

1 Biodata:

Names: Isa Kabenge
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2 Education and Training

• Ph.D. – University of Nebraska, Lincoln, USA – Agricultural and Biological Systems Engineering	May 2008	May 2011
• Postgraduate Diploma in Project Planning and Management – Uganda Management Institute.	August 2005	August 2006
• Master of Agricultural Engineering – University of Pretoria, South Africa	February 2000	January 2001
• B.Sc. Eng. (Agric.) Upper Second Honors – Makerere University, Uganda – Soil and water engineering.	October 1994	June 1998

Short Courses

- International Association of Impact Assessment (IAIA) QA in EIA, IAIA16 – Nagoya, Japan – May 2016.
- UNESCO-IHE online learning course on "Environmental Flows" (EF-2015) – September 2015.
- Lead Auditor Environmental Management Systems Auditor/ Lead Auditor Training Course (Based on ISO14001:2004) – Beaural Veritus Certification (October 2014).
- Environmental Management Systems - Arab Academy for Science Technology & Maritime Transport (AASTMT) - Productivity and Quality Institute, Alexandria (November 2006).
- Certificate – Planning and Management of Water and Sanitation Technologies for Low Income communities - Uganda Management Institute and WEDC (July 2005).
- Action Monitoring for Effectiveness: Improving community-based water supply and environmental sanitation projects/programmes - NETWAS – Nairobi (June 2004).

- Introduction to GENSTAT for Experimental Data Analysis - Makerere University, Faculty of Agriculture (September 2003).
- Gender Mainstreaming in Makerere University Curriculum - Makerere University, Faculty of Agriculture (August 2002).
- Spreadsheets as a Processing Tool - University of Pretoria, Continuing Education (April 2001).
- Certificate in Appropriate Irrigation Technologies - Makerere University, Faculty of Agriculture and MASHAV-CINADCO (December 1999).

3 Work experience with dates

- 1st November 2021 – to date: Associate Professor Department of Agricultural and Biosystems Engineering, Makerere University.
- 1st July 2017 – to 31st October 2021: Senior Lecturer Department of Agricultural and Biosystems Engineering, Makerere University.
- March 2012 – to June 2017: Lecturer Department of Agricultural and Biosystems Engineering, Makerere University.
- October 1998 – February 2012: Assistant Lecturer Department of Agricultural and Biosystems Engineering, Makerere University.
- 2003 – 2005: Part-time Lecturer – Department of Civil Engineering, Makerere University (Instructed various courses like Water treatment, Solid waste management (for postgraduates), research work planning and guidance).
- 2002 – 2003: Part-time Lecturer – Departments of Zoology, Makerere University (Instructed Environmental chemistry to undergraduate students and coordinated practical and industrial visits).
- 2000 – 2001: Teaching Assistant – Water Utilization Division, University of Pretoria (Conducted testing and analytical laboratory services for water and wastewater - related academic activities and water quality management research).

4 Academic responsibilities

Undergraduate Student Teaching

- October 1998 – to Date: Instructed various courses including Soil and Water Engineering, Mathematics, Surveying, Experimental Design, Design Project Planning, Climatology and Field Engineering, Environmental Engineering, Introduction to Computer Applications, Introduction to Geographical Information Systems (GIS), designed and installed an irrigation system for demonstration and research.

Undergraduate Student Project Supervision

- i. Samuel Abaho (REG. No: 20/U/6971/PS; STD. No: 2000706971) – Project Title was “Using GIS and Remote Sensing to Evaluate Water Resources Adequacy within Lake Mburo National Park for Large Herbivores”.
- ii. Shiella Oling Atim (REG. No: 20/U/6961/PS; STD. No: 2000706961) – Project Title was “Mapping Groundwater in Gulu District and Assessing it for Domestic Use”.
- iii. Alfred Fredy Lokwang (REG. No: 20/U/22563; STD. No: 2000722563) – The project Title was “Developing and Calibrating HEC-HMS-Based Model for Optimizing Reservoir Operation. A case study area of MUARIK Pond”.

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- iv. Lorna Bridget Alal (REG. No: 20/U/0140; STD. No: 2000700140) – The project Title was “Design and Development of a Near-Real Time Cattle Counting System for Estimation of Greenhouse Gases Emissions from Cattle”.
 - v. Enos Osire (REG. No: 20/U/24253/PS; STD. No: 2000724253) – The project Title was “Assessment of the Spatial Distribution and Extent of Soil Erosion in the Lake Opeta Catchment Area”.
 - vi. Maria Namata (REG. No: 20/U/6950/PS; STD. No: 2000706950) – The project Title was “Siting and Sizing of Valley Tanks and Dams using HEC-HMS Modelling”.
 - vii. Maria Namata (REG. No: 20/U/6950/PS; STD. No: 2000706950) – The project Title was “Siting and Sizing of Valley Tanks and Dams using HEC-HMS Modelling”.
 - viii. Fausta Nakigoye (REG. No: 19/U/0016; STD. No: 1900700016) – Project Title was “Assessment of Water Quality in Selected Slums of Kampala”.
 - ix. Onan Agaba (REG. No: 19/U/8618/PS; STD. No: 1900708618) – Project Title was “Water Quality Evaluation in Drinking Water Sources of Kawempe Division using Water Quality Index”.
 - x. Pius Barungi (REG. No: 19/U/14425/PS; STD. No: 1900714425) – Project Title was “Assessment of the effects of Runoff on the road infrastructure: A case study of Namungoona, Kasubi and Masanafu main roads in Rugaba Division”.
 - xi. Sarah Arwako (REG. No: 19/U/28780; STD. No: 1900728780) – Project Title was “Evaluating The Growth Characteristics of Spinach in Vermicompost of Faecal Sludge in Kabanyolo Research Institute”.
 - xii. Anthony Egalu (REG. No: 18/U/15109/PS; STD. No: 1800715109) – Project Title was “Comparative Performance Assessment of Rain-spray, Sprinkler and Drip Irrigation System under Variable Pressure Based on Kale at MUARIK”.
 - xiii. Emmanuel Omia (REG. No: 17/U/9663/PS; STD. No: 217004850) – Project Title was “Developing scalable deep learning algorithms to count cattle from remotely sensed imagery”.
 - xiv. Godfrey Kanya Serugo (REG. No: 17/U/346; STD. No: 217000540) – Project Title was “Developing a mobile application that predicts maize postharvest losses and provides postharvest knowledge to farmers”.
 - xv. Jackline Aboth (REG. No: 17/U/8; STD. No: 217000208) – Project Title was “Impact of Land Use/Land Cover On Well Water Quality Within a Micro Watershed”.
 - xvi. Albert Ainomugisha (REG. No: 16/U/53; STD. No: 216000799) – Project Title was “Site Suitability Analysis for Tea Factory Establishment in Rukungiri District using GIS and Multi Criteria Decision”.
 - xvii. Patrick Ssekidde (REG. No: 16/U/1874; STD. No: 216001802) – Project Title was “Assessment and prediction of land use land cover changes: A case of Lake Kijanebalola watershed in Rakai district, Uganda”.
 - xviii. Trevor Meje Mathias (REG. No: 16/U/7044/PS; STD. No: 216018385) – Project Title was “Site Suitability Analysis for Selected Flood Control Structures in Apeduru - Apapi Sub-Catchment, Awoja”.
 - xix. Faith Brenda Auma (REG. No: 14/U/175; STD. No: 215000081) – Project Title was “Evaluation of Sugarcane Harvesting Methods on Physical-Chemical and Microbiological Changes on Soil and Sugarcane”.

- xx. Dennis Semyalo (REG. No: 15/U/1153; STD. No: 215000208) – Project Title was “Land Suitability Assessment for Sugarcane Cultivation Using A GIS-based Multi Criteria Approach”.
- xxi. Shafik Kiraga (REG. No: 15/U/6468/PS; STD. No: 215005703) – Project Title was “Flood Risk Modeling along Nalukolongo Channel Using ArcGIS, HEC-HMS AND HEC-RAS”.
- xxii. Arnold Brian Oule (REG. No: 14/U/1085; STD. No: 214001094) – Project Title was “Google Earth Engine Platform for Assessing Trends of Above-ground Woody Biomass in Uganda: A Case of Mabira Forest”.
- xxiii. Shona Nabwire (REG. NO: 14/U/780; STD. No: 214000459) – Project Title was “Impact assessment of land-use change due to planted forests on groundwater recharge in Muduuma catchment”.
- xxiv. Gilbert Weizire (REG. No: 13/U/1325; STD. No: 213001346) – Project Title was “Noise Levels within the Makerere University”.
- xxv. Ivan Ntege (REG. No: 12/U/12827/PS; STD. No: 212013252) – Project Title was “Water Quality Assessment at Ggaba on Lake Victoria: The Relationship between Landsat Imagery-Based and Field Monitoring Methods”.
- xxvi. Joshua Twatunga (REG. No: 12/U/1203; STD. No: 212000791) – Project Title was “Simulating the impact of land cover changes on sediment transport using SWAT model: A case of Katosi catchment, Uganda”.
- xxvii. Godfrey Ouma (REG. No: 11/U/56; STD. No: 211000071) – Project Title was “Performance of a Constructed Wetland as an Upstream Intervention for Stormwater Runoff Quality Management”.
- xxviii. Claire Nakabugo (REG. No: 11/U/51; STD. No: 211000487) – Project Title was “Flood Inundation Modelling along Lubigi Primary Drainage Channel”.
- xxix. Richard Otim Kitara (REG. No: 10/U/483; STD. No: 210000969) – Project Title was “Assessing Land Cover Change In the Lake Victoria Sub Catchment Area; Gaba”.
- xxx. Daniel Tusubira (REG. No: 08/U/301; STD. No: 208000021) – Project Title was “Production of Hydroxy Gas (Mixture of Hydrogen and Oxygen) from Water”.
- xxxi. Rogers Baluku (REG. No: 07/U/259; STD. No: 207001272) – Project Title was “Prediction of Soil Erosion using Universal Soil Loss Equation and Geographical Information System in MUARIK”.

Graduate Student Teaching

- Instructed courses including Environmental Engineering (AEN7240), Project Management (AEN 7103), Land Resources Use and Management (AEN 7221), Agricultural Waste Management (AEN7112).

Graduate Student Internal examiner

- i. Rajab Namakhola (REG. No: 2020/HD02/19514U) – Project Title was “Assessment of water availability using the water evaluation and planning (WEAP) model in Namatala River Catchment”.
- ii. Ivan Ntege (REG. No: 2019/HD02/25549U) – Project Title was “Assessing the effect of irrigation water management strategies on Napier Productivity”.
- iii. Christine Atuhaire – 2019/HD08/26536U – The thesis title was “Determination of Satellite Derived PM_{2.5} (A Case Study of Kampala District)”.
- iv. Paul Elema – 2018/HD08/3445U – The thesis title was “Assessing Levels of E-Coli and Heavy Metals in Green Vegetables Grown in the Nakivubo Wetlands”.

- v. Jesse Kisembe – 201X/HD02/YYYYU – The thesis title was “Variations in Groundwater Recharge and associated Risks to Groundwater Supplies over Uganda”.
- vi. Mrs. Cynthia Mutonyi Wandeka – 2016/HD02/107U – The thesis title was “Development and Optimization of the production process of a nutrient enriched snack bar”.
- vii. Fred Seguya – 2014/HD08/1332U – The thesis title was “Determining Vulnerability to Impacts of Floods Amongst Heterogeneous Communities in the Nyamwamba Catchment, Western Uganda”.
- viii. Tukube Emmanuel Dariet Cyrus – 2014/HD02/574X – The thesis title was “Effects of Irrigation on Maize Yield under different Fertilizer Levels in Wakiso District, Uganda”.
- ix. Prosper Achaw Owusu – 2015/HD02/2436X – The thesis title was “Reverse Engineering of Waste Plastics into Liquid Fuel”.
- x. Kasozi James Tondo – 2014/HD02/576U – The thesis title was “Potential of wind energy development for water abstraction systems: A case of Teso region”.
- xi. Anaba Listowel Abugri – 2014/HD02/570X – The thesis title was “Predicting Land Use-Cover Change and its Environmental Impact in the Murchison Bay Catchment of Lake Victoria Basin in Uganda”.
- xii. Daniel Kimuli – 2014/HD02/578U – The thesis title was “Potential of Nutrient Recovery From Pit Latrines: A Case Study of Kampala City”.
- xiii. Percy Kyazze – 2013/HDO2/1923U – The thesis title was “Evaluation of Livestock Watering Reservoirs in Nakasongola District: A case study of Wanzogi Valley Tank”.
- xiv. Fredrick Lule – 2012/HDO2/69U – The thesis title was “A comparative study of two modeling approaches for predicting chemical contaminant migration in foods”.

Graduate Student Viva voce Panellist

- i. Fosca Akutu – 2021/HD08/0076U – Master of Science Geo-Information Science and Technology, CEDAT, Makerere University.
- ii. Gerald Brooks Musinguzi – 2017/HD08/1342U – Master of Science Geo-Information Science and Technology, CEDAT, Makerere University.

Graduate Student External examiner

- i) Constance Makhosazana Nhachi – Student number: [222086287] – The thesis title was “Analysis of Improving the Energetic Characteristics Of Brewers’ Spent Grain For Its Use As A Resource In The Generation Of Biogas”. M. Sc. Eng. in Waste & Resource Management, University of KwaZulu-Natal, South Africa.
- ii) Emily Catherine Nicklin – NCKEMI001 – The thesis title was “An analysis of nature-based treatment processes for cleaning contaminated surface water runoff from an informal settlement: a case study of the Stiebeuel River catchment, Franschhoek, South Africa”. Master of Science Environmental and Geographical Sciences, University of Cape Town.
- iii) Leo Adongo Owora – BU/GS16/MID/1 – The thesis title was “Application of the soil and water assessment tool (SWAT) model in water resources assessment to guide irrigation development in Malaba Sub-Catchment, Uganda”. Masters of Science degree in Irrigation and Drainage Engineering, Busitema University.
- iv) Rogers Masaba – BU/GS16/MID/7 – The thesis title was “Performance evaluation for Doho irrigation system in Butalejja District”. Masters of Science degree in Irrigation and Drainage Engineering, Busitema University.
- v) Sam Eriamu – BU/GS14/MID/20 – The thesis title was “Using WEAP21 System for Optimum Water Allocation Planning in Lake Kochobo Sub-Catchment, Uganda”. Masters of Science degree in Irrigation and Drainage Engineering, Busitema University.

- vi) Tom Gashari – BU/GS16/MID/3 – The thesis title was “Evaluating On-Farm Water Productivity of Furrow, Basin and Hosepipe Irrigation Methods in Tomato Production under Supplementary Irrigation. Case Study: Kabos, Serere District, Uganda”. Masters of Science degree in Irrigation and Drainage Engineering, Busitema University.
- vii) Andrew Ebic – BU/GS14/MID/17 – The thesis title was “Application of a GIS based Multi-criteria Evaluation (MCE) Technique in land Suitability Assessment for Surface Irrigation”. Masters of Science degree in Irrigation and Drainage Engineering, Busitema University.

Post-Doctoral Supervision

1. Dr. Fred M. P. Jjunju – Post Doctoral Research Fellow for the project “Leveraging AI for near real-time cattle counting and Farming system indexing using UAV Videos and images for estimation of GHG emissions (LAIRG)”.
2. Dr. Harman Sanya – Post Doctoral Research Fellow for the project “Leveraging AI for near real-time cattle counting and Farming system indexing using UAV Videos and images for estimation of GHG emissions (LAIRG)”.
3. Dr. Joshua Wanyama – Post Doctoral Research Fellow for the project “Food and Local, Agricultural, and Nutritional Diversity (FOODLAND)”.
4. Dr. Allan John Komakech – Post Doctoral Research Fellow for the project “The Circular Economy of Fruits and Vegetable Supply in Eastern Africa: A case study of Uganda”.

Doctoral Student Supervision to Completion after promotion to Assoc. Prof.

1. Denis Nsubuga (2018/HD02/43938U), Ph.D. student in College of Agricultural and Environmental Sciences. Thesis title was “Production and Life Cycle Assessment of Jackfruit Waste Nutrient-Enriched Biochar as a Soil Amendment and as a CO₂ Sink. Makerere University (Uganda)”. (Graduate Jan. 2024)
2. Erima Godwin (2016/HD02/18991U), Ph.D. student in College of Agricultural and Environmental Sciences. The Thesis title is “Assessment of Flood Risk Patterns in the Manafwa Catchment, Eastern Uganda”. (Graduate Jan. 2024)
3. Justine Kilama Luwa (2015/HD02/18884U), Ph.D. student in College of Agricultural and Environmental Sciences. The Thesis title is “Impact of Climate and Land-Use Changes on Discharge and Sediment Loads in Sironko Catchment, Mt. Elgon”. (Graduate Jan. 2024)

Ongoing Doctoral Student Supervision

1. Michael Ahimbisibwe (2021/HD02/24268U), Ph.D. student in Agricultural Engineering. Thesis title is “Biosorption of Wastewater Pollutants by Encapsulated moringa seed powder and activated Moringa Pod char in a packed small diameter column”.
2. Maximo Twinomuhangi Basheija (2022/HD02/XXXXU), Ph.D. student in Agricultural Engineering. Thesis title is Frequency Analysis of Stationary and non-Stationary Hydrological Extremes for Reducing Risk in a Changing Climate in Lake Kyoga Catchments, Uganda.
3. Amina Nalweyiso (2021/HD02/24069U), Ph.D. student in Agricultural Engineering. Thesis title is “Application of nanoparticles to remediate crude oil contaminated soil and water of the Albertine Graben, Uganda”.
4. Benon Nabaasa Baguma (2022/HD02/XXXXU), Ph.D. student in College of Agricultural and Environmental Sciences. Thesis title is Re-appraising Uganda’s energy geographies for solar power transition: Insights from two solar power plants and one PV Mini-grid.

5. Yamungu Alongo Boniface (2021/HD02/23963X), Ph.D. student in College of Agricultural and Environmental Sciences. Thesis title is Quantifying Greenhouse Gas Emissions and Different Management Practices of Paddy Rice in Eastern Uganda.
6. Job Mutyaba (2019/HD02/30979U), Ph.D. student in College of Agricultural and Environmental Sciences. Thesis title is Examining the potential role of data-driven regulatory models in accelerating decentralized off-grid options and universal electricity access in Sub-Saharan Africa. Makerere University (Uganda).

Graduate Student Supervision to Completion after promotion to Assoc. Prof.

1. Godfrey Ouma (REG. No: 2021/HOD2/1841U) – Project Title was “Assessing The Effect of Deficit Drip Irrigation on Growth and Quality of Eggplant Crop”. (Graduate Jan. 2024)
2. Isaac Rubagumya (2020/HD02/24248U) – The Thesis title was “Mitigation of Greenhouse Gases Attributable to Wasted Fruits and Vegetables in markets”. (Graduated Feb. 2023)
3. Gyaviira Ssewankambo (2020/HD02/24252U) – The Thesis title is “Assessing and Mapping Pathways and Levels of Sediment with its Heavy Metal Loading in the Inner Murchison Bay (IMB) Catchment”. (Graduated Feb. 2023)
4. Ms. Evet Naturinda (2020/HD08/17281U) – The Thesis title was “Estimating Greenhouse Gas Emissions from the Livestock Sector Using Cloud based, Machine Learning Algorithms”. (Graduated Feb. 2023)
5. Diana Mukulu (2020/HD02/19512U) – The Thesis title was “Assessing chicken based organic drip fertigation regimes for improved crop quality, yield, crop water productivity and above ground biomass of tomatoes, cabbage and pumpkin”. (Graduated Feb. 2023)
6. Mr. Walter Okello (2020/HD02/21835U) – The Thesis title was “Performance Enhancement of the Hybrid Solar Dryer (HSD) for commercial drying of high-value agricultural produce in Uganda”. (Graduated Feb. 2023)
7. Ms. Fortunate Kemigyisha (2020/HD02/19509U) – The Thesis title was “Developing Cloud-Based Machine Learning Algorithms for Estimating Biomass as a Carbon Sink for Greenhouse Gas Emissions”. (Graduated Feb. 2023)
8. Ronald Suuna (REG. NO. 2022/HD02/2406U) – Project Title is “Mitigating dairy waste-induced pollution: A comparative assessment of microalgae species”.

Ongoing Graduate Student Supervision

1. Annet Nakidde (REG. NO. 2022/HD02/2403U) – Project Title is “Microalgae wastewater treatment: Assessing the potential for wastewater treatment attributable to Abattoir influents in Uganda”.

Graduate Student Supervision to Completion before promotion to Assoc. Prof.

1. Tadeo Mibulo (2018/HD02/3447U) – The Thesis title was “Potential of biogas production from co-digestion of Jackfruit waste, banana peels and pineapple peels with cow dung: A case of Kangulumira Sub-county, Kayunga District”.
2. James Menya (2017/HD02/1186U) – The Thesis title was “Performance Evaluation and Optimization of Cassava Drying Technologies”.
3. Sam Mutesasira (2016/HD02/106U) – The Thesis title was “Ploughing Performance Evaluation of the Multi-Purpose Vehicle”.
4. Denis Nsubuga (2016/HD02/109U) – The Thesis title was “Performance Evaluation and Optimization of the Maize Shelling Operation of the Multi-Purpose Farm Vehicle”.
5. Ronald Kizza (2015/HD02/448U) – The Thesis title was “Pyrolysis of Pine and Eucalyptus Forestry Wood Residues for Production of Biofuels and Biochar”.

6. Godfrey Omulo (2014/HD02/573K) – The Thesis title was “Optimizing Fast Pyrolysis of Banana Wastes Using Response Surface Method to Enhance Bio-Infrastructure Products Yield”.
7. Resty Nabaterega (2014/HD02/581U) – The Thesis title was “Determining the most Appropriate and Desirable Ratios of Organic Waste for Biogas Generation from Small-Scale Food Processing Units”.
8. Sylvia Nabateesa (2014/HD02/2456U) – The Thesis title was “Occurrence and Survival of Pathogens at different Sludge Depths in Pit Latrines and Proximal Groundwater Sources and Drainage Water Channels”.
9. Joseph Kagulanyi – 2012/HD02/70U – The thesis title was “Grain Amaranth suitability modeling in Uganda”.

5 Administrative responsibilities

International administrative responsibilities

- a) Co-Director ARUA Water Center of Excellence at Rhodes University, South Africa - 2022. The Centre is based at Rhodes University; the CoE partners include Addis Ababa University, Ethiopia; Makerere University, Uganda; University of Dar es Salaam, Tanzania; University of Rwanda, Rwanda; University of Lagos, Nigeria; Cheikh Anta Diop University, Senegal; University of Cape Town, South Africa; University of KwaZulu Natal, South Africa.

Makerere University administrative responsibilities

- a) **Member of Sub-Contracts Committee for College of Agricultural and Environmental Sciences and College of Humanities and Social Sciences (2023-2026) – 23rd November 2023.**
- b) **Member of Examinations Irregularities and Appeals Committee for College of Agricultural and Environmental Sciences – 7th November 2022.**
- c) **Member of Makerere University – Research and Innovation Fund Management Committee – GMC 21st June 2022 – 22nd June 2025 (The GMC manages a Research and Innovations Fund of UGX30,000,000,000 about USD 8.5 million annually).**
- d) **Head of Department of Agricultural and Biosystems Engineering, Makerere University: 1st April 2022.**
- e) **Acting Head of Department of Agricultural and Biosystems Engineering, Makerere University: 4th August 2021.**
- f) **Unanimously selected by colleagues as the next Acting Head of Department of Agricultural and Biosystems Engineering, Makerere University: 16th July 2021.**
- g) **Chairperson of University Investigation Committee – Mismanaged Job Advert 11th May 2021.**
- h) **Member of University Investigation Committee – Misconduct of Dr. Jude Ssempebwa 10th April 2021.**
- i) **Member of Makerere University – Government Grants’ Management Committee – GMC 12th July 2019 - 12th July 2022 (The GMC manages a Research and Innovations Fund of UGX30,000,000,000 about USD 8.5 million annually).**
- j) **Acting Head of Department: Monday, 1st July 2019 – Tuesday, 9 July 2019.**

- k) **Acting Head of Department:** Monday, 15th April 2019 – Friday, 19 April 2019.
- l) **Acting Head of Department:** Wednesday, 1 August 2018 – Friday, 10 August 2018.
- m) **University Strategic Planning 2020-2030:** June 2018: Planning Committee Member of the College of Agricultural and Environmental Sciences as part of the Makerere University Strategic plan 2020-2030 development process.
- n) **Departmental examination coordinator:** June 2016 – 1st April 2022: Responsible for exam papers quality assurance, printing of exam material and collating exam marks.
- o) **Acting Head of Department:** Monday, 11 December 2017 – Wednesday, 13 December 2017.
- p) **Acting Head of Department:** Friday, 1 July 2016 – Friday, 15 July 2016.
- q) **Acting Head of Department:** Sunday, 6 March 2016 – Friday, 11 March 2016.
- r) **Acting Head of Department:** Monday, 26 May 2015 – Sunday, 31 May 2015.
- s) **Acting Head of Department:** Monday, 11 May 2015 – Wednesday, 13 May 2015.
- t) **Departmental curriculum review coordinator:** November 2014 – February 2015. For B.Sc. Agricultural Engineering program. Responsible for drafting the review budget, organising curriculum review workshop, compiling staff input to the curriculum review process and drafting the updated program.
- u) **Departmental recess term coordinator:** June 2011 – 1st April 2022. For students' industrial training at Kabanyolo. Responsible for drafting the budget, training material logistics management, staff scheduling and linkage between College and ABE coordination.
- v) **Departmental recess term coordinator:** June – October 1999. For students' industrial training at Kabanyolo and various industries throughout the country.

6 Research projects

- i) 2024 – Co-Principal Investigator: “Design and Development of an Autonomous Precision Seed Rover: A Robotic Planter for Precision Farming (Seed Rover)”. The project was funded by the Government of Uganda through the Makerere University Research and Innovations Fund - Round 5. The Award amount was UGX123,853,715/= effective January to December 2024. Ugx 123,853,715/=. January to December 2024.
- ii) 2023 – **Team Leader** - “**Developing bio-based solutions for valorising fruit and vegetable waste**”. The project is taking a circular approach to dealing with this FV waste with a number of low-cost solutions that can be combined to reduce losses and valorise the products; Anaerobic Digesters (ADs) collect the waste FV biogas, the resulting biomethane sold for cooking. By burning methane, its greenhouse effect is reduced; AD digestate is used to grow microalgae to reduce the N & P content of the water, which can then be discharged into the water courses with less risk of eutrophication; Algal biomass produced supplement feeding for black soldier fly larvae (BSFL) creating two higher-value products – the BSFL is a protein source for chickens, fish or even humans, and the insects' waste (frass) is a chitin-rich material that can be sold to farmers as a higher-quality fertiliser with excellent nutrient retention properties. The Project funder is GCRF/Newton and ODA grants. The four months Award

contract signed during January 2023, is £(BPS)24,290 and £(BPS)9,558 (G118282 A27229 and G118358 A27323) effective 1st December 2022 to 31st March 2023.

- iii) 2022 – **Team Leader - Hilton Foundation Africa Water Quality Testing Fellowship at Makerere University** shall build a functional water quality testing program Uganda. The Hilton Foundation Africa Water Quality Testing Program covers **Uganda, Ghana and Ethiopia**. At Makerere, the Fellowship pilot year specific objectives were to Engage relevant stakeholders to collaborate in the Fellowship program, Increase the number of skilled personnel in water quality testing, Strengthen laboratory capacity for water quality testing, and Develop recommendations to address water quality and safety in pilot districts of Kabarole and Lira. The fieldwork for the second and third Fellows was planned in Mukono District. The project involves a tracer study for the employment and impact of the 60 Fellows from the first two cohorts. The Project funder is The Hilton Foundation Africa. The Award contract to be signed during May 2022 is annually USD250,000, (24036986.1) effective 2022 to 2026 subject to a successful pilot year.
- iv) 2023 – Principal Investigator - Leveraging AI for near real-time cattle counting and Farming system indexing using UAV Videos and images for estimation of GHG emissions (LAIRG). The overall objective of the proposed project is to develop a novel near-real-time methodology quantifying GHGs Inventory for a particular area by optimizing application of remote sensing, machine learning and artificial intelligence to quantify ranging animals as sources, above ground biomass and ground as sinks and incorporates animal management system. The Project was funded by RUFORUM, WASCAL, RIANCA and Akademia 2063. The Award amount was \$50,000 effective 1st April, 2023 to 31st May, 2024.
- v) 2022 – Team Member - Interdisciplinary cooperation with colleagues at Lund University shall develop strategies for improved solar drying of crops in rural farming communities of Uganda. The proposed collaboration aims to develop and promote solar drying technology co-produced with farmers rather than for the farmers through a participatory action research approach. This project will identify socio-economic and cultural possibilities and constraints for improved solar food drying by initiating a network for future research collaboration. The Project was funded by Swedish Research Council for Sustainable Development (FORMAS). The Award amount was SEK199,745 (USD21,550) effective 01st January 2022 to 31st December 2022.
- vi) 2020 – Principal Investigator - Machine learning for estimating sources and sinks: Developing cloud computing-based, artificially intelligent algorithms to quantify livestock and biomass for management of GHG emissions. The overall objective of the proposed project is to develop a novel methodology quantifying GHGs Inventory for a particular area by optimizing application of remote sensing, machine learning and artificial intelligence to quantify ranging animals as sources, above ground biomass and ground as sinks and incorporates animal management system. The Project was funded by RUFORUM and Global Research Alliance on Agricultural Greenhouse Gases (RU/2020/GRG/06). The Award amount was \$70,040 effective 16th November 2020 to 16th November 2022.
- vii) 2020 – Principal Investigator - "Optimizing irrigation water use: integrative developing of capacity for small scale farmers and relevant local government personnel to improve knowledge and practice of irrigation water use". The goal of the proposed project was to enhance optimum water use for crop production by developing capacity of small scale farmers and relevant multi-disciplinary technical personnel of district local governments. The project

was funded by the Government of Uganda through the Makerere University Research and Innovations Fund (RIF2/CAES/015). The Award amount was UGX 156,210,000/= effective 17th September 2020 to 30th June 2021.

- viii) 2020 – Team Member - Contactless Syndromic AI: for Symptomatic COVID-19 Screening in Low-and-Middle Income Countries (EEG10176). Makerere University - **University of Liverpool Collaboration** / Funded by the University of Liverpool Grants Office from ODA Research Seed Fund, UK (GBP 6,600) effective 1st October 2020 to 31st July 2021.
- ix) 2020 – **Node Leader Makerere University and Co-Director ARUA Water Center of Excellence**. Second Project Awarded to the Water Center of Excellence at **Rhodes University** is titled “Unlocking resilient benefits from African water resources”, **the project aim is: to apply transformative, transdisciplinary, community-engaged research, to ensure that benefits from water development contribute towards local people and the SDG's**. We focus on continental water development priorities - water supply and pollution. The funder is ARUA-UKRI GCRF (£1,999,990), starting 1 April 2020 to 30 December 2023 (ES/T015330/1).
- x) 2019 – **Co-Investigator - The Circular Economy of Fruits and Vegetable Supply in Eastern Africa: A case study of Uganda**. The aim of the study was to reduce negative impact of food waste on food security, poverty, hardship and the environment by applying the principle of circular economy, a regenerative approach where all the resources including waste are utilized at maximum capacity in a continuum process (output of last process contribute to the first one). The Project was funded by The Royal Academy of Engineering's **International Collaboration Awards 2019, to the University of Cambridge to collaborate with Makerere University**. The Award amount was £222,575, effective 30 December 2019 to 30 March 2023 (ICA\R1\191196).
- xi) 2019 – Team Member - Paradigm shift to intelligent agriculture for Ugandan farmers using Internet of Things (IoT) sensors - This project aims were to explore the technical and commercial feasibility for improving the agricultural crop yield and profitability for Ugandan smallholders in rural areas by providing them with a real-time data-decision support system for efficient water and fertiliser management. The Project was funded by Research and Innovation Fund to **Makerere University in collaboration with University of Cambridge startup Company**, from the Government of Uganda (UGX 241,500,000/=), effective from 6th November 2019 to on 30th June 2020 (RIF1/CAES/005).
- xii) 2019 – Engineering Component Leader - Food and Local, Agricultural, and Nutritional Diversity (FOODLAND). Bologna University- Makerere University Collaboration Funded by The EU (EUR 5,000,000), effective 2019 to 2024. The engineering component is **valorising chicken dropping, goat and cow dung to recover and recycle nutrient through fertigation**.
- xiii) 2019 – Co-investigator - Makerere University and Cukurova University Research Collaboration. The overall objective of this project was to establish areas where Makerere University can collaborate with Cukurova University to sustainably build local capacity to transform Nakasongola and other cattle corridor districts. The results will feed into efforts to prepare Ugandan Farmers to be Climate change resilient. Specifically, the objectives included; i) To establish an enabling environment to Irrigate farm lands in Nakasongola, ii) To carry out capacity building on irrigation and water for production for farmers, extension workers, and other water users, iii) To carry out Community based Irrigation Project activities, iv) To show

case innovative and appropriate technologies in irrigation, v) To support educational Cooperation in Irrigation between Makerere University and Cukurova University.

- xiv) 2019 – **Node Leader Makerere University, ARUA Water Center of Excellence. Makerere University is one eight (8) universities across seven (7) African countries, with a UK partner, the University of Sheffield (UoS)** - The overall objective of this programme was to establish Water Center of Excellence to undertake research for selected case study river basins and cities that exemplify “wicked” water problems. People in their contexts comprise complex systems with particular characteristics, such as feedbacks, that mean interventions are at risk of unintended consequences. The project uses the Complex Social and Ecological Systems (CSES) concept to frame the research approach, taking into account the inextricable systemic connections between society & supporting ecosystems. A transdisciplinary (TD) approach is applied, concurrently weaving together knowledge & skills from various disciplines, technologies & perspectives. Water governance is used to underpin research into equitable & sustainable intervention options. Using these together is novel. A cross-cutting theme is to use transformative social learning, developing narratives of hope & learning from failures from existing work, while we work. First Project Awarded to the Water Center of Excellence is titled “Water for African SGDs” to utilise ARUA-UKRI GCRF Capacity Building funding (£598,963), starting 1 September 2019 and ends on 31 August 2022 (ES/T013731/1).
- xv) 2018 – Team member - Fruits and Vegetables for all seasons: Improved resource-efficient processing techniques and new markets for surplus fruits and vegetables for rural development in Sub-Saharan Africa (FruVase). The project is **valorising fruits and vegetable wastes through development of briquettes, production and activation of biochar, energy and fertilizer production from anaerobic digestion reactors**. Funded by BLE Germany Government/ (EUR 976,200), effective 2018 to 2022.
- xvi) 2018 – Co-investigator - Controlled Solar Drying System for Improved Drying Efficiency and Nutritional Quality of Dried Fruit Products. The overall objective of this study was a designed and assembled drying chamber control module integrated into a solar dryer. Specifically, the expected results included; i) Detailed design and system layout of the solar drying chamber control module for a solar dryer develop, ii) Assembled and constructed working prototype of the solar drying chamber control module, iii) Performance test of a solar dryer with the integrated control module and assessment of the nutritional quality of the controlled solar dried fruits. The operating principle of the drier was that solar energy harnessed by a glass covered collector heats the incoming air convectively raising its temperature and lowering its relative humidity. The heated air is driven to the drying unit where it removes moisture and dries the product. The air flow is achieved using three DC fans activated by preset temperature and humidity sensors.
- xvii) 2018 – Co-investigator - Global Challenges Research Fund (GCRF) – Proposal (second level submission, one of 52 from over 300 applicants) Interdisciplinary Research Hubs to Address Intractable Challenges Faced by Developing Countries. The vision of the project is to address the intractable challenges of food waste, poverty alleviation and malnutrition by providing to rural smallholder farmers and communities access to high value protected horticulture supported by the development and application of appropriate technologies and integrated systems of protected cultivation, water management and renewable energy technologies at farm or community level and access to markets through renewable energy

powered cold chain technologies. Am actively developing the proposal and I be guiding the students during the research and development of technologies for the horticulture and manuscripts for publication to disseminated the knowledge (not funded).

- xviii) 2017 – Co-Researcher – **I teamed up with colleagues from New Mexico State University, Farmington, USA, ADA Consulting Africa, Lome, Togo, Institut Senegalais de Recherches Agricoles, Saint Louis, Senegal and University of Nebraska-Lincoln, Lincoln, USA** to undertake regional water management research. We evaluated performance of 12 mass transfer based reference evapotranspiration (ET_{ref}) models in Tanzania and Kenya a spatial extent considered to be a humid climate. We used data accessed from a network of on-ground meteorological stations for the period 1998-2012. The aim of the research was to establish the best suited limited data model to estimate ET_{ref} in the region. ET is a significant variable of the water balance for any basin, agricultural and environmental studies, however it is usually poorly estimated due to lack of data. I modelled the ET, analysed and discussed the performance of the different models. An excellent paper was published from this research which recommended specific models to estimate ET_{ref} for particular areas and the need for regional calibration to improve water management at regional level.
- xix) Co-Researcher – A parallel research we undertook was to quantify differences associated with using 24-h time step reference evapotranspiration (ET_o), as compared with the sum of hourly ET_o computations with the standardized ASCE Penman-Monteith (ASCE-PM) model for semi-arid dry conditions at Fanaye and Ndiaye (Senegal) and semiarid humid conditions at Sapu (The Gambia) and Kankan (Guinea). The results indicated location and montly dependence of the ET_o magnitude values. Although the hourly time step sum and daily overestimated ET_o at different times of the year, we recommended in the published paper, whenever data is available, application of the hourly ET_o estimation method for more accurate ET_o estimation to meet irrigation requirement under precision agriculture.
- xx) 2017 – Student Adviser – Combating the Global Challenge of Mismanaged Plastic Waste through Appropriate Technology. Funded by the P3 Awards: A National Student Design Competition for Sustainability Focusing on People, Prosperity and the Planet (EPA-G2017-P3-Q1). The aim of the project under the department of Agricultural and Biosystems Engineering, Makerere University was to develop test, research and develop innovative technologies that will promote sustainable development, specifically, plastic waste management to eliminate their environmental contamination. I guided the students during the research and development of the manuscripts for publication.
- xxi) October 2015 – September 2017 – Student Supervisor – **Pyrolysis of agricultural waste for bioethanol production and market development.** Funded by the Regional Universities Forum for Capacity Building in Agriculture (RUFORUM). The aim of the project under the department of Agricultural and Biosystems Engineering, Makerere University was to derive value products from agricultural waste through slow pyrolysis. The project funded research for two (2) M.Sc. graduate students. I supervised the research for one of the graduate students and guided the student during thesis compilation.
- xxii) 2013 – to 2017 – Team member – The Sanitation Research for Africa (SRFA) Project – K5/2301/11 entitled “Characterization of pit latrine contents and developing a scientific understanding of processes occurring in onsite dry pit latrines in low income urban areas taking Kampala Suburbs as a case study”. The Project under the department of Agricultural and

Biosystems Engineering, Makerere University aims at providing a comprehensive faecal sludge characterization database for Kampala, Uganda. The project contributes to the broader goal of preventing water and sanitation-related problems in poor urban areas where slums present a challenge to Uganda's urbanization. Key aspects being investigated include the occurrence and survival of pathogens in faecal sludges; evaluating the mechanisms occurring in pits taking into account their respective groundwater level, rainfall, humidity and soil profiles; establishment of the rate of sludge accumulation in pits; and development of localised capacity and expertise in faecal sludge management. The data from this study will complement the SaniHub Kampala Project, which is also part of the SRFA Project portfolio but focuses on desludging and beneficiation technology. The results from this study therefore provided useful information for a range of conditions in which various desludging equipment can be used, developing a guideline for the health and safety of pit emptying activities, and provide an understanding of operation and maintenance needs of pit latrines in and around the city. The project is funding training for four (4) M.Sc. graduate students. The team is led by Dr. Ahmed Zziwa and funded by Water Research Commission, South Africa.

- xxiii) 2008 – 2011 – Team member – **Nebraska Water and Energy Flux Measurement, Modeling, and Research Network (NEBFLUX) that operates ten deluxe version of Bowen ratio energy balance systems (BREBSs) and one eddy covariance system** over various vegetation surfaces ranging from irrigated and rainfed grasslands; irrigated alfalfa; rainfed switchgrass; irrigated and rainfed winter wheat; irrigated continuous maize; irrigated continuous soybean; irrigated maize and soybean rotation under different tillage and management practices; to Phragmites (*Phragmites australis*)-dominated cottonwood and peach-leaf willow plant communities. The NEBFLUX measures all surface energy flux variables, meteorological variables, plant physiological parameters, soil water content (every 0.30 m up to 1.80 m on an hourly basis), soil characteristics, agronomical components, including biomass production and/or yield for a significant number of different vegetation surfaces. All NEBFLUX towers operate on an hourly basis throughout the year. The team was led by Dr. Suat Irmak and funded by Nebraska Natural Resources Districts.
- xxiv) 2003 – Team member – Development of water and sanitation training manuals for water resources personnel at the districts' level in Uganda. The team comprised of Department of Agricultural Engineering Staff, led by Mr. Michael Iwadra. The project was funded by I@Mak.
- xxv) 2002 – Team member – Development of water and sanitation case studies for incorporation into existing courses as part of the gender mainstreaming of Makerere University Curriculum. The team comprised of Faculty of Agriculture Staff, led by Dr. Nagingo Mangheni. The project was funded by I@Mak.

7 Private Sector engagement and Consultations

a) Environmental Engineering Consultant

Isa is a registered engineer (ERB Reg. No. 1343), and has been involved in numerous consulting projects including waste management studies, Irrigation Systems Designs, Environmental and Social Impact Assessments (ESIAs) for various types developments projects, Environmental Policy Studies, Environmental Audits for various industries, design of Water Supply and Pollution Control Systems and Social Baseline and Social Impact Studies.

Examples completed consultancies include i) **Development of core management policies for small-scale sunflower milling agri-businesses in Northern Uganda** to enable the companies to establish and maintain consistent practices grow, remain profitable and responsible to small holder farmers and ensure their compliance with set standards of private firms towards certification by Uganda National Bureau of Standards (UNBS), ii) Environmental & Social Impact Statement (ESIS) of Proposed Early works for Total E&P Uganda, iii) Environmental and Social Impact Assessment (ESIA) and Abbreviated Resettlement Action Plan (ARAP) for the Preparatory Survey for the Greater Kampala Metropolitan Area Transmission System Improvement Project, iv) Environmental and Social Impact Assessment and Resettlement Action Plan (RAP) for feeding into the Engineering Design and Tender Documentation for Improvement of Priority Drainage Systems in Kampala Capital City, v) Environmental and Social Impact Assessment and Resettlement Action Plan (RAP) for Proposed Project on Irrigation Scheme Development in Central and Eastern Uganda, vi) Environmental and Social Impact Assessment and Resettlement Action Plan (RAP) for proposed NWSC Water Supply and Sanitation Projects for Arua, Gulu, Mbale, Bushenyi Project, vii) Environmental Audit for Construction Phase of Nyamasoga Waste treatment and Disposal Facility, Viii) Environmental Audit for TEP Uganda North Nile Facilities (Well sites Jobi 3, Jobi East 3, Jobi East 6, Jobi East 7, and Mpyo-F. Other facilities Tangi Camp, Waste Consolidation Area, Seismic Camp, and Explosive Magazine, ix) Consultancy services to conduct an environmental impact assessment and resettlement policy framework for 14 municipalities in four regions of Uganda, x) Environmental Audit for Sadolin Paint Facility

b) Technical Assistance to Engineering Solutions (EngSol) Limited

I have provided technical assistance to Engsol since 2012. In 2015, as part of a drive to create awareness, understanding and confidence building for the TAFE Tractor Brand, Engsol and TAFE organized a visit for a delegation from Uganda representing key stakeholders in the agricultural mechanization sector to TAFE factories in India. I represented Makerere University on the delegation. We since had an excellent working relationship that include Engsol hosting our students during internship. Indeed, Engsol is strong collaborative partner on research applications from the Department of Agricultural and Biosystems Engineering, Makerere University.

8 International and Domestic Conferences, Seminars and Workshops

- i) October 8th – 11th, 2024 – **Global Grazing Management Platform (GGMP) Workshop, Arusha, Tanzania.**
- ii) September 22nd – 26th, 2024 – **RAEng HEPSSA (Higher Education Partnerships in Sub-Saharan Africa) Workshop on “Harmonizing innovation: Collaborative synthesis of bio-silica nanoparticles derived from rice husk for various industrial applications, Imperial College London, UK. Presentation** – DABE Overview and Opportunities for Nanotechnology Research.
- iii) August 6th – 17th, 2024 – **the 2nd RUFORUM Triennial Conference, Windhoek, Namibia. Presentation** - Leveraging AI and UAV Technologies to Enhance Sustainable Livestock Production. **Rapporteur:** Symposium I: Educating Africa: Implementing Transformative Higher Agricultural Education to Meet Africa’s Human Capital Needs. **Session Chair:** Foresight and trend studies.

- iv) March 4th – 9th, 2024 – **The ARUA – Guild Center of Research Excellence Launch and workshop at the Institute for Water Research.**
- v) January 11th – 16th, 2024 – **The follow-up engagement to our meeting in Kampala in April 2023 at the Artificial Intelligence and Robotics Laboratory, University of Lagos, Nigeria.**
- vi) November 13th – 15th, 2023 – **The ARUA – Guild Cluster in Renewable Energy Workshop, Stellenbosch University, South Africa.**
- vii) October 23rd – 27th, 2023 – **The ARUA Center of Excellency in Energy Capacity Building Workshop in collaboration with the University of Ghana.**
- viii) August 17, 2023 – 26TH NATIONAL TECHNOLOGY CONFERENCE AND EXHIBITION – Uganda Institution of Professional Engineers (UIPE). **Session Chair – Thematic Area: Tapping Engineering Opportunities for Accelerated Africa's Continental Free Trade Area (AFCFTA) Implementation-Uganda's Perspective.**
- ix) July 12th – 14th, 2023 – **Responsible Artificial Intelligence Network for Climate Action in Africa (RAINCA) Proposal Development training, Kigali, Rwanda.**
- x) January 18th – 21st, 2023 – **FoodLAND Annual in person Meeting (2023) for collaborative research, Zanzibar, Tanzania.**
- xi) July 18th – 20th, 2022 – **Collaborative research and ARUA CoE in Energy Capacity Building Workshop, Stellenbosch University, South Africa.**
- xii) June 22nd – 25th, 2022 – **Collaborative research and to undertake the Adaptive Planning Process Workshop scheduled to be held at ARUA Water CoE in Institute for Water Research, Rhodes University, South Africa.**
- xiii) March 19, 2022 – UWEWK 2022. **Thematic Area 2: Building resilience to various risks and shocks:** Presentation - Impact of Land Use Land Cover Within a Well's Micro Watershed On the Water Quality, Authors: Jackline Aboth; Isa Kabenge; Joshua Wanyama.
- xiv) November 19, 2021 – ARUA Third Biennial Conference 2021. **ARUA Water CoE Symposium:** Digital storytelling of African water challenges: links to human health and well-being (Online Event).
- xv) September 20th – November 5th, 2021 – **Collaborative research and to undertake the Adaptive Planning Process Workshop scheduled to be held at ARUA Water CoE in Institute for Water Research, Rhodes University, South Africa.**
- xvi) December 3rd – 5th, 2020 – Gorilla Conference, Protea Hotel by Marriott, Kampala, Uganda. **Session Chair – Waterscapes and pollution: water, energy and food Nexus.**
- xvii) November 27-29, 2019 – **Isa Kabenge**, Royal Academy of Engineering 'Frontiers of Engineering for Development' symposium, Antananarivo, Madagascar. The overall theme of the event: From Feeding People to Nourishing people. **Session Co-Chair – Food loss and waste:** how do we tackle losses and waste of foods already produced?
- xviii) November 18-20, 2019 – **Isa Kabenge**, ARUA Bi-annual International Conference, "Africa and the Fourth Industrial Revolution: Defining a Role for Research Universities", Nairobi, Kenya. **Presentation** – Big Data and Cloud Computing in Water Resources Management: Case Study for Land-use change to Planted Forests and Considerations for African Universities.
- xix) May 20-22, 2019 – United States Africa Command, Uganda Water and Public Health Workshop, Kampala, Uganda.
- xx) April 24-26, 2019 – **Isa Kabenge**, Uganda Association of Impact Assessors and National Environment Management Authority, "Regional Conference on Circular Economy", Kampala,

- Uganda. **Panellist** –African challenges for the circular economy: Framework, regulations, and instruments.
- xxi) May 15-19, 2018 – Makerere University Delegation for a research collaboration initiation visit to Çukurova University, Adana, Turkey.
- xxii) November 14-16, 2017 – **Isa Kabenge**, Biodiversity special symposium of the International Association for Impact Assessment, Washington, DC, USA, “Mainstreaming the Mitigation Hierarchy in Impact Assessment”. **Presentation** – Application of MH in Upstream Oil and Gas, Uganda.
- xxiii) September 12-14, 2017 – Horn of Africa Water Security Workshop, Kampala, Uganda. USGS, United States Africa Command.
- xxiv) November 9-13, 2016 – **Isa Kabenge**, Salzburg Global Seminar, Session 571, “The Next Frontier: Transboundary Conservation for Biodiversity and Peace”. **Presentation** – Transboundary Conservation for Biodiversity and Peace – The Ugandan Experience Salzburg, Austria.
- xxv) October 24-27, 2016 – Joshua Wanyama, Noble Banadda, Florence Kiyimba, Samuel Okurut, Ahamada Zziwa, **Isa Kabenge**, Charles Mutumba, Peter Tumutegyeize, Allan Komakech and Nicholas Kiggundu. Profiling the contribution of agricultural engineering technologies to mechanization of smallholder agriculture in Uganda. **Presentation** at: The Engineering and Technology Innovation for Global Food Security: An ASABE Global Initiative Conference, Stellenbosch, South Africa.
- xxvi) October 24-27, 2016 – Godfrey Omulo, Noble Banadda, **Isa Kabenge** and Jeffrey Seay. Utilization of banana wastes for slow pyrolysis to yield bio-infrastructure products in Uganda. Poster presentation at: The Engineering and Technology Innovation for Global Food Security: An ASABE Global Initiative Conference, Stellenbosch, South Africa.
- xxvii) October 24-27, 2016 – Resty Nabateraga, Nicholas Kiggundu, Noble Banadda, John H. Muyonga, **Isa Kabenge** and Peter Tumutegyeize. Potential of organic waste for biogas generation from small-scale food processing units. **Poster** at: The Engineering and Technology Innovation for Global Food Security: An ASABE Global Initiative Conference, Stellenbosch, South Africa.
- xxviii) July 2016 – EuroScience Open Forum – ESOF2016, Manchester, UK.
- xxix) May 2016 – **Isa Kabenge** International Association of Impact Assessment, Aichi, Nagoya City, Japan. **Poster** – Trial of the Environmental Flow Assessment (EFA) in EIA for sustainable development of hydropower (HP) in Uganda.
- xxx) August 2015 – Research collaboration initiation visit with Faculty and Associate Dean for Research at The University of Georgia, Athens, USA.
- xxxi) July 2014 – International ESRI Education GIS Conference San Diego, California, USA.
- xxxii) May 2011 – Water for Food Conference, Lincoln, Nebraska. **Poster presentation** – Canopy Resistance, Plant Physiological Parameters, Transpiration and Evaporation of a Phragmites - dominated Riparian Plant Community in the Platte River Basin, Nebraska, USA.
- xxxiii) June 2009 – ASABE international conference, Reno Nevada. **Poster presentation** – Dynamics of Climate Change in Nebraska Indicated by Agro-Meteorological Indices Over 116 Years.
- xxxiv) April 2009 – ASABE Mid-Central Meeting, Ames, Iowa. **Partial results presentation** – Dynamics of Climate Change in Nebraska Indicated by Agro-Meteorological Indices Over 129 Years.

9 Published book chapters

Nsubuga, D., **Kabenge, I.**, Zziwa, A., Kiggundu, N., Wanyama, J., & Banadda, N. (2021). Improving Maize Shelling Operation Using Motorized Mobile Shellers: A Step towards Reducing Postharvest Losses in Low Developing Countries. In *Maize Genetic Resources: Breeding Strategies and Recent Advances*, Mohamed El-Esawi (Editor.). IntechOpen. <https://doi.org/10.5772/intechopen.101039>.

10 Publications

Twinomuhangi, M. B., Bamutaze, Y., Kabenge, I., Wanyama, J., Kizza, M., Gabiri, G., & Egli, P. E. (2025). Analysis of stationary and non-stationary hydrological extremes under a changing environment: A systematic review. *HydroResearch*. <https://doi.org/10.1016/j.hydres.2024.12.007> (Accepted 31 December 2024)

Menya, E., Okello, C., Storz, H., Wakatuntu, J. Turyasingura, M., Okot, D. K., Kizito, S., Komakech, A. J., **Kabenge, I.**, Rwahwire, S. & Olupot, P. W., (2024). A review of progress on torrefaction, pyrolysis and briquetting of banana plant wastes for biofuels. *Biomass Conversion and Biorefinery*, pp.1-10. <https://doi.org/10.1007/s13399-024-06204-x> (Accepted 23 September 2024)

Wanyama, J., Bwambale, E., Kiraga, S., Katimbo, A., Nakawuka, P., **Kabenge, I.**, & Oluk, I. (2024). A Systematic Review of Fourth Industrial Revolution Technologies in Smart Irrigation: Constraints, Opportunities, and Future Prospects for sub-Saharan Africa. *Smart Agricultural Technology*, 100412. <https://doi.org/10.1016/j.atech.2024.100412> (Accepted 13 February 2024)

Ouma, G., Wanyama, J., **Kabenge, I.**, Jjagwe, J., Diana, M., & Muyonga, J. (2024). Assessing the effect of deficit drip irrigation regimes on crop performance of eggplant. *Scientia Horticulturae*, 325, 112648. <https://doi.org/10.1016/j.scienta.2023.112648> (Accepted 3 November 2023)

Mibulo, T., Nsubuga, D., Kabenge, I. and Wydra, K.D., (2023). Characterization of briquettes developed from banana peels, pineapple peels and water hyacinth. *Energy, Sustainability and Society* 13:36 <https://doi.org/10.1186/s13705-023-00414-3> (*corresponding Author) (Accepted 10 September 2023)

Kabenge, I., Ssewankambo, G., Nakawuka, P., Wanyama, J., Zziwa, A., Bamutaze, Y., ... & Mantel, S. (2023). Modelling storm event-based sediment yield and assessing its heavy metal loading: case of Lake Victoria's Inner Murchison Bay catchment in Uganda. *Modeling Earth Systems and Environment*, 10, 1973-1991. <https://doi.org/10.1007/s40808-023-01876-2> (Accepted 22 September 2023)

Erima, G., Gidudu, A., Bamutaze, Y., Egeru, A., & **Kabenge, I.** (2023). Spatiotemporal Analysis of the Hydrological Responses to Land-Use Land-Cover Changes in the Manafwa Catchment, Eastern Uganda. *The Professional Geographer*, 1-18. <https://doi.org/10.1080/00330124.2023.2275317> (Accepted July 2023)

Palmer, C., Tanner, J., Akanmu, J., Alamirew, T., Bamutaze, Y., Banadda, N., Cleaver, F., Faye, S., **Kabenge, I.**, Kane, A., Longe, E., Nobert, J., Nsengimana, V., Speight, V., Weston, S., Winter, K., & Woldu, Z. (2023). The Adaptive Systemic Approach: Catalysing more just and sustainable

outcomes from sustainability and natural resources development research. *River Research and Applications*, 1–15. <https://doi.org/10.1002/rra.4178> (Accepted 16 June 2023)

Erima, G., Egeru, A., Gidudu, A., Bamutaze, Y., **Kabenge, I.**, & Asiimwe, R. (2023). Determinants of households' flood risk coping strategies in a high exposure system of the Manafwa catchment and Lake Kyoga Basin. *Water Policy*, 25(5), 468-491. <https://doi.org/10.2166/wp.2023.231> (Accepted March 2023)

Rubagumya, I., Komakech, A.J., Menya, E., Kizito, S., Zziwa, A. and **Kabenge, I.**, (2023). Postharvest Losses of Fruits and Vegetables Along Their Urban Supply Chain in Eastern Africa: a Case Study of Uganda Towards Sustainable Management. *Journal of Biosystems Engineering*, pp.1-10. <https://doi.org/10.1007/s42853-023-00177-x> (*corresponding Author) (Accepted 23 February 2023)

Rubagumya, I., Komakech, A.J., **Kabenge, I.** and Kiggundu, N., (2023). Potential of organic waste to energy and bio-fertilizer production in Sub-Saharan Africa: a review. *Waste Disposal & Sustainable Energy*, pp.1-9. <https://doi.org/10.1007/s42768-022-00131-1> (Accepted 06 December 2022)

Katimbo, A., Rudnick, D. R., Zhang, J., Ge, Y., DeJonge, K. C., Franz, T. E., ... & Duan, J. (2023). Evaluation of Artificial Intelligence Algorithms with Sensor Data Assimilation in Estimating Crop Evapotranspiration and Crop Water Stress Index for Irrigation Water Management. *Smart Agricultural Technology*, 100176. <https://doi.org/10.1016/j.atech.2023.100176> (Accepted 7 January 2023)

Omia, E., Bae, H., Park, E., Kim, M. S., Baek, I., **Kabenge, I.**, & Cho, B. K. (2023). Remote Sensing in Field Crop Monitoring: A Comprehensive Review of Sensor Systems, Data Analyses and Recent Advances. *Remote Sensing*, 15(2), 354. <https://doi.org/10.3390/rs15020354> (Accepted: 1 January 2023)

Nsubuga, D., **Kabenge, I.**, Zziwa, A., Yiga, A.V., Mpendo, Y., Mawejje, H., Kizza, R., Banadda, N., and Wydra, K. D. (2023). Optimization of adsorbent dose and contact time for the production of jackfruit waste nutrient-enriched biochar. *Journal of Waste Disposal & Sustainable Energy*, 5(1), 63-74. <https://doi.org/10.1007/s42768-022-00123-1> (Accepted 15 November 2022)

Erima, G., **Kabenge, I.**, Gidudu, A., Bamutaze, Y., & Egeru, A. (2022). Differentiated Spatial-Temporal Flood Vulnerability and Risk Assessment in Lowland Plains in Eastern Uganda. *Hydrology*, 9(11), 201. <https://doi.org/10.3390/hydrology9110201>, (Accepted 1 November 2022)

Ssewankambo, G., **Kabenge, I.**, Nakawuka, P., Wanyama, J., Zziwa, A., Bamutaze, Y., ... & Tessema, B. (2022). Assessing soil erosion risk in a peri-urban catchment of the Lake Victoria basin. *Modeling Earth Systems and Environment*, 1-17. <https://doi.org/10.1007/s40808-022-01565-6>, SpringerNature (Accepted 06 October 2022)

Katimbo, A., Rudnick, D. R., Liang, W. Z., DeJonge, K. C., Lo, T. H., Franz, T. E., Qiao, X., **Kabenge, I.**, Nakabuye, N. H. & Duan, J. (2022). Two source energy balance maize evapotranspiration estimates using close-canopy mobile infrared sensors and upscaling methods

under variable water stress conditions. *Agricultural Water Management*, 274, 107972. <https://doi.org/10.1016/j.agwat.2022.107972> (Accepted 1 October 2022)

Irmak, S., **I. Kabenge**, D. Woodward, and M. Moravek (2022), Modeling Leaf Stomatal Resistance for Common Reed, Peach-Leaf Willow and Cottonwood Riparian Plant Communities, *Hydrological Processes*, 36(9), e14687. <https://doi.org/10.1002/hyp.14687>, (Accepted 25 August 2022)

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Kajubi, L. and **Kabenge, I.** (2004) "Sustainability of Healthcare Waste Incineration in Uganda Still Elusive!" Uganda Institution of Professional Engineers, UIPE News Letter, January. *Description:* Healthcare waste incinerators in Uganda were analyzed to establish how environmentally sustainable are the operation procedures.

Kabenge, I. and Kajubi, L. (2003) "A Review of Bottled Water Quality – Lessons For Uganda?" Uganda Institution of Professional Engineers, UIPE Newsletter Vol.10, No.4. *Description:* Literature of bottled water quality was reviewed and important lessons that can be adopted in Uganda were highlighted.

Toxicity of MTBE to *A. penisouliodes*: M. Eng. Final Year Project, University of Pretoria, Water Utilization Division, South Africa. *Description:* Investigating the toxicity of MTBE a fuel additive to *A. penisouliodes* using respirometric techniques. The fungi was grown in a continuously mixed reactor, from where samples were collected. The respiration rate and decay rate of the fungus were used respectively as the toxicity indicators.

Kabenge, I. (2000) "Adsorption technologies in potable water production", Uganda Institution of Professional Engineers, UIPE Newsletter Vol.7, No.9. *Description:* Literature of adsorption technologies used in portable water production was reviewed to showcase the various technologies to Ugandans.

Design of a water conveyance and distribution system to rehabilitate the sprinkler irrigation system for pasture paddocks at MUARIK: B.Sc. Ag. Eng. Final year project, Makerere University, Uganda.

a) Peer Reviewer

In addition to publishing, I have been invited to join the editorial board for the Springer published Journal of Biosystems Engineering (<https://www.springer.com/engineering/control/journal/42853?detailsPage=editorialBoard>) and to be a reviewer for other international journals. Some of journals for which I have volunteered and reviewed manuscripts include:

- i) Environmental Progress & Sustainable Energy a Wiley Publications Journal (<https://onlinelibrary.wiley.com/journal/19447450>)
- ii) Agricultural Engineering International: CIGR Journal (<http://www.cigrjournal.org/>)

b) Research Proposal Reviewer

- i) August, 2024 – Nominated by the Uganda Institution of Professional Engineers (UIPE) in Collaboration with the Royal Academy of Engineers as an Innovation Evaluation Committee Member on the Phase 5 Project. The project is titled ‘Strengthening the Institutional Framework of UIPE to advance the Contribution of Engineering Professionals to Innovation Value Chain in Uganda’. The activity was to select previously sponsored innovators by the Royal Academy UK for support to upscale the innovations to the Most Viable Products.
- ii) February, 2020 – Nominated by the Directorate of Research and Graduate Training (DRGT) to peer-review Two (2) of 15 submitted research proposals responding to a 2-year Carnegie Grant aimed at, “Supporting Early-Career Academics at Makerere University, (SECA). Titles reviewed, “Climate change and hydrologic risk” and “Comparative performance evaluation of in-situ and portable biogas digesters in Uganda’s geographical regions to enhance biogas technology adoption”.
- iii) February, 2020 – Nominated to the International Advisory Committee of the Cooperation South Africa-The Netherlands research programme on behalf of the Dutch Research Council (NWO) and the National Research Foundation of South Africa (NRF) to evaluate the submitted research proposals and formulate an advice for the NWO-WOTRO Steering Committee and the NRF RISA Executives on which research proposals ought to be funded.
- iv) December, 2018 – Nominated to the Reviewer and Evaluation Panel for Uganda Council for Science and Technology (UNCST) for proposals that were responding to a call for joint research projects by the Strategic Support Program for Scientific Research (PASRES) of Côte d'Ivoire and the Uganda Council for Science and Technology (UNCST) supported by Theme 3 of the Science Granting Councils Initiative (SGCI) <<https://sgcigrants.uncst.go.ug/>>.

11 Research interests

- Integration of Artificial Intelligence (AI) and Internet of Things (IoT) in biological systems management.
- Application of biological systems for environmental protection.
- Soil nutrient and moisture interaction and management.
- Evapotranspiration and other energy fluxes of vegetative surfaces.
- Application of GIS and remote sensing to management of natural resources.
- Quantification of plants water use and surface energy balance.

- Water/Wastewater systems design, operation and maintenance.
- Renewable energy development and optimisation.

12 Membership to National and International Bodies/Associations

- i) Registered Engineer, Engineers Registration Board (ERB Reg. No. 1343).
- ii) Member American Society of Agricultural and Biological Engineers (ASABE).
- iii) Corporate Member, Uganda Institution of professional Engineers (UIPE – PE/1453).
- iv) Student member, South African Institute of Agricultural Engineers (SAIAE).
- v) Graduate member, Water Institute of Southern Africa (WISA).
- vi) Member Uganda Association of Impact Assessment Practitioners (UAIA).
- vii) NEMA-registered and certified Environmental Auditor – Team Leader.
- viii) NEMA-registered and certified Environmental Impact Assessment Practitioner – Team Leader.

13 Service to community

- i) 2024 - 2026 – **Appointed Council Member for the Uganda Institution of Professional Engineering (UIPE)** – 15th November 2023.
- ii) October 2022-October, 2025 – **Appointed member of the Education Committee of Uganda National Academy of Sciences (UNAS)**. The duties include; a) Review policies and published and unpublished evidence relating to the teaching and learning of sciences, b) Strengthen the capacity of Academics to analyse and generate evidence-based knowledge and information, c) To establish pilot Inquiry-Based Science Education sites, d) To conduct training of trainers who are capable of effectively training other teachers, e) To influence science and education policy, and, f) Undertake related activities that are assigned by the Council.
- iii) Member of **Research, Innovation and Grants Committee (RIG) for Uganda Institution of Professional Engineers** – June 2022-April, 2024.
- iv) July, 2020 – **Appointed to the Thermogenn Advisory Board**. The group develops technological interventions designed to improve human and economic development within complex, low-resource settings or Sub-Saharan Africa. The intent is to reach millions of households, strengthen their resilience through increased incomes from adopting the interventions like EVAKUULA use, WANDAMIX making and/or use in their smallholder farmer operations. I bring to the board highly needed expertise and understanding of the local business environment.
- v) March, 2019 – **Appointed to the Governance Council of Institute of Advanced Leadership - Uganda**. The main duties include monitoring and evaluating the performance of Institute, overseeing the work of the Principle and Team, ensuring total quality assurance of the Institute, mobilizing and fundraising for the Institute and publicising Image of the Institute.

- vi) 2011 – to date Serves as **Non-executive board member for Chum International School**, Muyenga, Kampala. Part of my interest in educating the young generation, through sharing my experiences.
- vii) 2009 - Served as a **Panelist at the Meadow Lane Elementary School, Lincoln, Nebraska** during their Career week on March 18, 2009 at the invitation of Dr. Curtis Weller. Spoke about my work as an environmental engineer in Uganda and being a post graduate student in the USA. I hope to continue engaging Elementary Schools in Uganda to share my experiences.

14 Honours and Awards

June 2016	Robert Bosch Stiftung Travel Grant for African Researchers Award
August 2016	ASABE Travel grant for Engineering and Technology Innovation for Global Food Security Conference
October 2016	Salzburg Global Seminar Grant
May 2010	Bill A. and Rita L. Stout Outstanding International Graduate Student.
November 2009	Nebraska Water Environment Association Scholarship.
July 2009	Milton E. Mohr Fellowship.
January 2009	David H. and Annie E. Larrick/William G. Whitmore Memorial Travel Fund.
August 2008	Mary and Charles C. Cooper/Emma I. Sharpless Fellowship.
May 2008	Graduate Research Assistantship, BSE, University of Nebraska – Lincoln.
February 2000	DAAD Academic Scholarship.
October 1998	Best Agricultural Engineering student 1998, Makerere University.

Dr. Isa Kabenge



Sign:

Date: Thursday, July 2, 2026