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About/Introductory statement

Dr. Patrick Musinguzi is a Lecturer in the Department of Agricultural Production (Soil Science unit) Makerere University. He holds a PhD in Soil Science, Master of Science in Soil Science and a Bachelors of Science in Agricultural Land Use and Management. He works at the University with a core mandate of teaching, research and community outreach. His research interests are mainly anchored on developing novel soil management technologies tailored to African Cropping Systems but also in integrated interventions for sustainable land management. His areas of professional development and focus are soil fertility improvement, appropriate technologies to combat land degradation, and devising resilient climate smart technologies for increased agricultural production and productivity. Dr Musinguzi is keen on teamwork and partnerships in advancing any research agenda for sustainable development and transformation of livelihoods.

Qualifications

PhD (Soil Science), Makerere University, 2018.
Master of Science in Soil Science, Makerere University, 2008
Bachelor of Science in Agricultural Land Use and Management, Makerere University, 2004

Biography

Dr Patrick Musinguzi jo

Other Activities

Dr Musinguzi is involved with many works outside the mainstream staff activity and these include**:**

1. **Council member –** St Francis Chapel Makerere University (2021-2025)
2. **Member of Technical Committee** of the National Organizing Committee under the Water and Environment Week 2020, 2021 and 2022 under the Ministry of Water and

Environment/National Organising committee

3. **Board Member of Bunyoro Think Tank –** under the Bunyoro Kitata Development Think Tank forum – community development organization
4. **Secretary of Soil Science Society of East Africa (Uganda Chapter) –** A professional group of soil scientists advocating for research and development on sustainable soils in Uganda
5. **Appointed General Secretary** for the 1st Great Lakes and Catchment Management Conference 2019 – organized by Ministry of Water and Environment, and Makerere University
6. **Coordinator, AFSLWA 2021-2025 of** the African Network on sustainable land and water use (AfSLWa)
7. **Board Management Committee:** Geomasters International Ltd – a cooperate organization working on water, land, agriculture, environment climate change, ICT, digitization and livelihood transformation in East Africa.

Teaching

- Dr Patrick Musinguzi teaches various undergraduate and post-graduate academic programs in the University including Bachelor of Science in Agriculture, Bachelor of Science in Agricultural Land Use and Management, Bachelor of Science in Agricultural and Rural Innovations, Master of Science in Soil Science, and Masters of Science in Integrated Watershed Management
- His special interest in teaching is mainly in soil organic matter, soil fertility, nutrient cycling, pedology and land use, climate change adaptation, catchment planning and restoration, sustainable land use management

Research

Dr Musinguzi conducts and has also done research with various local and global partners with special interest in:

(i) Applications of ICT digital tools to aid decision making in sustainable soil and land management . Several tools are being developed but current efforts are on the '*Development of Enviroewatch Mobile App for increased community surveillance in monitoring catchment degradation and restoration along River Rwizi*' The research is funded by Government of Uganda through the Makerere University Research and

Innovation Fund (MAK-RIF). There are also efforts to digitise the Makerere University soil test kit that is proving to be a critical tool for advancing soil testing services closer to the end-ser (the farmer)

(ii) Application of climate change responsive adaptation measures with right fertilization (organic and inorganic) to enhance plant nutrition and productivity. Research in partnership with NARO,MAAIF, Local Government is ongoing on '*Enhancing Rice Productivity through Adaptation of Climate-Smart Agricultural Options and Market Responsive Business Strategies in Uganda'* under the funding of APNI. There are also partnerships in conducting biochar studies especially in soil amendment in pigeon peas for increased resilience to climate change under the 'climate smart innovations in agriculture in Uganda: Improved food security, livelihoods and soil carbon (-NORGLOBAL2). The studies are in partnership with Norwegian University of Life Sciences.

(iii) Enhancement of Phosphorus availability. Some research under the Young African Phosphorus Fellowship on Evaluating 'Legacy Phosphorus' in Fertilized Maize Fields for Improved Phosphorus Management in Uganda has been conducted with funding from APNI/OCP. There is potential to build P in the soils of Uganda but further research is needed to explore ways of increasing phosphorus availability under novel biofertilization and management regimes.

(iv) Fertilizer recommendations. There have been efforts under the MAK-RIF project on 'Upgrading fertilizer recommendations for priority crops in Uganda' and research is still ongoing with partners such as National Agricultural Research Organisation to improve soil fertility management with right fertilization strategies, Fertilizer recommendation rates have been developed for crops such as banana, rice and maize and a lot is needed to cover all crops in the country and beyond.

(v) Climate change and crop modelling. Research in the application of APSIM and DSSAT model for predicting impact of climate change in crop production has been done, The projections have been conducted under the Agricultural Modelling Inter-comparison and Improvement Project in Sub Saharan Africa and South Asia (AGMIP SSA) on 'Assessing the impacts of climate variability and change on agricultural systems in Eastern Africa while enhancing the region's capacity to undertake integrated assessment of vulnerabilities to future changes in climate. The projections on climate change impacts on crops is guiding the future with suitable soil and crop management options to counter likely threats to production

(vi) The estimation of nitrogen footprint as one tool for greenhouse gases monitoring. The European Commission funded project on 'Quantifying the Nitrogen Footprint for increased climate change predictions and advanced the concept of land degradation neutrality like what is done with the carbon footprint so as to sensitise on the proper use of resources with minimum energy loses.

Research groups and Centres

https://africa-uninet.at/en/
https://www.geomastersinternational.com/
https://paafrica.org/
https://www.globalsoilbiodiversity.org/
https://agmip.org/

Community based work

Dr Musinguzi is involved in several community related activiies under various groups. These include the ofollowing among others and these include:

1. The Dons Investment Club
2. The St Francis Investment Cooperative Society ltd
3.

Awards or special recognitions received

Pioneer Award under the Presidential Initiative on Banana Industrial Development (PIBID)

Publications

Bagula, E.M., Majaliwa, J.G.M., Mushagalusa, G.N., Basamba, T.A., Tumuhairwe, J.B., Mondo, J.G.M., **Musinguzi, P**., Mwimangire, C.B., Chuma, G.B., Egeru, A. and Tenywa, M.M., 2022.

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Bamutaze, Michael E. Meadows, Majaliwa Mwanjalolo, **Patrick Musinguzi** (2021). Effect of land use systems and topographical attributes on the condition of surface soil physicochemical properties in a highland catchment of the Lake Victoria Basin, Uganda . Catena 203 (2021) 105343

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More than three years

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Kayuki C. Kaizzi, John Byalebeka, Onesmus Semalulu, Isaac Alou, Williams Zimwanguyizza, Angella Nansamba, **Patrick Musinguzi**, Peter Ebanyat, Theodore Hyuha and Charles S. Wortmann, 2011. Maize Response to Fertilizer and Nitrogen Use Efficiency in Uganda. *Agronomy Journal*. Vol. 104: (1) 73-82.

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Podcasts

Videos

https://www.youtube.com/watch?v=qPnPwcRpXZU presented on UBC on soil deterioration in Uganda

Modern rice farming on Kikuube on APNI project by urban TV

https://www.youtube.com/watch?v=qO9GaIQlSLY

Dissemination on the recent work on Matooke production and fertilizer recommendations on Bukedde TV (noted in in Luganda)
https://youtu.be/Hy2UOcCmW3c

The precision conference at Protea Hotel and some ICT advances in agriculture on UBC
https://youtu.be/S03-UpcXW_s

Keywords

Soil organic matter, sustainable land management , nutrient use efficiency , modelling