

**Dr. Michael Owor**

Department of Geology & Petroleum Studies, School of Physical Sciences, College of Natural Sciences, Makerere University  
P.O. Box 7062, Kampala, Uganda

Email: michael.owor@mak.ac.ug  
Tel: +256 772 625 149 / +256 700 577 992

**i. Career details**

- Since Nov 2021, Associate Professor, Dept. of Geology & Petroleum Studies, Makerere University.
- Since Oct 2015, Head / Chair, Dept. of Geology & Petroleum Studies, Makerere University, Uganda.
- Apr 2013 - Jun 2014, Ag. Chair, Dept. of Geology & Petroleum Studies, Makerere University, Uganda.
- Jul 2010 - Oct 2021, Senior Lecturer, Dept. of Geology & Petroleum Studies, Makerere University.
- Jun 2001 - Jun 2010, Lecturer, Dept. of Geology & Petroleum Studies, Makerere University.
- Apr 1997 - May 2001, Assistant Lecturer, Dept. of Geology & Petroleum Studies, Makerere University.
- Oct 1994 - Mar 1997, Teaching Assistant, Dept. of Geology & Petroleum Studies, Makerere University.

**ii. Academic and professional qualifications**

*Educational*

- 2006 - 2010, PhD Groundwater-surface water interactions, University College London, UK
- 2002 - 2006, PhD Environmental Geohydrology, Makerere University, Kampala, Uganda
- 1998 - 2000, MSc Water Resource Surveys (Distinction), ITC, Enschede, The Netherlands
- 1991 - 1994, BSc Geology and Chemistry (2.1 Hons), Makerere University, Kampala, Uganda

*Professional*

- Mar 2013, Certificate on National Training on Advanced Isotope Hydrology, Makerere University, Kampala, Uganda.
- Apr 2011, Certificate on Trainers in the Use of ICT Teaching Materials in the Water Resources Management, Nuclear Research Centre of Algiers, Algiers, Algeria.
- Safe Water Summit 2010: new solutions to real needs. 29 September - 1 October, 2010, Copenhagen. Organised by Danish Red Cross, Copenhagen, Denmark.
- Dec 2010, Certificate on National Training on Basic Isotope Hydrology, Makerere University, Kampala, Uganda.
- 6 - 10 Apr 2008, Surface-Ground Water Interaction: From Watershed Processes to Hyporheic Exchange, FIVA International PhD Course, International Research School of Water Resources, University of Copenhagen, Denmark.
- Feb - Mar 2006, Certificate on Modern Data Acquisition and Processing Tools for Integrated Water Resources Management, Addis Ababa University, Ethiopia and ITC, Netherlands.
- Feb - Mar 2005, Certificate on Statistical Methods and Computer Applications in Research, Makerere University, Kampala, Uganda.
- 25 Aug 2005, Pedagogy for higher education lecturers, School of Education, Makerere University Uganda.
- 11 - 15 Oct 2004, Pedagogical Training Workshop for Teachers of higher institutions of learning, School of Education, Makerere University, Uganda.

- May - Jun 2004, Certificate on 14th United Nations International Training Programme on Remote Sensing Education for Educators, Stockholm University, Stockholm, Sweden.
- Sep 2002, Certificate on Capacity Building and Policy Development in E-learning in Higher Education: Trainer of Trainers (TOTII) course, Makerere University, Kampala, Uganda.
- Apr - May 1997, Certificate on Nuclear Analytical Techniques in Mineral Exploration, Centre for Energy Research and Training (CERT), Ahmadu Bello University, Zaria, Nigeria.
- Apr - Nov 1995, Postgraduate Diploma on Advanced Groundwater Resources Management, Institute for Groundwater Studies (IGS) University of Orange Free State Bloemfontein, South Africa.

### iii. Publications

- Jacintha Gumoteyo Nayebare, Michael M. Owor, Robinah Kulabako, and Richard Graham Taylor (accepted). Faecal contamination pathways of shallow groundwater in low-income urban areas: implications for water resource planning and management. *Water Practice & Technology* Vol 00 No 0, 1 doi: 10.2166/wpt.2021.110.
- James P.R. Sorensen, Jacintha Nayebare, Andrew F. Carr, Robert Lyness, Luiza C. Campos, Lena Ciric, Timothy Goodall, Robinah Kulabako, Catherine M. Rushworth Curran, Alan M. MacDonald, Michael Owor, Daniel S. Read, Richard G. Taylor. (2021). In-situ fluorescence spectroscopy is a more rapid and resilient indicator of faecal contamination risk in drinking water than faecal indicator organisms. *Water Research* 206 (2021) 117734, <https://doi.org/10.1016/j.watres.2021.117734>.
- Guma, B.E., Muwanga, A. and Owor, M. (2021). Hydrogeochemical evolution and contamination of groundwater in the Albertine Graben, Uganda. *Journal of Environmental Earth Sciences* 80, 303 (2021). <https://doi.org/10.1007/s12665-021-09587-6>.
- Owor, M, Muwanga, A., Tindimugaya, C. and Taylor, R.G. (2021). Hydrogeochemical processes in groundwaters of Uganda: a national - scale analysis. *Journal of African Earth Sciences*. Volume 175, March 2021, 104113. <https://doi.org/10.1016/j.jafrearsci.2021.104113>.
- Eddie W. Banks, Peter G. Cook, Michael Owor, Joseph Okullo, Seifu Kebede, Dessie Nedaw, Prince Mleta, Helen Fallas, Daren Gooddy, Donald John Mac Allister, Theresa Mkandawire, Patrick Makuluni, Chikondi E. Shaba and Alan M. Mac Donald (2020). Environmental tracers to evaluate groundwater residence times and water quality risk in shallow unconfined aquifers in sub Saharan Africa. *Journal of Hydrology*, Available online 17 November 2020, 125753. <https://doi.org/10.1016/j.jhydrol.2020.125753>.
- James P. R. Sorensen, Andrew F. Carr, Jacintha Nayebare, Djim M. L. Diongue, Abdoulaye Pouye, Raphaëlle Roffo, Gloria Gwengweya, Jade S. T. Ward, Japhet Kanoti, Joseph Okotto-Okotto, Laura van der Marel, Lena Ciric, Seynabou C. Faye, Cheikh B. Gaye, Timothy Goodall, Robinah Kulabako, Daniel J. Lapworth, Alan M. MacDonald, Maurice Monjerezi, Daniel Olago, Michael Owor, Daniel S. Read and Richard G. Taylor (2020). Tryptophan-like and humic-like fluorophores are extracellular in groundwater: implications as real-time faecal indicators. *Nature Scientific Reports*. (2020) 10:15379. <https://doi.org/10.1038/s41598-020-72258-2>.
- Lapworth DJ, MacDonald AM, Kebede S, Owor M, Chavula G, Fallas H, Wilson P, Ward JST, Lark M, Okullo J, Mwathunga E, Banda S, Gwengweya G, Nedaw D, Jumbo S, Banks E, Cook P and Casey V. (2020). Drinking water quality from rural handpump-boreholes in Africa. *Environmental Research Letters* 15 (2020) 064020.
- Cuthbert et al. (2019). Observed controls on resilience of groundwater to climate variability in Africa. *Nature*, Vol 572, 8 August 2019. <https://doi.org/10.1038/s41586-019-1441-7>.
- Guma, B., Owor, M. and Muwanga, A. (2019). Hydrogeological characteristics of the Albertine Graben, Uganda: evidence from geophysical and hydraulic testing. *Journal of African Earth Sciences*, 150, 224-238.

- Maurice, L., Taylor, R.G., Tindimugaya, C., MacDonald, A.M., Johnson, P., Kaponda, A., Owor, M., Sanga, H., Bonsor, H.C., Darling, W.G. and Gooddy, D. (2019). Characteristics of high-intensity groundwater abstractions from weathered crystalline bedrock aquifers in East Africa. *Hydrogeology Journal*, 27, 459-474. <https://doi.org/10.1007/s10040-018-1836-9>.
- Mackinnon, E., Ayah, R., Taylor, R., Olago, D., Kulabako, R., Tal Dia, A., Ssempebwa, J., Owor, M., Gaye, C.B., Campos, L.C. and Fottrell, E. (2018). 21st Century research in urban WASH and health in sub-Saharan Africa: methods and outcomes in transition. *International Journal of Environmental Health Research*, doi.org/10.1080/09603123.2018.1550193.
- Shamsudduha, M., Taylor, R. G., Jones, D., Longuevergne, L., Owor, M., and Tindimugaya, C. (2017). Recent changes in terrestrial water storage in the Upper Nile Basin: an evaluation of commonly used gridded GRACE products, *Hydrological Earth System Sciences*, 21, 4533-4549, <https://doi.org/10.5194/hess-21-4533-2017>, 2017.
- Schagerl, M. (Ed.) (2016). Soda Lakes of East Africa. Woldegabriel, G., Olago, D., Dindi, E. and Owor, M., Chapter 2, Genesis of the East African Rift Valley. Springer International Publishing, DOI: 10.1007/978-3-319-28622-8, 290p.
- Nieder, R., Weber, T.K.D., Paulmann, I., Muwanga, A., Owor, M., Naramabuye, F., Gakwerere, F., Biryabarema, M., Biester, H. and Pohl, W. (2014). The geochemical signature of rare-metal pegmatites in the Central Africa Region: Soils, plants, water and stream sediments in the Gatumba tin-tantalum mining district, Rwanda. *Journal of Geochemical Exploration*, doi: 10.1016/j.gexplo.2014.01.025.
- Owor, M., Taylor, R.G., Mukwaya, C. and Tindimugaya, C. (2011). Groundwater - surface water interactions on deeply weathered surfaces of low relief: evidence from Lakes Victoria and Kyoga. *Hydrogeology Journal*, 19, 1403-1420.
- Batte, A.G., Barifaijo, E., Kiberu, J.M., Kawule, W. Muwanga, A. Owor, M. and Kisekulo, J. (2010). Correlation of Geoelectric Data with Aquifer Parameters to Delineate the Groundwater Potential of Hard rock Terrain in Central Uganda. *Pure and Applied Geophysics*, 167(12), 1549-1559.
- Muwanga, A., Oryem-Origa, K., Makara, A., Hartwig, T., Ochan, A., Owor, M., Zachmann, D. and Pohl, W. (2009). Heavy metals and their uptake by plants in the River Nyamwamba-Rukoki-Kamulikwezi-Lake George system, Western Uganda. *African Journal of Science and Technology*, 10(2), 60-68.
- Owor, M., Taylor, R.G., Tindimugaya, C. and Mwesigwa, D. (2009). Rainfall intensity and groundwater recharge: empirical evidence from the Upper Nile Basin. *Environmental Research Letters*, 4 (2009) 035009 (6pp). doi:10.1088/1748-9326/4/3/035009.
- Taylor, R., Tindimugaya, C., Owor, M. and Shamsudduha, M. (Eds.) (2009). Groundwater and Climate in Africa. International Association of Hydrological Sciences (IAHS) Publication 334, 260p.
- Batte, A.G., Muwanga, A. and Sigrist, P.W. and Owor, M. (2008). Vertical electrical sounding as an exploration technique to improve on the certainty of groundwater yield in the fractured crystalline basement aquifers of eastern Uganda. *Hydrogeology Journal*, 16, 1683 – 1693.
- Barifaijo, E., Owor, M. and Erima, G. (2008). Enrichment characteristics in the upper mantle xenoliths from the Bufumbira basaltic rocks, southwestern Uganda. *African Journal of Science and Technology, Science and Engineering Series*, 9(1), 85-101.
- Owor, M., Muwanga, A. and Pohl, W. (2007). Wetland Change Detection and Inundation north of Lake George, western Uganda using Landsat Data. *African Journal of Science and Technology: Science and Engineering Series*, 8(1), 94-106.
- Owor, M., Hartwig, T, Muwanga, A., Zachmann, D. and Pohl, W. (2007). Impact of tailings from the Kilembe copper mining district on Lake George, Uganda. *Environmental Geology*, 51(6), 1065-1075.

- Hartwig, T, Owor, M., Muwanga, A., Zachmann, D. and Pohl, W. (2005). Lake George as a sink for contaminants derived from Kilembe copper mining area, western Uganda. *Mine Water and the Environment*, 3(24), 114-123.

#### iv. Teaching

Since 1995 to date (>24 years) experience teaching, conducting laboratory practical and field classes for various courses and more recently:

- *Undergraduate*: Crystallography; Exogenic Natural Hazards (yr I); Hydrogeology (yr II); Water Quality and Instrumentation (yr III); Supervision of students Industrial Attachment (yr II) and geological field classes (yr I - III).
- *Graduate*: Advanced Hydrogeology; Research Methods; (MSc I).

#### v. Research

- Co-PI, Jan 2015 - Mar 2022; Sustaining urban groundwater-fed water supplies and sanitation systems in Africa. Funded by the Royal Society-DFID Capacity Building Initiative, UK.
- Co-PI and Coordinator, MakRIF 2019-2021; An assessment to identify research and training laboratory and field equipment and infrastructure for petroleum geosciences and engineering in Higher Educational Institutions of Uganda. Government of Uganda.
- National Consultant, 30 Oct 2018 - 31 Mar 2019; Enhancing conjunctive management of surface and groundwater resources in selected transboundary aquifers: case study for selected shared groundwater bodies in the Nile Basin – project preparation. Nile Basin Initiative Secretariat.
- Research Fellow, 1 Sept - 6 Oct 2018; British Geological Survey, Edinburgh, Scotland.
- Co-PI, 2014-2019; Research Consortium Grant on Sustaining urban groundwater-fed water supply and sanitation systems in Africa, being carried out in Uganda, Kenya and Senegal, funded by the Royal Society and DFID, UK.
- Co-PI, 2015-2019; Research Consortium Grant on A hidden crisis: unravelling current failures for future success in rural groundwater supply carried out in Uganda, Malawi and Ethiopia, funded by the Unlocking the Potential for Groundwater for the Poor in Sub-Saharan Africa (UPGro), funded by Natural Environment Research Council (NERC), UK.
- Co-PI, Jan - Dec 2014; Development of Shared Groundwater resources in the Mt. Elgon Region under conditions of Climate Variability and Change. IGAD Inland Water Resources Management Programme (IGAD-INWRMP) Research Grant Program on Integrated River Basin Management, Makerere University and Nairobi University.
- PI, Sep 2013 - Dec 2013: Groundwater recharge in Uganda. Commonwealth Research Fellow at University College London, Commonwealth Research Commission in the United Kingdom.
- Co-PI, Sep 2013 - Oct 2014: Sustaining urban water-fed groundwater supplies and sanitation systems in Africa (AN130031). Royal Society/DFID Africa Capacity-Building Initiative, Draft Scientific Network Award Proposal.
- National expert, Mar 2011 - Mar 2012; Mainstreaming groundwater consideration into the integrated management of the Nile River Basin. Funded by IAEA, Vienna, Austria.
- Co-investigator, 2012-2014; Groundwater Resource in Basement rocks of Africa (GRIBA) carried out in Benin, Burkina Faso and Uganda funded by Africa Union and European Union.
- Co-Investigator, 2010-2013; Sustainable Restitution/Recultivation of Artisanal Tantalum Mining Wasteland in Central Africa: Spatial mapping of degraded mining areas from toxic elements in soils, sediments and water in Central Africa funded by Volkswagen Stiftung (Germany).
- Co-Investigator, 2010-2011; Enhancing Water for Food: poverty reduction through improved management of ecosystem services for sustainable food production in sub-Saharan Africa funded by Natural Environment Research Council, UK.

- Co-Investigator, 2010-2011; Climate change and groundwater project: Resilience of intensive groundwater abstraction from weathered crystalline rock aquifer systems to climate change in Africa funded by DFID, UK.
- PI, 2006-2010; Groundwater - surface water interactions on deeply weathered surfaces of low relief: evidence from Lakes Victoria and Kyoga funded by the Commonwealth Staff Scholarship, University of London Central Research Fund; University College London Graduate School Research Projects Fund; Dudley Stamp Memorial Fund.
- PI, 2007 - 2009: Research support for Monitoring and modelling of the interactions between groundwater and surface water in the Victoria Nile Basin of Uganda funded by the International Foundation for Science (IFS), Sweden.
- PI, 2003-2004: An Environmental Geohydrologic Evaluation of the Lake George Wetlands as a Natural Barrier Against the Migration of Heavy Metals Derived from the Kilembe Mines funded by the International Foundation for Science (IFS), Sweden.

▪ **Conference/seminars**

- Owor et al. (2019). Permeability of the crystalline basement in Uganda - evidence from approximately 600 pumping tests and implications for solar pumping, IAH Congress 2019, Malaga, Spain.
- Owor et al. (2019). Geochemical footprints in the groundwaters of Uganda: a national-scale analysis, Groundwater Quality Conference, Liege, Belgium;
- Nayebare, G.J., Owor, M., Kulabako, R., Ssempebwa, J. and Taylor, R.G. (2016). Sustaining urban groundwater-fed water supplies and sanitation systems in Africa- case study of Lukaya, Uganda, 43<sup>rd</sup> International Association of Hydrogeologists (IAH) Congress, 25-29 September 2016, Montpellier, France.
- Owor, M., Taylor, R.G., Tindimugaya, C. and Pule, J. (2015). Quantifying groundwater recharge in deeply weathered crystalline rocks in the Upper Nile Basin: evidence from observations and modelling, 42<sup>nd</sup> International Association of Hydrogeologists (IAH) Congress, 13-18 September 2015, Rome, Italy.
- Owor, M., Taylor, R.G. and Thompson, J. (2009). Monitoring of the groundwater - surface water interactions in the Upper Nile basin of Uganda - Recent findings. Joint International Convention of the 8th IAHS Scientific Assembly and 37th IAH Congress: Water: A vital resource under stress - How science can help, 6-12, September, 2009, Hyderabad, India.
- Owor, M., Taylor, R.G., Tindimugaya, C., Mwesigwa, D. and Bradley, G. (2009). Rainfall intensity and groundwater recharge: empirical evidence from the Upper Nile Basin. Groundwater recharge Assessment Meeting – Are we any closer to an answer? 20-21, May, 2009, University of East Anglia, Norwich, U.K.
- Owor, M., Taylor, R.G., Tindimugaya, C. and Mukwaya, C. (2009). Monitoring groundwater - surface water interactions in the Upper Nile basin of Uganda - Preliminary results. International conference on Groundwater and Climate in Africa, 24-28, June, 2008, Kampala, Uganda.
- Owor, M., Hartwig, T., Muwanga, A., Zachmann, D. and Pohl, W. (2007). Heavy metal speciation and loading of Lake George since the pre-mining period of the old Kilembe copper mine, western Uganda. Abstract volume of the International conference on the East African Rift System (EARS), 23-25, July, 2007, Kampala, Uganda.
- Owor, M., Hartwig, T., Muwanga, A., Zachmann, D. and Pohl, W. (2005). Findings of the environmental geohydrologic evaluation of the Lake George wetlands as a natural barrier against the migration of heavy metals derived from the Kilembe copper mine. Proceedings of the Science for Humanity Conference of the International Science Congress (ISC) 2005, 3-6, August, 2005, Putra World Trade Centre, Kuala Lumpur, Malaysia.
- Owor, M., Hartwig, T., Muwanga, A., Zachmann, D. and Pohl, W. (2004). Preliminary Findings of the Lake George Wetlands as a Natural Barrier against the migration of Heavy Metals derived from the Kilembe Copper mine. Proceedings of the international conference on The East

African Rift System: Geodynamics, Resources, and Environment, 20-24, June, 2004, United Nations Conference Centre, Addis Ababa, Ethiopia.

- Owor, M. (2000). The long-term interaction of groundwater with Lake Naivasha, Kenya - A numerical simulation. Proceedings of the Geological Society of Kenya (GSK) conference, 16-19, November, 2000, Nairobi, Kenya.

**vi. Community outreach**

- Technical committee, Uganda Water and Environment Week, Entebbe, 18-22 March 2019.
- Member, since Jun 2019; National Oil and Gas Sector Skills Council of the Ministry of Education and Sports.
- Organised the UPGro annual project meeting, 5-8 February 2018, Kampala, Uganda.
- Organised the AfriWatSan research project Training Workshop from 10th to 15th July 2016 at Makerere University, Kampala Uganda for participants from Senegal, Kenya, UK and Uganda.
- Member, since Jan 2016; National Task team to set criteria and evaluate applications for registration of Hydrogeologists and hydrogeological companies, Ministry of Water and Environment.
- Member, Dec 2012-2016; National Committee of the International Geosciences Programme (IGCP).
- Editorial Committee of the Proceedings of the International conference on Groundwater and Climate in Africa, 24-28 June 2008, Kampala, Uganda.
- Editorial and Secretariat Committees, International conference on the East African Rift System (EARS), 23 – 25, Jul 2007, Kampala, Uganda.
- Secretariat Committee, Regional conference of the Geological Society of Uganda/Geological Society of Africa, 10 - 12, Sep 2001, Kampala, Uganda.
- Since 2002, Community outreach involving the development of groundwater resources and evaluation of the environmental impact by various anthropogenic activities on water, soils and geology in several districts of Uganda.
- Co-Editor, 1999 – 2001; The Geological Society of Uganda (GSU) Newsletter.

Dated: **23 November 2021**