome Culturing, Purification and Visualization using mice

Participants in a group photo after the training

The 4.3 School of Physical Sciences

4 .3.1 8th Workshop on Solar Photovoltaic Installation & Biogas Production

The Renewable Energy Research Group (RERG) at the Department of Physics, College of Natural Sciences (CoNAS), Makerere University has been carrying out training programmes on Solar Photovoltaic Installation and Maintenance, Biogas Production and Solar Thermal Systems annually for the last 8 years. The training programmes are designed to equip participants with competence and skills needed in the installation and maintenance of solar energy Photovoltaic systems and biogas plants. Over 200 people have benefited from the training in the last 8 years. The training held between 16th-20th May 2022 focused on basic electronics and renewable energy Solar Photovoltaic components and configuration; characteristics of Photovoltaic system planning and sizing; storage batteries; introduction to biogas; classification of biogas; Photovoltaic system maintenance; and Solar thermal systems. 20 female students at the Department of Physics were sponsored to undertake the training programme by the following projects: 1) NORHED II Project: Energy Technology Network (EnergyNET) funded by NORAD, Norway, and 2) International Science Program (ISP), Project UGA -01, funded by SIDA, Sweden. The programme was coordinated by Dr Denis Okello, Head, Department of Physics and Dr Karidewa Nyeinga.

Participants in a practical training session at the Department of Physics, Makerere University

4.3.2 Petroleum and Geology students engagement with industry partners on career opportunities

The Makerere University Petroleum and Geology Society (MPGS) aims at uniting students, lecturers and alumni from the Department of Geology and Petroleum Studies, School of Physical Sciences, College of Natural Sciences (CoNAS), Makerere University. It thus creates a collaboration between students and professionals in petroleum and geosciences related disciplines. As part of the mandate, MPGS organizes annual career seminars and exhibitions that target students from Makerere University, particularly the Department of Geology and Petroleum Studies as well as student representatives from various institutions across the country. MPGS organized a career seminar on 25th March 2022 at the College of Engineering, Design, Art and Technology Conference Hall under the theme: "Uganda Post FID: Harnessing opportunities in the oil and gas industry for promoting inclusive and sustainable economic growth for all". Its aim was to introduce career opportunities and guidance towards programmes to improve students' academic, professional and soft skills in preparation for careers in the oil and gas industry. The event was attended by representatives of international oil companies, government agencies, renowned professionals in the sector, lecturers and administrators at the College of Natural Sciences.

The Deputy Principal, CoNAS, Dr Juma Kasozi checking out students' projects at the exhibition

4.3.3 CoNAS students win awards at the International Petroleum Technology Conference

The International Petroleum Technology Conference, IPTC is the flagship multidisciplinary technical event in the Eastern Hemisphere. IPTC is sponsored by four industry organizations and societies namely; the American Association of Petroleum Geologists (AAPG), the European Association of Geoscientists and Engineers (EAGE), the Society of Exploration Geophysicists (SEG), and the Society of Petroleum Engineers (SPE). At each IPTC event, the top 100 undergraduate science, geoscience and engineering students from around the world are invited to participate in IPTC's Education Week. This programme aims to give students a clear insight into the industry they are about to join and the opportunity to interact with a number of major industry employers who are looking to recruit the best talent from institutions around the world. Four students from the Department of Geology and Petroleum Studies, College of Natural Sciences (CoNAS), Makerere University; Busingye Diana, Oyire Gerald, Kusolo Solomon Matanda and Mugoya Michael, were successfully selected to be part of the 2022 Education Week that took place in Riyadh, Saudi Arabia from 19 to 23 February 2022. Students were grouped into 19 different teams where they participated in different competitions such as the Geo-steering competition organized by ROGII, Scavenger Hunt by Schlumberger and the Field Development challenge using Petrel and PIPESIM organized by Schlumberger. The Makerere team won first place award in both the Field Development challenge and the Geo-steering challenge.

The Makerere students team at the IPTC 2022 in Riyadh, Kingdom of Saudi Arabia. L- R: Kusolo Solomon matanda, Mugoya Michael, Busingye Diana, and Oyire Gerald

4.3.4 DRIAR Project Field Training School – 11th-22nd July 2022

Makerere University signed a Memorandum of Understanding with Virginia Polytechnique Institute and State University, the leading institution of the consortia of universities participating in the Dry-Rifting in the Albertine-Rhino Graben (DRIAR Project), to conduct geophysical, geochemical and geological studies of the Albertine-Rhino Graben in Uganda. As part of the activities, the DRIAR Project in conjunction with the Ministry of Energy and Mineral Development - Uganda conducted a two-week field training school for staff and students from the Department of Geology and Petroleum Studies and the Department of Physics at Makerere University. The training covered modules including; GNSS Geodesy, Magnetotellurics, Active Seismology, and Passive Seismology. Fieldwork was conducted in; seismology, structural geology, geochemistry, and magnetics. Trainers included: Dr Sarah Stamps, Associate Professor in the Department of Geosciences at Virginia Tech, also Principal Investigator, DRIAR Project; Dr. Fola Kolawole, Assistant Professor at Columbia University; Prof. Rob Evans, Woods Hole Oceanographic Institution; and Prof. Suzan van der Lee, Northwestern University, USA.

Left: Some of the participants at the opening ceremony of the DRIAR Project Field Training School. Right: Dr Sarah Stamps, Principal Investigator presents an overview of the DRIAR Project

Participants in a group photo with the Deputy Principal, Prof. Juma Kasozi (5th L) after the opening ceremony

4.3.5 Commissioning of the Petroleum Field Research Station in Kibale

Following the discovery of commercial petroleum reserves in Uganda in 2006, Makerere University in 2009 pioneered teaching and research in petroleum programmes. The programmes are offered in the Department of Geology and Petroleum Studies, College of Natural Sciences (CoNAS) at BSc, MSc and PhD levels. As Uganda moves to the next stages of petroleum development, there is need for highly skilled workforce at various stages of exploration, development, production, transportation and refining. However, the progression of teaching and research in these fields has been largely hampered by a serious shortage of sector specific physical infrastructure especially laboratories. There is total lack of specialized equipment to train for upstream, midstream and downstream petroleum operations. According to the Workforce Skills Development Strategy and Plan for the Oil and Gas Sub sector in Uganda (WSDSP), thousands of engineers and managers in the area of control centre operations, as well as geological and petroleum engineering will be required at the development, production processing, transportation and marketing stages in the sector. The education and training institutions therefore have to be equipped in order to

meet current and future petroleum skills needs. Through a project titled, "An assessment to identify research and training laboratory and field equipment and infrastructure for petroleum geosciences and engineering in Higher Educational Institutions of Uganda", researchers from CoNAS set out to establish a field research station in the Albertine Graben to support practical training in petroleum studies. The Project led by Prof. J.Y.T. Mugisha was supported by Makerere University Research and Innovations Fund (Mak-RIF). Other members on the project included; Prof. Michael Owor, former Head, Department of Geology and Petroleum Studies, and currently Dean, School of Physical Sciences (Co-PI); Dr John Mary Kiberu, Senior Lecturer in the Department of Geology and Petroleum Studies; Mr Willy Kasule and Ms. Suzan Kigozi, technicians in the Department; and Mr. Tonny Mugabi, ICT officer in the Department. The field research station was officially commissioned by the Warden Research and Ecological Monitoring, Kibale Conservation area, Ms. Dorothy Kirumira on 6th August 2022.

The Warden Research and Ecological Monitoring, Kibale Conservation area, Ms. Dorothy Kirumira together with the project team commissioning the station

The newly commissioned Petroleum Field Research Station at MUBFS

The Project team with representatives from Mak-RIF after commissioning the station

4.3.6 Recognition of retirees at the Department of Chemistry

The Department of Chemistry hosted some of its retirees to appreciate their contribution to the department and Makerere University.

Some of the ritirees who were recognised for their service to the department

Department of Zoology, Entomology and Fisheries Sciences – Recognition of retirees

The Department of Zoology, Entomology & Fisheries Sciences on 7th/7/2022 recognized retired members of staff for their selfless service to the University. These included; Prof. Deborah Baranga, Dr Samuel Mugisha, Dr Christopher Bakuneeta, Ms. Deborah Nampiima, Mr. Ferbiano Ebonga, Ms. Namuli Babirye & Ms. Juliet Nabatanzi.

4.3.8 Public lecture by eminent scholar Prof. Enos Kiremire

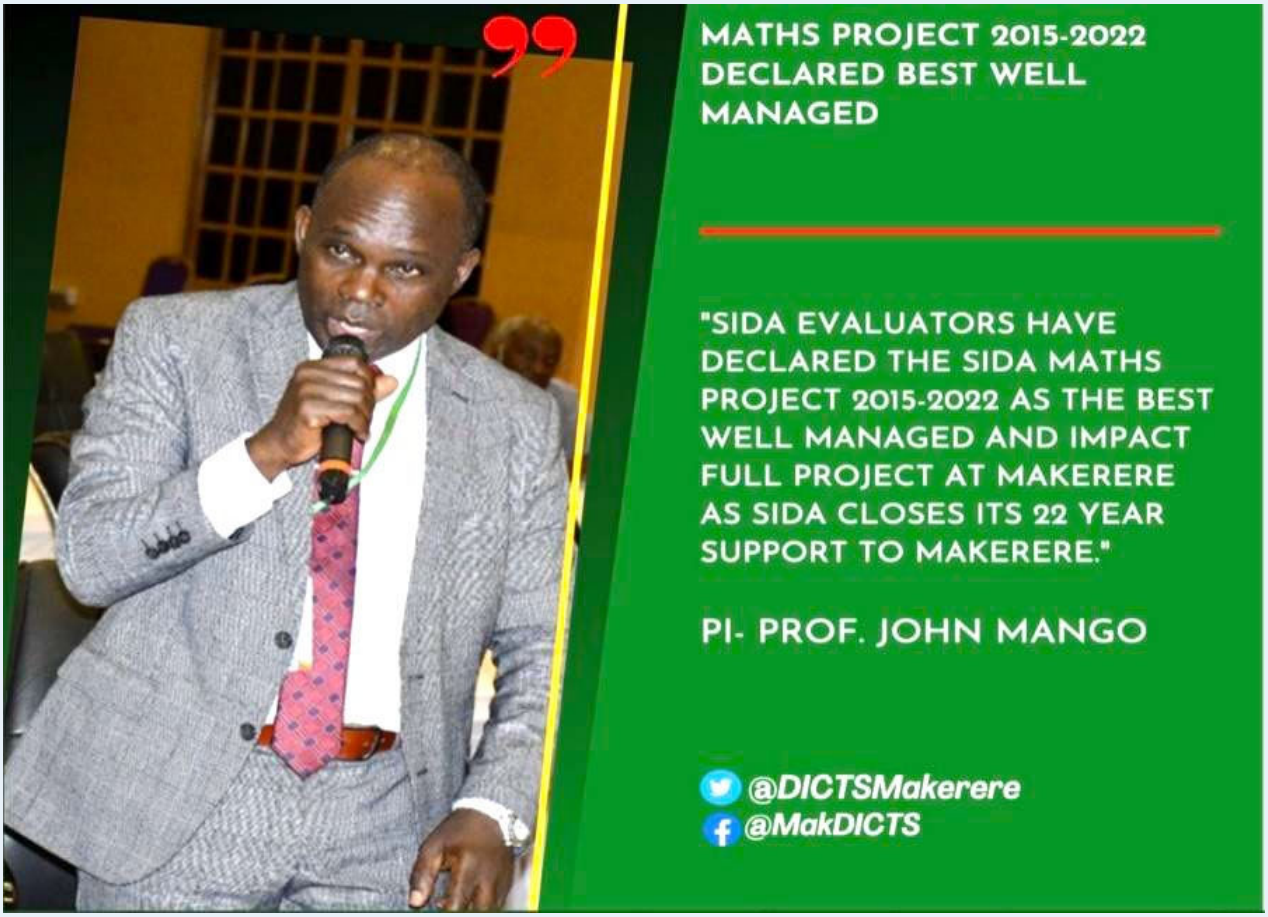
Prof. Enos Kiremire, one of the most outstanding alumni of the Department of Chemistry at Makerere University on 18th June 2022 delivered a lecture on the discovery of natural laws of chemical clusters. The lecture was attended by students of chemistry, staff and alumni of the Department of Chemistry.

Prof. Kiremire at the Department of Chemistry, CoNAS

05 AWARDS & RECOGNITIONS

5.1 SIDA Evaluators declare Mathematics Project 2015-2022 best managed programme at Mak

The Swedish International Development Cooperation Agency (SIDA) evaluators declared the SIDA Mathematics Project 2015-2022 under the College of Natural Sciences (CoNAS) the best managed and impactful programme at Makerere University. The "SIDA Bilateral Programme, 2015-2022, Project 316 - Capacity Building in Mathematics and its Applications" has supported training of 21 PhDs in Mathematics since 2015. At the 72nd graduation ceremony, CoNAS presented 8 PhDs in Mathematics, the highest number of PhDs produced from a single Department in the 100-year history of Makerere University. The programme has also supported 7 post docs and PhD curriculum development. The Principal Investigator is Prof. John Mango from the Department of Mathematics, CoNAS.



5.2 Two Nutrifish-sponsored PhD students win awards of best oral presentations at ICAFA

Two of the NutriFish-sponsored PhD students, Nakiyende Herbert and Julliet Nafula Ogubi won the awards for the best and second-best oral presentations in the young scientists' category at the International Conference on Artisanal Fisheries and Aquaculture (ICAFA) held in Jinja, Uganda from 1st-3rd September 2022. The conference was organized under the theme "Breaking new grounds to recognize and celebrate the contribution of small-scale fisheries towards food security and nutrition". The title for Nakiyende Herbert's presentation was: "Are small pelagic fisheries a blessing or curse? Understanding fisher community perceptions towards light fishing on Lake Albert, Uganda". Julliet Nafula Ogubi's presentation was on: "Spoilage mechanisms and associated drivers in post-harvest loss management in freshwater small pelagic fishes in Africa".

Juliet and Herbert with their awards at the conference

Dr Akite

5.3 Dr Perpetra Akite wins British Ecological Society Marsh Award for Ecologists in Africa

Dr Perpetra Akite was awarded the Marsh Award for Ecologists in Africa. This prize aims to celebrate the significant scientific achievements of African ecologists and raise their profile in the UK. It is provided by the Marsh Charitable Trust and administered by the British Ecological Society. Dr Akite is one of Uganda's leading entomologists and experts in butterflies. She has made important advances in improving knowledge around insects in Uganda, contributing to assessing and mapping key ecologically sensitive species in the country. She has even had a moth named after her. Dr Akite is also passionate about passing on her knowledge to younger generations and takes part in a great deal of outreach activities at both school and university level. Her goal is to encourage more young people – especially African girls - to begin a career in science

5.4 Prof. Muyodi Granted Senior Research Management Professional Status


Prof. Muyodi

The International Professional Recognition Council (IPRC) Technical Review Committee granted Prof. Fredrick Jones Muyodi Senior Research Management Professional Status for demonstrating core and transferable research management competencies. Prof. Muyodi is a member of staff in the Department of Zoology, Entomology and Fisheries Sciences and former Deputy Principal, College of Natural Sciences (CoNAS), Makerere University. He is a Water Resource Management specialist with particular interest in Hydrobiology, Fisheries and Aquaculture, Water Quality, Aquatic and Environmental Health and Microbiology.

He has been involved in a number of scientific studies in climate change impact, adaptation, mitigation and resilience, as well as oil and gas exploration and production. He has coordinated many research and development projects at national and regional levels, and built human capacity in demand driven research projects providing solutions to community problems. He championed the establishment of the research management unit at the College of Natural Sciences (CoNAS), Makerere University, has supervised and mentored several early career researchers, and spearheaded the establishment of several research partnerships.


IPRC International Professional Recognition Council

has conferred upon

Frederick Muyodi

the designation of Senior Research Management Professional (SRMP)

For demonstrating core and transferable research management competencies through experience and training, and for contributing significantly to research management at a leadership level in their particular context.

The professional commits to uphold the principles of the Hiroshima Statement issued by the International Network of Research Management Societies (INORMS)

IPRC TRC Chairperson

25 October 2022
Date of Certification

25 October 2027
Certified Until

06 OUTREACH PROGRAMMES

6.1 Department of Geology and Petroleum Studies

i) Enhancing conjunctive management of surface and groundwater resources in selected trans boundary aquifers: case study for selected shared groundwater bodies in the Nile Basin – Devel opment of water balance models with quantified: recharge, outflows (base flow, deep percolation, etc.) and withdrawals for Mt Elgon aquifer shared between Kenya and Uganda in the Nile Basin. March - Nov 2022, Nile Basin Initiative Secretariat.

6.2 Department of Mathematics - Uganda Mathematical Society

The National Mathematics Contest and Awards
The National Mathematics contests for the levels of primary, O' Level and A' Level were conducted in April 2022 and the prizes were awarded for best performers in different cate gories in July 2022. Under the different categories, the results were as follows;

Table 8: Primary School Mathematics Contest

No	Name	School	District	Rank-Position
1	Ogangi Jonathan	Mother Majeri Primary School	Wakiso	1
2	Ndawula John Kennedy	Victory Learning Primary School	Masaka	1
3	Ggayi Jordan	Mbuya Parents' School	Kampala	3
4	Khiisa Nathan Bolt	Global Junior School	Mukono	3
5	Rousseau Winnie Elizabeth	Kings Way Primary School	Wakiso	3

Table 9: Secondary- O' Level Mathematics Contest

No	Name	School	District	Rank-Position
1	Opio Romano Chris	Bishop Cipriano Kihangire Secondary School	Kampala	1
2	Akatuhurira N. Faith	Mt. St. Mary's College Namagunga	Mukono	2
3	Sseddinda Lincoln Kibuuka	Mengo Senior School	Kampala	3

i) Secondary- A' Level

In the first position in this category(L-R) was Mukalazi Jonathan Benoni from kings college Budo (L), followed by Muwanga Timothy from Kings College Buddo (M) and in the third position was Matsiko Isaac (R) from Ndejje Senior Secondary School in Luweero District.

Table 10: Primary Teachers Colleges Mathematics Contest

No	Name	School	District	Rank-Position
1	Kajumba Faridah	Bulera Core PTC	Hoima	1
2	Karungi Bridget	Bulera Core PTC	Hoima	1
3	Ahurra Janet	Bulera Core PTC	Hoima	3

Table11: University Mathematics Contest

No	Name	School	District	Rank-Position
1	Tugume Andrew	Kyambogo University	Kampala	1
2	Bakasibye Nicholas	Makerere University	Kampala	2
3	Rackara Denish	Makerere University	Kampala	3

Table 11: Regional winners- 2022

No	Name	School	District	Rank-Position
1	Ayo Nelson	Adyel Boarding Primary School	Lira	Northern
2	Shalom Favour	Victoria Nile School	Jinja	Eastern
3	Atusasiire Matthew	Mbarara Junior School	Mbarara	Western
4	Namubiru Prella Philomelah	Jit Day And Boarding School	Mukono	Central

Vii) Other categories

-The Winner of Miss Mathematics Primary 2022 was Rousseau Winnie Elizabeth from Kings Way Primary School in Wakiso District.

-The Winner of Miss Mathematics A-Level 2022 was Ampaire Agatha Asiimwe from Mt. St. Mary's College Namagunga in Mukono district.

6.2.1 International Mathematics Olympiad (IMO)- 2022

The International Mathematical Olympiad (IMO) is the World Championship Mathematics Competition for High School students and is held annually in different countries. The first IMO was held in 1959 in Romania, with 7 countries participating. It has gradually expanded to over 100 countries from 5 continents. The 63rd International Mathematical Olympiad took place in Oslo, Norway, from 6th July to 16th July, 2022. There were five participants who are high school students in the Ugandan Team. The Performance of Uganda in IMO in 2022 was relatively better than the previous one. Uganda was ranked 100 out of 104 countries that participated. Below is the individual performance of the five participants who managed to represent the country at this Olympiad.

Table 12: International Mathematics Olympiad (IMO)-2022

No	Name	Points	Award
1	Mukalazi Jonathan Benoni	09	Honorable mention
2	Matsiko Isaac		
3	Wandera Ralph Felix Jonathan	01	
4	Muwanga Timothy	01	
5	Ssemwezi Patrick Benjamin	02	

i) The IMO winning team of organizers was comprised of:

- Team Leader: Mahadi Ddamulira, Member (UMS) and Lecturer in the Department of Mathematics-Makerere University.
- Deputy Team Leader: Ssesanga Medi, Member (UMS) and Teacher Ndejje S.S
- Observer: Lubega James Member (UMS) and Head of Mathematics Department, Kings College Buddo.

ii) The IMO team 2022 was sponsored by:

- The Romanian Society for Mathematical Sciences under the leadership of Prof. Dr. Radu Gologan.
- Prof. Sergiu Moroianu of Romania in collabo ration with the friends of Uganda athemati cal society worldwide.
- UMS
- Parents and school administrators of the contestants/Olympiads.

Mr. Mukalazi Jonathan Benoni got a Honorable mention at the competitions.

6.2.2 School visitations

The Uganda Mathematical Society in conjunction with the Makerere University Research and Innovations Fund (Mak-RIF) visited several schools in the different parts of the country to mobilize and encourage the young generation to do STEM subjects that will enable the Government achieve the objectives of the third National Development Plan (NDP III), Vision 2040 and the Sustainable Development Goals. Below are some of the photos of the visits;

07 WORKSHOPS & CONFERENCES

i) Workshop on Parasite Genetics of Neglected Tropical Diseases, 9th – 13th May 2022. Funded by the World Bank through the Africa Center of Excellence for Neglected Tropical Diseases and Forensic Biotechnology (ACENTDFB). Amount USD 14,502 – Department of Biochemistry and Sports Science

ii) Global Open Science Cloud (GOSC) IPO launch event organized by CODATA, and CNIC, CAS, held on October 12, 2022 (virtual) – Department of Chemistry

iii) The 2022 International Training Workshop on Open Science and SDGs hosted by the International Research Center of Big Data for Sustainable Development Goals (CBAS), the CAS-TWAS Centre of Excellence on Space Technology for Disaster Mitigation (SDIM), held August 29 – September 9, 2022 (virtual) – Department of Chemistry

iv) TWAS Research Grant Webinar organized from the Netherlands, held June 15, 2022. Theme: "Open Science" –Department of Chemistry

v) Virtual Humboldt Colloquium organized from Cameroon, held March 30 – 31, 2022. Theme: "Science and Research as Drivers for Development: African-German Cooperation in the Post-COVID-19 Era" – Department of Chemistry

vi) Prof. Fredrick Muyodi - Keynote Speaker: Nurturing African Leadership in Sustainable Fisheries and Aquaculture: Jumpstarting a Blue Transformation in Africa, INTERNATIONAL CONFERENCE ON ARTISANAL FISHERIES AND AQUACULTURE, 1-3 September 2022, Source of the Nile Hotel, Jinja, Uganda.

vii) Dr. Patrick Ssebugere attended the 3rd Commonwealth Chemistry Virtual Posters event. Theme "Building Networks to Address the Goals". Held September 28 – 28, 2022.

viii) Dr Patrick Ssebugere – Attended the Curious2022 – Future Insight conference, held July 12-14, 2022 in Darmstadt, Germany. Theme: "United by science for a better tomorrow".

ix) Dr Patrick Ssebugere – Attended the Network Meeting of the Alexander von Humboldt Foundation, Held April 27 – 29, 2022 in Rostock, Germany.

xi 19th – 22nd September, 2022: Multistakeholder workshop at Leipzig University: Partnerships to promote biodiversity in developing countries. Organised by the International SEPT Program, Leipzig University in cooperation with The Regional Institute of Industrial Engineering, Biotechnology & Applied Sciences (IRGIB-Africa)- in Benin and Department of Plant Sciences, Microbiology & Biotechnology, Makerere University.

xii) Summer School - 3rd – 7th October 2022: Biodiversity, Sustainability and Success: The Business of Bio entrepreneurship held in Cotonou, Benin: Partnership between Leipzig University, IRGIB-Africa University and Makerere University. Funded by the Federal Ministry of Economic Cooperation & Development & DAAD.

7.1 Training Courses

i) Dr Tugume Patience – Department of Plant Sciences, Microbiology and Biotechnology - October -November 2022: Bio-Biz: Business models for Sustainable use of Biodiversity. Online course hosted by atingi within the framework of the Access & Benefit Sharing-Sustainable use of Biodiversity (ABSBio) sponsored by the Federal Ministry of Economic Cooperation & Development & DAAD.

ii) Dr Tugume Patience – Department of Plant Sciences, Microbiology and Biotechnology 13th January – 15th March 2022: Climate Change Adaptation in Food Security and Natural Resource Management by Wageningen Centre for Development Innovation (WCDI), Wageningen, Netherlands.

08

HUMAN RESOURCES, APPOINTMENTS, CONFIRMATIONS & PROMOTIONS

In 2022, a number of staff were appointed to different leadership positions. Several members of staff were recruited and others promoted and confirmed into University service as per the tables below.

Table13: Appointment into leadership positions

No	Name	Position	Unit
1.	Prof. Winston Tumps Ireeta	Principal	CoNAS
2.	Prof. Juma Kasozi	Deputy Principal	CoNAS
3.	Prof. Arthur K. Tugume	Dean	School of Biosciences
4.	Prof Michael Owor	Dean	School of Physical Sciences
5.	Dr Arthur Godfrey Batte	Head	Department of Geology & Petroleum Studies
6.	Dr Samuel Ojelel	Head	Department of Plant Sciences, Microbiology and Biotechnology

Table 14: Promotions

No	Name	Department	Rank / Position
1.	Dr Fredrick Jones Muyodi	Zoology, Entomology & Fisheries Sciences	Professor
2.	Dr Joseph Hawumba	Biochemistry & Sports Science	Associate Professor
3.	Dr David Ssevviiri	Mathematics	Associate Professor
4.	Dr Taddeo Ssenyonga	Physics	Associate Professor
5.	Dr Godwin Kakuba	Mathematics	Associate Professor
6.	Dr Betty Nannyonga	Mathematics	Associate Professor
7	Dr Godfrey Kawooya Kubiriza	Zoology, Entomology & Fisheries Sciences	Senior Lecturer
8	Dr Clement Nyakoojo	Plant Sciences, Microbiology & Biotechnology	Senior Lecturer
9	Dr Bosco Oruru	Physics	Senior Lecturer
10	Dr Clement Nyakoojo	Chemistry	Senior Lecturer

Table15: Fresh Appointments – Academic Staff

No	Name	Department	Position
1.	Dr Barbara Nerima	Biochemistry & Sports Science	Lecturer
2.	Dr Herbert Kasozi	Zoology, Entomology & Fisheries Sciences	Lecturer
3.	Mr. Ibrahim Nalukuba	Chemistry	Senior Technician
4.	Mr. Brian Kusiima	Chemistry	Technician
5.	Mr. Ronald Bwambale	Physics	Technical Assistant
6.	Mr. Alex Sembito	Physics	Assistant Lecturer
7.	Ms. Ruth Mbabazi	Chemistry	Assistant Lecturer

8.	Mr. Fahad Matovu	Chemistry	Assistant Lecturer
9.	Mr. Drake Ssempijja	Zoology, Entomology and Fisheries Sciences	Assistant Lecturer
10.	Mr. Ivan Mukiibi Ssewannyaga	Geology and Petroleum Studies	Assistant Lecturer
11.	Mr. Eria Musali	Biochemistry and Sports Science	Teaching Assistant
12.	Mr. Albert Baine	CoNAS	Administrative Assistant
13.	Ms. Hasifa Mukyala	CoNAS	Administrative Assistant

Table 16: Confirmation into University Service

No	Name	School / Department	Position
1.	Dr Job Samuel Kasule	Department of Chemistry	Lecturer
2.	Dr Alfred Ozimati	Department of Plant Sciences, Microbiology and Biotechnology	Lecturer
3.	Dr Shahasi Y. Athman	Plant Sciences, Microbiology and Biotechnology	Lecturer
4.	Mr. Nathan Muyinda	Mathematics	Assistant Lecturer
5.	Ms. Lilian Mugisha	Biochemistry and Sports Science	Assistant Lecturer
6.	Mr. Stephen Kidega Oola	Biochemistry and Sports Science	Assistant Lecturer
7.	Ms. Winfred Nakazibwe	Biochemistry and Sports Science	Assistant Lecturer
8.	Mr. Ibrahim Karume	Chemistry	Assistant Lecturer
9.	Ms. Lilian Mugisha	Department of Biochemistry and Sports Science	Assistant Lecturer
10.	Mr. Stuart Niwagaba		Principal Technician
11.	Mr. William Mukama	Biochemistry and Sports Science	Technician
12	Mr. Odur Luka	Zoology, Entomology and Fisheries Sciences	Technical Assistant
13	Mr Enock Emodock	Geology & Petroleum Studies	Laboratory Attendant
14	Mr. Albert Baine	Principal's Office	Administrative Assistant
15	Mr. Moses Kasaga	Principal's Office	Computer Technician
16	Mr. Abias Asasira	Principal's Office	Chief Custodian
17	Ms. Margaret Nabachwa	Chemistry	Copy Typist

Table17: Post retirement contract

No	Name	School / Department	Rank
1.	Prof. Fredrick Jones Muyodi	Department of Zoology, Entomology and Fisheries Sciences	Professor

09

CONAS PUBLICATIONS 2022

9.1 Department of Plant Sciences, Microbiology and Biotechnology

1 Nabatanzi A, Kazibwe AJN, Nakalembe I, Nabubuya A, Tumwine G, Kungu BN, and JD Kabasa.. 2022. Nutraceutical and Antinutritional properties of Wild edible plants consumed by pregnant women and School-age Children (6-12 years) in Najjembe sub-county, Buikwe district, Uganda. African Journal of Food, Nutrition, Agriculture and Development. 22(10):21990-22016. https://doi.org/10.18697/aj-fand.115.20925

2 Walusansa A., Jesca. L. Nakavuma, Savina Asiimwe, Jamilu. E. Ssenku, Dickson Aruhomukama, Tahalu Sekulima, Hussein. M. Kafeero, Godwin Anywar, Esther Katuura, Alice Nabatanzi, Nathan. L. Musisi, Arthur. K. Tugume and, Esezah. K. Kakudidi. 2022. Medically important bacteria isolated from commercial herbal medicines in Kampala city indicate the need to enhance safety frameworks. Scientific Reports, Springer Nature 12, 16647. DOI:10.1038/s41598-022-21065.

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4 Tugume, P., Kamatenesi-Mugisha, M., Bazirake, G. B., Noah, W., & Asiimwe, S. (2022). The Potency and Efficacy of Essential Oils from Selected Aromatic Crop Species Commercially Grown in Uganda: A Review of their Use in Animal and Human Therapeutics. Challenges and Advances in Pharmaceutical Research Vol. 4, 180-204.

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7 Asiimwe, S., Tugume, P., Kakudidi, E., & Anywar, G. (2022). Potential Impacts of Cannabis sativa L. Cultivation on the Environment in Africa: A Review. Cannabis/Hemp for Sustainable Agriculture and Materials, 311.

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9 Kafeero, H.M., & Walusansa, A.(2022). Medicinal plant use, conservation, and the associated traditional knowledge in rural communities in Eastern Uganda. Trop Med Health 50, 39 https://-doi.org/10.1186/s41182-022-00428-1

10 Masika, F.B., Alicai, T., Shimelis, H., Ddamulira, G., Athman, S.Y., Ipulet, P., Andama, M. and Tugume, A.K., (2022). Pumpkin and watermelon production constraints and management practices in Uganda. CABI Agriculture and Bioscience, 3(1), pp.1-18.

11 Masika, F.B., Lequime, S., Alicai, T., Athman, S.Y., Ipulet, P., Ddamulira, G. and Tugume, A.K., (2022). First report of Pepo aphid-borne yellows virus infecting watermelon (Citrullus lanatus) in Uganda. New Disease Reports, 46(1), p.e12110.

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22 Kaggwa, B., Kyeyune, H., Munanura, E. I., Anywar, G., Lutoti, S., Aber, J., Bagoloire, L. K., Weisheit, A., Tolo, C. U., Kamba, P. F., & Ogwang, P. E. (2022). Safety and Efficacy of Medici nal Plants Used to Manufacture Herbal Products with Regulatory Approval in Uganda: A Cross-Sectional Study. Evidence-Based Complementary and Alternative Medicine, 2022, 1304839. https://-doi.org/10.1155/2022/1304839

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9.2 Department of Zoology, Entomology and Fisheries Sciences

1 Herbert Nakiyende, Lauren Chapman, Anthony Basooma, Dismas Mbabazi, Robinson Odong, Everest Nduwayesu, Samuel Bassa, Bairon Mugeni, Winnie Nkalubo, Alex Mulowoza, Richard Sande Mangeni, Anthony Taabu-Munyaho, Jackson Efitre (2022) A review of light fishing on Lake Albert, Uganda: Implications for a multi-species artisanal fishery, Fish eries Research, Volume 258, https://doi.org/10.1016/j.fishres.2022.106535.

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9.3 Department of Biochemistry and Sports Science

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9.4 Department of Chemistry

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9.5 Department of Geology and Petroleum Studies

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9.6 Department of Mathematics

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18 Numerical ultimate survival probabilities in an insurance portfolio compounded by risky investments. Kasozi, Juma Appl. Appl. Math.17 (2022), no. 1

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9.7 Department of Physics

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10

APPENDIX CoNAS STAFF LIST

College/Administrative Unit		Name of College Principal or Head of Unit
	College of Natural Sciences (CoNAS)	Principal – Prof. Winston Tumps Ireeta
S/N	Name of Staff	Position

Mathematics Department
School of Physical Sciences
Head of Department: Dr. Godwin Kakuba

1.	Prof. Joseph Y. T. Mugisha	Professor
2.	Prof. John Magero Mango	Associate Professor
3.	Prof. Juma Kasozi	Associate Professor (Deputy Principal)
4.	Prof. David Ssevviiri	Associate Professor
5.	Prof. Betty Kivumbi Nannyonga	Associate Professor
6.	Prof. Godwin Kakuba	Associate Professor
7.	Dr. Saul Hannington Nsubuga	Lecturer
8.	Dr. Ismail Geoffrey Mirumbe	Senior Lecturer
9.	Dr. Vincent. A. Ssembatya	Senior Lecturer
10	Dr. Joseph Ssebuliba	Lecturer
11.	Dr. Hassan Ddumba	Lecturer
12.	Dr. Henry Kasumba	Lecturer
13.	Dr Alex S. Bamunoba	Senior Lecturer
14.	Dr. Fred Mayambala	Lecturer
15.	Dr. Alex Behakanira Tumwesigye	Lecturer
16.	Dr. Onesfole Kurama	Lecturer
17.	Dr. Mahad Ddamulira	Lecturer
18.	Dr. Juliet Nakakawa Nsumba	Lecturer
19.	Dr. Denis Wokiyi	Lecturer
20.	Mr. Wilber Grace Naigambi	Lecturer
21.	Mr. Yasin Kikabi	Assistant Lecturer

22	Mrs. Betty Nabiyonga Kirenga	Assistant Lecturer
23	Dr. Hassan Wasswa Kayondo	Assistant Lecturer
24	Mr. David Ddumba Walakira	Assistant Lecturer
25	Dr. Nathan Muyinda	Assistant Lecturer
26	Dr. Innocent Ndikubwayo	Assistant Lecturer

Support staff

27.	Nakku Goretti	Secretary
28.	Habarurema Andrew	Cleaner/Messenger
29.	Nassuuna Jennifer	Cleaner/Messenger
30.	Namembwa Agnes	Cleaner/Messenger
31.	Kabanda Fredrick	Messenger
32.	Abel Wandera	Book bank Librarian

Chemistry Department
School of Physical Sciences
Head of Department: Dr. John Wasswa

33.	Prof. Robert Byamukama	Professor
34.	Prof. Muhammad Ntale	Professor
35.	Dr. George William Nyakairu	Assoc. Professor
36.	Dr. John Wasswa	Senior Lecturer (HoD)
37.	Dr. Gabriel Kasozi	Senior Lecturer
38.	Dr. Betty B. Naziriwo	Senior Lecturer
39.	Dr. Emmanuel Tebandeke	Senior Lecturer
40.	Dr. Patrick Ssebugere	Senior Lecturer
41.	Dr. Hussein Kisiki Nsamba	Lecturer
42.	Dr. Jane Namukobe	Lecturer

43	Dr. Kenneth Arinaitwe	Lecturer
44	Mr. James Sekamatte	Lecturer
45	Dr. Ibrahim Karume	Lecturer
46	Dr. Job Samuel Kasule	Lecturer
47	Dr. Edward Mubiru	Lecturer
48.	Dr. Dan Egesa	Lecturer
49.	Mr. Peter Ernest Maiki	Assistant Lecturer
50.	Dr. Madina Mohammed Adia	Assistant Lecturer
51.	Dr. Solomon Yiga	Assistant Lecturer
52.	Mr. Richard Ochieng	Assistant Lecturer
53.	Dr. Florence Nantaba	Assistant Lecturer
54.	Mr. Fahad Matovu	Assistant Lecturer
55.	Ms. Ruth Mbabazi	Assistant Lecturer
56.	Mr. Patrick Mulindwa	Assistant Lecturer

Support staff

57.	Mr. Bonny Balikuddembe	Principal Technician
58.	Ms. Patience Natumanya	Senior Technician
59.	Mr. Ibrahim Nalukuba	Senior Technician
60.	Mr. Jjagwe Nkalubo Geoffrey	Technician I
61.	Mr. Tindyebwa Sam	Technician I
62.	Mr. Brian Kusiima	Technician
63.	Mr. Kavuma Peter	Technician II
64.	Mr. Ssensamba Dan	Technician II
65.	Mr. Barasa Godfrey Mussitwa	Laboratory Assistant
66.	Ms. Nabachwa Margaret	Copy Typist
67.	Mr. Kasozi John	Laboratory Assistant
68.	Mr. Amanya Jackson	Laboratory Assistant

69	Mr. Masongole Steven	Laboratory Assistant
70	Mr. Mukasa Edward	Technical Assistant
71	Mr. Mugisa Tito	Laboratory Assistant
72	Mr. Mutenyo M.	Laboratory Attendant
73	Mr. Adriko Tom	Laboratory Attendant

Geology and Petroleum Studies Department
School of Physical Sciences
Head of Department: Dr. Arthur Batte

74.	Dr. Andrew Muwanga	Associate Professor
75.	Dr. Michael Owor	Associate Professor/Dean
76.	Dr. Betty Nagudi	Senior Lecturer
77.	Dr. Arthur Batte	Senior Lecturer/ HoD
78.	Dr. John Mary Kiberu	Lecturer
79.	Dr. Kevin Aanyu	Lecturer
80.	Dr. Simon Echegu	Lecturer
81.	Ms. Peggy Kalegga Kulyanyingi	Lecturer
82.	Mr. Lauben Twinomujini	Assistant Lecturer
83.	Mr. Wycliff Kawule	Assistant Lecturer
84.	Mr. Ivan Mukiibi Ssewannyaga	Assistant Lecturer
85.	Ms. Stella Joanita Atugonza	Assistant Lecturer
86.	Ms. Joan Nakajigo	Assistant Lecturer
87.	Mr. Denis Mutebi	Assistant Lecturer
88.	Mr. Hillary Mwongyera	Assistant Lecturer
89.	Ms. Susan Kigozi	Chief Technician
90.	Mr. Moses Kasaka	Principal Technician
91	Mr. Willy Kasule	Technician

Support staff

92	Ms. Jeninah Tumwebaze	Senior Copy Typist
93	Ms. Grace Ssekamanya	Laboratory Attendant
94	Mr. Enock Emodock	Laboratory Attendant
95	Mr. Charles Bagaramba	Cleaner

Physics Department
School of Physical Sciences
Head of Department: Dr. Denis Okello

96	Winston Tumps Ireeta	Associate Professor/Principal
97	Nannungi Eva	Administrative Secretary III
98	Taddeo Ssenyonga	Associate Professor
99	Kibingo Bridget	Technical Assistant
100	Asasira Abias	Chief Custodian
101	Zawedde Annet Eva	Lecturer
102	Musoke Michael	Principal Technician
103	Kawumba Moses	Laboratory Assistant
104	Ssebiyonga Nicolausi	Lecturer
105	Eneku John Paul	Assistant Lecturer
106	Nayibinga Mercline	Principal Technician
107	Kobusingye Stella	Cleaner
108	Namusisi Yowanina	Cleaner
109	Nteziyaremye Ronald	Senior Technician
110	Florence Mutonyi Dujanga	Professor
111	Ayugi Gertrude	Lecturer
112	Oruru Bosco	Lecturer
113	Muyimbwa Dennis	Lecturer
114	Mukiibi Daniel	Lecturer

115	Karidewa Nyeinga	Senior Lecturer
116	Okello Denis	Senior Lecturer/HoD
117	Twinamasiko Benon Fred	Assistant Lecturer
118	Kwarikunda Nicholas	Lecturer
119	Okello Alex	Assistant Lecturer
120	Sembito Alex	Assistant Lecturer
121	Okullo Willy	Senior Lecturer
122	Tusiime Swaleh	Assistant Lecturer
123	Elizabeth Naluminsa	Lecturer
124	Nelson Ndugu	Lecturer
125	Mr. Ronald Bwambale	Technical Assistant

Biochemistry and Sports Science Department
School of Biosciences
Head of Department: Dr. Agnes Nandutu Masawi

126	VUZI Peter California	Senior Lecturer
127	KYAMBADDE Joseph	Senior Lecturer
128	HAWUMBA Joseph Fuuna	Associate Professor
129	ALIBU Pius Vincent	Senior Lecturer
130	MASAWI Agnes Nandutu	Senior Lecturer/HoD
131	KASOZI Denis Matovu	Senior Lecturer
132	WAMUTU Wasibala Samuel	Lecturer
133	ISABIRYE Dan	Lecturer
134	BAINGANA Rhona	Lecturer
135	ISANGA Joel	Lecturer
136	BALYEIDHUSA Apollo Simon Peter	Lecturer

137	RUTARO Karlmax	Lecturer
138	NERIMA Barbara	Lecturer
139	MULINDWA Julius	Lecturer
140	GUMISIRIZA Robert	Assistant Lecturer
141	BUTUNGI Hellen	Assistant Lecturer
142	AGUTTU Clare	Assistant Lecturer
143	OKOL Moses	Assistant Lecturer
144	OMARA John	Assistant Lecturer
145	MUKISA Ambrose	Chief Technician
146	NIWAGABA Stuart	Principal Technician
147	MUGENYI Godfrey	Senior Technician
148	MUKAMA William	Technician

Support staff

149.	NAMANDE Prossy	Laboratory Assistant
150.	KALEERA George	Cleaner
151.	KHAINZA Beatrice Shillah	Cleaner
152.	SSEMUJU Francis	Laboratory Attendant

Sports Science Unit
School of Biosciences
Head of Department: Dr. Agnes Nandutu Masawi

153.	NANKWANGA Annet	Senior Lecturer/Coordinator
154.	KASOMA Sandra Sarah	Senior Lecturer
155.	WANDERA Besweri	Assistant Lecturer
156.	BAMWEYANA Deogratious	Assistant Lecturer
157	OOLA Stephen Kidega	Assistant Lecturer

158	MUGISHA Lillian	Assistant Lecturer
159	NAKAZIBWE Winifred	Assistant Lecturer
160	NAKABAZZI Benedette	Assistant Lecturer

Support staff

162	KYOMUKAMA Robinah	Cleaner

Zoology, Entomology and Fisheries Sciences Department
School of Biosciences
Head of Department: Dr. Eric Sande

162.	Prof. Muyodi Fredrick Jones	Professor
163.	Dr. Anne Margaret AKOL	Associate Professor
164.	Dr. Charles Masembe	Associate Professor
165.	Dr. Efitre Jackson	Senior Lecturer
166.	Dr. Bwanika Gladys Namuswe	Senior Lecturer
167.	Dr. Sande Eric	Senior Lecturer (HoD)
168.	Dr. Kisakye John Joseph Mbago	Lecturer
169.	Dr. Akoll Peter	Senior Lecturer
170.	Dr. Chemurot Moses	Lecturer
171.	Dr. Ronald Semyalo	Lecturer
172.	Dr. Robinson Odong	Lecturer
173.	Dr. Perpetra Akite	Lecturer
174.	Dr. Nalwanga Rosemary	Lecturer
175.	Dr. Godfrey Kawooya Kubiriza	Senior Lecturer
176.	Dr. Nattabi Juliet Kigongo	Lecturer
177.	Dr. Herbert Kasozi	Lecturer

178.	Drake Ssempijja	Assistant Lecturer
179.	Matovu Bernard	Assistant Lecturer
180.	Dr. Kityo Robert Martin	Principal Assistant Curator
181.	Ndagire Noeline	Chief Technician
182.	Niyonzima Eustace	Principal Technician
183.	Namagala Virginia	Senior Technician
184.	Sseddyabane Nsubuga David	Lab. Assistant
185.	Walyelo Alex	Technician
186.	Muchunguzi Joshua	Lab. Assistant
187.	Odur Luka	Technical Assistant

Support Staff

188	Bwete Geraldine	Sec./Steno
189	Katusime Asumpta	Messenger/Cleaner
190	Nakayiza Mary	S/Cleaner
191	Atwijukire Mercy	Messenger

Plant Sciences, Microbiology and Biotechnology Department
School of Biosciences
Acting Head of Department: Dr. Samuel Ojelel

192	Esezah Kyomugisha Kakudidi	Professor
193	Patrick Mucunguzi	Associate Professor
194	Arthur Kajungu Tugume	Assoc. Professor (Dean, SBS)
195	James Kalema	Associate Professor
196	Perpetua Ipulet	Senior Lecturer
197	Esther Katuura Mwebesa	Senior Lecturer
198	Shahasi Yusuf Athman	Lecturer

199.	Jamilu Edirisa Ssenku	Lecturer
200.	Esther Nakamatte	Lecturer
201.	Patience Tugume	Lecturer
202.	Collins Edward Bulafu	Lecturer
203.	Anthony Mutebi Nsubuga	Lecturer
204.	Dorothy Ndagire	Lecturer
205.	Alice Nabatanzi	Lecturer
206.	Byarugaba Savina Asiimwe	Lecturer
207.	Clement Nyakoojo	Lecturer
208.	Alfred Ozimati	Lecturer
209.	Paul Ssegawa	Herbarium Curator
210.	Mary Namaganda	PA Herbarium Curator
211.	Godwin Anywar	Assistant Lecturer
212.	Abubaker Sadik Mustafa	Assistant Lecturer
213.	Teddy Mary Asiimwe Tindyebwa	Assistant Lecturer
214.	Lydia Nabyonga	Assistant Lecturer
215.	Margaret Atim	Assistant Lecturer
216.	Cyprian Osinde	Assistant Lecturer
217.	Samuel Ojelel	Assistant Lecturer (HoD)
218.	Allan Ochieng	Assistant Lecturer
219.	Moses Zziwa	Principal Technician
220.	David Muhereza Begumya	Senior Technician
221.	Christian Abba	Technical Assistant I
222.	Stanley Ofwono	Laboratory Assistant
223.	Geofrey Ssegendo	Technician

Support staff

224.	Grace Wandera	Copy Typist
225.	Robert Kiruge	Grounds man
226.	Fred Ssekandi	Grounds man
227.	Richard Mfitumukiza	Cleaner

Principal's Office

228.	Ms. Hellen Ssali Kalema	College Registrar
229.	Ms. Hasifa Mukyala	Administrative Assistant
230.	Mr. Albert Baine	Administrative Assistant
231.	Mr. David Ikomo	College Procurement Officer
232.	Ms. Sarah Nakayima	College Librarian
233.	Ms. Hasifa Kabejja	College Communication Officer
234.	Mr. Alex Isemaghendera	College Web Administrator
235.	Ms. Claire Birungi	College Bursar
236.	Ms. Harriet Hawa	College Human Resource Officer
237.	Ms. Loyce Amoding	Administrative Secretary I
238.	Mr. Moses Kasagga	Computer Technician
239.	Ms. Samalie Nampewo Sekitte	Administrative Assistant/Sec. Dean SBS

Support staff

240.	Ms. Emily Namatovu	Secretary/ Dep. Principal
241.	Ms. Juliet Zake	Secretary/Dean SPS
242.	Mr. Epaphra Barenga	Accounts Clerk
243.	Ms. Lydia Namugera	Librarian I
244.	Ms. Brenda Akwel	Library Assistant
245.	Ms. Suubi Gertrude	Library Assistant

246.	Ms. Tukundane Emily	Library Assistant
247.	Mr. James Sserwada	Technician II
248.	Mr. Phillip Kagoro Mujwisa	Driver
249.	Mr. Joseph Sennyonga	Messenger
250.	Mr. Timothy Katuramu	Clerical Officer
251.	Mr. Charles Kiyingi	Machine Operator
252.	Mr. Charles Munyamasoko	Cleaner
253.	Ms. Allen Ssanyu Nalyazi	Cleaner
254.	Ms. Margaret Namwase	Cleaner
255.	Ms. Anne Nakintu	Sanitary Cleaner
256.	Ms. Rose Namusisi	Messenger/Cleaner Dep. Principal
257.	Mr. Stephen Mugisa	Cleaner
258.	Ms. Regina Nakabuye	Cleaner
259.	Mr. Nathan Rukundo	Cleaner/Messenger
260.	Mr. Yazid Lubanga	Cleaner/Messenger
261.	Ms. Asina Tibesigwa	Cleaner/Messenger
262.	Mr. Owen Nassasira	Cleaner/Messenger
263.	Mr. Anthony Kawongolo	Cleaner/Messenger
264.	Mr. Siraki Igulu	Cleaner/Messenger
265.	Mr. Davis Amanya	Cleaner/Messenger
266.	Ms. Joyce Nakafeero Nakato	Cleaner/Messenger
267.	Mr. Nobert Bagaba	Cleaner/Messenger
268.	Ms. Aminah Namuli	Cleaner/Messenger
269.	Ms. Janet Mary Katusabe	Cleaner/Messenger
270.	Ms. Mary Nakato	Cleaner/Messenger

271.	Ms. Naswiba Nakasolo	Cleaner/Messenger
272.	Mr. Isma Kalinaki	Cleaner/Messenger
273.	Ms. Alice Nakabembe	Cleaner/Messenger

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