
Curriculum Vitae

Name : **Prof. Dr.** FRANCIS ORATA OMOTO
Nationality : Kenyan
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SUMMARY

Associate Professor and Researcher in the Department of Pure and Applied Chemistry at Masinde Muliro University of Science and Technology (MMUST). Currently serving as the Director of Research and Postgraduate Support at MMUST. I completed postdoctoral research at Stockholm University in Sweden, focusing on Applied Environmental Science, and at the University of Duisburg-Essen in the Department of Instrumental and Analytical Chemistry. I earned my PhD from Johannes Gutenberg University in Mainz, Germany, in 2009, funded by a DAAD Full Scholarship. During my doctoral studies, I collaborated with IWW Rheinisch-Westfälisches Institut für Wasserforschung gemeinnützige GmbH in Biebesheim, Germany, a well-regarded institute specializing in water and engineering research. Attraction of external research grants from various grantors worth over KES 600 Million (approx. KES 4.6 million dollars).

My research interests encompass Environmental Chemistry, Chemical Toxicology, Climate Change, Future Energy Solutions, Wastewater Treatment Technologies, Remediation and Degradation of Persistent Organic Pollutants, and Analysis of Chemicals in Various Matrices with a focus on their toxicological implications.

Additionally, I hold the position of Chief Editor for the Journal of Advances in Science, Engineering, and Technology (JAdSET) and am the Program Leader for Industrial Chemistry at MMUST.

Field of Chemistry: Associate professor and researcher in *Environmental & Toxicological Chemistry*

Teaches: Environmental & Toxicological chemistry, Inorganic Chemistry, Industrial chemistry, Physical chemistry, Analytical Chemistry

EDUCATIONAL BACKGROUND

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| 2014 - | Post Doc/Guest researcher. | Electrochemical degradation of PFAAs |
| 2015 | Department of Instrumental & Analytical Chemistry, Duisburg-Essen University: Germany | |
| 2011 - | Post Doc/Guest researcher. | Exposure to Perfluorinated carboxylates (PFCAs) and |
| 2012 | Department of Applied Environmental Science (ITM), Stockholm University, Sweden | Perfluorinated sulfonates (PFSAs) |
| 2006 - | Ph.D. Chemistry, Johannes Gutenberg-Universität, Mainz, Germany | " Perfluorinated compounds and Degradation Studies of Emerging Perfluorinated Surfactants Substitutes". Supervisor, Prof: Dr. Rolf-Dieter Wilken, Prof. Hoffmann, Thorsten |
| 2000 - | M.Sc. Environmental Chemistry, University of Nairobi, Nairobi, Kenya | Determination of Heavy Metals in sediments, Plants and Fish in Winam Gulf of Lake Victoria. Supervisors, Dr. J.M. Onyari and Prof. S.O. Wandiga. |
| 1994 - | B.Sc. Chemistry, University of Nairobi, Nairobi, Kenya | Heavy Metals along Nairobi River". Supervisor. Prof. G. Kamau. |

TEACHING EXPERIENCE

- 2014 to date Masinde Muliro University of Science and Technology, Kakamega, Kenya. Pure and Physical Chemistry Department. Lecturer; Postgraduate; Environmental, toxicology, Analytical, Inorganic courses. Undergraduate: Environmental & Toxicological chemistry, Inorganic Chemistry, Industrial chemistry, Physical chemistry, Analytical Chemistry
- 2006 - 2009 Johannes Gutenberg-Universität, Mainz, Germany. Department of Chemistry, Pharmacy and Geological studies. Water purification processes.
- 2001 - 2004 University of Nairobi, Nairobi, Kenya. Chemistry department, University of Nairobi. Laboratory classes and tutorial courses in Physical and Inorganic chemistry

WORK EXPERIENCE & APPOINTMENTS

- 2023 to date Director, Research and Postgraduate Support, Masinde Muliro University of Science and Technology.
- 2024 to date Acted Deputy Vice Chancellor, Planning, Research and Innovations, occasionally.
- 2023 to date Member of the Institutional Scientific and Ethics Review Committee
- 2022 to date Appointment as External Examiner for chemistry exams, at Bomet University, Kenya.
- 2022 to date Appointment to the Research Communication Sub-committee, the East African Regional Research and Development Working Group, East African Community.
- 2021 to date Director, Board Kakamega County Rural Water and sanitation Company (KACRWASCO); Chair of the Technical Committee.
- 2018- to date Kenya Bureau of Standards (KEBS): Sat on Water and Sanitation Technical Committees on Standard Specifications.
- 2014 to 2020 Head of Department (HOD) Department of Chemistry, Masinde Muliro University of Science and Technology (Kenya)
- 2014 to 2020 Masinde Muliro University of Science and Technology (Kenya). Capacity: Senior Lecture and Researcher.
- 2010 to 2014: Masinde Muliro University of Science and Technology (Kenya). Capacity: Lecture and Researcher.
- 2013 to 2015 Ministry of Environment and Natural Recourses: Capacity: Lead expert and Consultant. GOK/GEF WORLDBANK project on updating the Kenya national Implementation Plan for the Stockholm Convention on Persistent Organic Pollutants.
- 2012 - 2013 Department of Applied Environmental Science (ITM), Stockholm University, Sweden
- 2006 - 2009 University of Mainz (Germany). Capacity: Lecturer and Researching
- 2001 - 2004 University of Nairobi. Capacity: Tutor (graduate assistant)
- 1999 - 2001 Pharmaceutical Manufacturing Company. Capacity: Assistant quality Control Manager
- 1999 Kel Chemicals Company. Capacity: Analyst and Researcher

CAREER ACHIEVEMENTS IN SERVING IN VARIOUS POSITIONS

Period	Position	Achievement
2025 to date	Chairperson, Board of Management, Mumias East Technical and Vocational Training Collage (MWTC).	Attraction of a 350 capacity hostels at MWTC in line with the Kenya Government Affordable Housing Program aims to bridge the housing deficit, and I as chairperson of Board of Governors. Spearheaded the renovation and fencing of the collage with a new gate. Solarizing the institution.
2023 to date	Director, Research and Postgraduate Support, Masinde Muliro University of Science and Technology.	<ol style="list-style-type: none"> I. Established a Grants Management Office at Masinde Muliro University of Science and technology (MMUST) II. Increased the External Grants received by MMUST from an average of KES 30 million annually (before 2023) to over KES 150 million annually (2023-2025) after I took office, and now (2026) to KES 700 million in year 3 (2026). For the first time, MMUST obtained a grant of ½ a billion during my tenure in office. III. Certificate of Compliance: Led MMUST to be certified for Good Financial Grant Practices at GOLD tier level, audited by KPMG IV. Establishment of MMUST Journals that had not been achieved by the time I took office: <ul style="list-style-type: none"> • Jarida la Kiswahili Sanifu (JAKISA) • Journal of Advances in Science, Engineering and Technology (JAdSET) <p>Upcoming journals</p> <ul style="list-style-type: none"> • Journal of Education, Business and Social Sciences • Journal of Advances in Health and Medicine (JAHM) • International Journal for Disaster Management and Risk Reduction
2022 to date	Appointment as External Examiner for chemistry exams, at Bomet University, Kenya.	Improved the exams moderation process by introducing a tool for documentation of the process
2021 to date	Director, Board Kakamega County Rural Water and sanitation Company (KACRWASCO); Chair of the Technical Committee.	Pioneering the establishment of KACRWASCO and increasing its revenue by a factor of five in 5 years. Connecting water increase by a factor of 10 from previous connections. Evaluated at 98 % (2023/2024) performance achievement approval by the government, through the State Corporations Advisory Committee (SCAC).
2014 to 2020	Head of Department (HOD)	1. Established the departmental income generating unite; the personal care products at MMUST.

	Department of Chemistry, Masinde Muliro University of Science and Technology (Kenya)	<ol style="list-style-type: none"> 2. Establish unique programs namely; <ul style="list-style-type: none"> ➤ Bachelor of Technology in Cosmetology and Beauty ➤ Bachelor of Industrial Chemistry ➤ Established the PhD program 3. Initiator of the Presidential Award scheme at MMUST.
2014 to date	Lead expert and Consultant. GOK/GEF WORLDBANK project on updating the Kenya national Implementation Plan for the Stockholm Convention on Persistent Organic Pollutants.	The team that delivered the first Kenyan NIP. Helped Kenya file report of the newly listed POPs.

TRAINING, WORKSHOPS, PROFESSIONAL STUDIES

19 th – 23 rd Jan 2026	Madiba Nexus Workshop: Advancing Balanced North–South Research Partnerships. At Nelson Mandela University, Port Elizabeth, South Africa.
22 nd - 25 th Sept 2025	7th EARIMA Annual Conference, at the Protea Hotel, Entebbe, Uganda. The theme: “Driving Research and Innovation for Socio-Economic Transformation.”
22 nd - 26 th Sept 2025	GGP-VA Proposal Writing Workshop, Entebbe, Uganda
30 th - 4 th Oct 2024	African Population and Health Research Center (APHRC). Grant Writing Workshop for Kenyan Universities. Kenya School of Governance. Catalyze Impact Initiative Grants Proposal Writing Training Workshop.
15 th – 17 th July 2024.	National Stakeholders Engagement on Research Ecosystem. Organized by the Ministry of Education, State Department for Higher Education & Research. Lake Naivasha Resort.
27 th – 30 th May 2024	School of Chemical Sciences, Universiti Sains, Malaysia. Developing Nanocomposite.
8-11 Feb 2024	Middle East & North Africa Clinical Toxicology (MENATOX) .Annual Conference 8-11 February at the Novotel Al Bustan, Abu Dhabi, UAE.
16-19th April 2024	COHESA Kenya Sandpit. Sandpit Event on developing innovative solutions to curb antimicrobial resistance, zoonoses and environmental degradation in Kenya. Jacaranda Hotel Nairobi.

15 - 16 th April 2024	GCRF International Networking Workshop at the Grand Royal Swiss Hotel, in Kisumu, Kenya
1 - 2, 2023, Feb	Knowledge Security Beyond Cybersecurity, Training Workshop. By CTR and Pacific Northwest National Laboratory (PNNL). In Nairobi, Kenya.
15 th -21 st Nov 2022	International Exchange on Distant, Blended, and Online Education and Learning. Westsächsische Hochschule Zwickau - University of Applied Sciences Zwickau, Germany.
7 th June- 4 th July, 2021.	Certificate of Accomplishment of Pedal Online: Technology for Transformative Pedagogy Course. Partnership for African Social and Governance Research (PASGR)
14 th June - 1 st Aug. 2021	Certificate of Competence, Research Grants and Contracts Management. Faculty of Commerce, Law & Management, School of Business sciences. Certificate of Competence from the University of the Witwatersrand.
4 th – 8 th Oct 2021	International DAAD Alumni Advanced Training Seminar “Water in Africa in Balance with Human Needs and Nature”. Topics: Clean Water, Clean Energy, Circular Economy, and a Panel discussion about water in Africa: Status-quo, challenges, future? Participation in the digital training seminar. Organized and hosted by TU Bergakademie Freiberg, Germany.
1 st - 14 th Oct 2019	Bioresources, Biomass, Biogas, Climate Change. Leibniz-Institut für Agrartechnik und Bioökonomie e.V. (ATB), Max-Eyth-Allee 100, D-14469 Potsdam, Germany.
30 th April - 2 nd May, 2019	Sustainable Chemical Security and Substitution Workshop, Naivasha, Kenya, by Kenya Chemical society.
17 th - 26 th Jan 2018.	Catalysis and its Application. Masinde Muliro University of Science and technology, Kakamega, Kenya.
18 th – 22 nd Dec. 2018	Invitation to workshop to review recommended amendments to the Stockholm Convention Annex. Simba lodge, Naivasha, Kenya
10 th April, 2018.	Workshop on mainstreaming sound chemicals management & solid waste Management awareness. Golf hotel, Kakamega,
17 th - 18 th Oct. 2017	Workshop on the Role of Universities in Mainstreaming Sound Chemicals Management in National Development Agenda, At Hotel Sarova Woodland, Nakuru, Kenya
12 th July 2018.	University Leaders Chemical Security Awareness Workshop at the <u>Crowne Plaza Hotel</u> , Nairobi, Kenya.
17 – 20, Nov.	Workshop on Chemical Inventory Management Systems (CIMS). Wigot Hotel,

2017.	Kisumu, Kenya.
04-07, July 2017.	Chemical Security Vulnerability Assessments Training in Western Kenya, Venue: Shalom Hotel, Kisumu, Kenya.
12-13 May 2016	National Workshop on the overview of trends in teaching and research in inorganic Chemistry and its applications in Nairobi, Kenya
July 24 th - 27 th . 2013.	Scientific papers writing workshop. Organized by, KDSA/DAAD. Kenyatta University.
July 1 st - 4th. 2013.	Training workshop on Inventories for chemical pollutants. Organized by Ministry of Environment Water and Natural resources. Isaak Wanton Hotel, Embu Kenya.
March – April 2013	International DAAD-Alumni-Summer School at the University of Oldenburg. “Water, energy and sanitation in urban and decentralized regions”. Postgraduate Programme University of Oldenburg, Germany.
30-31 Oct 2012.	KODI - Open Data Incubator Project – outreach to research community sensitization workshop on open data. Organized by DAAD, KDSA, Kenya ICT Board, World Bank, the National Council for Science and Technology (NCST). ICIPE, Nairobi.
March - April, 2012	Modelling of Environmental Pollutants I: Partitioning, Transport, and Exposure (advanced course). Department of Applied Environmental Science (ITM), Stockholm University.
22 nd -25 th June, 2010.	Regional Facilitators Workshop on Information Literacy. Kenyatta University Conference Centre. Nairobi, Kenya.
6 th -7 th May, 2010	E-Resources Training Workshop: TEEAL-RESEARCH4LIFE AND PROTA. ITOCA. Masinde Muliro University of Science and Technology. Kenya.
Aug - Sept., 2007	Sustainable use of Natural resources: organised by UNEP. China, Tongji University, Shanghai, China
2 - 12 th Aug 2004	Pesticides in the Environment: Courses covered; Mode of action of Pesticides in Human, Toxicology, Stockholm connection, Transport dynamics of pesticides, Pesticides formulation, Incineration of pesticides. Venue: Arusha, Tanzania.
8 - 19 th Sept, 2003	Analysis of Pesticides in the Environment: Courses covered; Methods in Pesticides analysis, types of pesticides, Pesticides partitioning in the ecosystem. Venue: Nairobi.
22 - 25 th Aug. 2001	Chromatographic separation techniques, NMR – Mass Spectroscopy: Courses covered; Methodologies used in natural products analysis and structural determination. Venue: Nairobi.
7 th - 11 th May, 2001	Theoretical Chemistry workshop. Venue: University of Nairobi.

PRESENTATIONS AND ATTENDANCE OF INTERNATIONAL AND LOCAL CONFERENCES

- Capacity-Building Workshop on Gender Equity, Inclusivity and Intersectionality (GEII) in Research scheduled for 15th to 16th May 2025 at The Kisumu Hotel, Kisumu.
- Agenda for the Good Grant Practices Virtual Academy Program Inception Workshop Venue: Mövenpick Hotel & Residences N. Organized by APHRC. 2025 Nairobi
- National Stakeholders Engagement on Research Ecosystem. Organized by the Ministry of Education, State Department for Higher Education & Research. Naivasha Resort. 15th – 17th July 2024.
- Presentation Theme. Powering Africa Sustainably. “*The need for transition from fossil fuels to renewable energy, and the Potential for transformation of fossil fuels to clean energy*”. DAAD Alumni Workshop – 4 th - 6 th. September 2024, Hosted By Bomet University College. **Presented**
- Public Lecture: Presented at Universiti Sains, Malaysia on 28th May 2024. Topic: *Chemicals of Emerging Concern in Water; Challenges of Wastewater Treatment in Low and Middle Income Countries*. Sponsored by the Royal Society of Chemistry.
- Convener and presenter in 17th International Multidisciplinary Blended Conference, 2024. 15th – 17th may 2024 at Masinde Muliro University of science and technology. Theme: Harnessing Frontier Research in Science, Technology and Innovation for Sustainable Development. Topic of presentation. Francis Orata: *Emerging Toxicants in Everyday life: Pathways to Adverse Health Effects*.
- Presentation in COHESA Kenya Sandpit. Sandpit Event on developing innovative solutions to curb antimicrobial resistance, zoonoses and environmental degradation in Kenya. Jacaranda Hotel Kakamrga. Presented on: “*Containment Protocol for Antibiotic Resistant Genes in Cattle Farm Environments using HACCP*“. 16-19th April 2024.
- Organised: Project: “*UK-Africa Network to Strengthen Environmental Initiatives to Monitor and Control Antimicrobial Resistance (AMR) Spread in Lake Victoria Basin*” is funded by the UK Academy of Medical Sciences Global Challenges Research Fund Networking Grant Scheme (GCRFNGR8\1143). GCRF International Networking Workshop at the Grand Royal Swiss Hotel, in Kisumu, Kenya 15 - 16th April 2024

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- Participated in Middle East & North Africa Clinical Toxicology (MENATOX) .Annual Conference 8-11 February at the Novotel Al Bustan, Abu Dhabi, UAE.
 - Participated in the International Exchange on Distant, Blended, and Online Education and Learning. Online Educa Berlin (OEB) conference and Exhibition. 22nd - 26th November 2022.
 - Organization and participation in the 15th international multi-disciplinary blended conference. Kenya Chemical Society (KCS). Title: “Assessment of Environmental Sources, Levels & Distribution of Polycyclic Aromatic Hydrocarbons within Nzoia Catchment Area in Kenya”. Theme: Sustainable development through green chemistry, innovation and technology. Thursday, 23rd – Friday, 24th May 2022. Kisumu, Kenya.
 - Participation in the West African Clean Energy & Environment Trade Fair & Conference. September, 2021. (WACEE’21), DAAD in the framework of the programme DAAD Alumni Special Projects. Organized and hosted by TU Bergakademie Freiberg, Germany.
 - Participation in the digital trade fair: 29th September – 30th September 2021 organized by the Delegation of German Industry and Commerce, Ghana. 4th October – 8th October 2021.
 - The 6th AvH - Kenya "KOLLEGS" Conference, October 6th to 8th, 2021. Title “Conventional Wastewater Treatment Plants as a Discharge and Source Point for Biota Exposure to Micro-pollutants”. **Presented.**
 - Workshop, ProUniEdu-WeK, a DAAD funded project Technical University of Brandenburg. TH Brandenburg, August 8th to 14th 2021. Title, “Clean Water and Sanitation Services Crisis in Kenya, Kakamega County - Development of Ceramic based Potable water Purifier”. **Presented.**
 - Workshop, ProUniEdu-WeK, a DAAD funded project Technical University of Brandenburg. TH Brandenburg, September 23rd to 27th, 2019. Title, “Water Purification and catalysis”. **Presented**
 - Workshop on laws and policies for Chemical Management Systems towards Responsible Consumption and Production in Kenya. 7th -8th March, **2019**. Title “chemical management and related policies in Kenya”. **Presented.**
 - First International Research Congress on Knowledge Generation and Dissemination in Africa. Harnessing Research Output for Sustainable Development. 18th –21st June **2018**
Venue: Grand Royal Swiss Hotel Kisumu, Kenya. “Removal of PFAAs from Water by Electro-oxidative Degradation using Boron-Doped Diamond Electrodes (BDD) as a Possible Electrode Material” (**Presented**).
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- ANCAP symposium on pesticides and organic pollutants in environment, 1st December to 4th December **2017**, REEF Hotel Mombasa Kenya “Occurrence of Perfluoroalkyl Acids (PFAAs) and Pharmaceuticals in Sewage Sludge from Nine Waste Water Treatment Plants in Kenya”. **(Presented)**
 - The 7th International SEANAC conference 28th Nov-1st Dec **2017**, Mombasa, Kenya. Titled ‘Removal of PFAAs from Water by Electro-oxidative degradation using boron-doped diamond electrodes (BDD) as a possible electrode material.’ **(Presented)**
 - Kenya Chemical Society (KCS) hereby invite you to a training workshop: “Chemical Inventory
 - Management Systems Training for Chemical Professionals and Technicians from Universities in Western Kenya Region” to be held at Wigot Hotel, Kisumu from November 17 – 20, 2017.
 - Kenya Chemical Society (KCS). “Chemical Security Vulnerability Assessments Training in Western Kenya’. Venue: Royal City (Garden) Hotel, Kisumu. Dates: 04-07, July 2017
 - DAAD Alumni Conference “Management of Resources – Multi-disciplinary Perspectives from along the Nile” on 10th – 12th November **2016**, in Cairo, Egypt **(Presented)**
 - Inorganic Chemistry conference. A National Workshop on the overview of trends in teaching and research in inorganic chemistry and its applications in Kenya, 12-13 May **2016**. University of Nairobi **(Presented)**
 - 4th. Alexander von Humboldt. Avh-k. Perfluoroalkyl Acids in Selected Wastewater Treatment Plants and their Discharge Load within the Lake Victoria Basin in Kenya. April **2016**. Naivasha, Kenya **(Presented)**.
 - 3rd Conference on Emerging Frontiers for Sustainable Water: A Trilateral Partnership Africa-India-UK: Sunnyside Park Hotel, Johannesburg, 3-5 August **2015**. Member who attended is Dr. Francis Orata Omoto, Title of presentation: “*Per-fluorinated surfactants and pharmaceuticals as emerging pollutants within Lake Victoria drainage systems; their treatment technologies*”. **Presented.**
 - Kenya Chemical Society (KCS). Applied chemistry and technology in Industry “Bioaccumulation of perfluoroalkyl acids in dairy cows in a naturally contaminated environment. Robin Vestergren & Francis Orata & Urs Berger & Ian T. Cousin. UoN. **Presented. 2015.**
 - Annual KDSA Conference and AGM. Theme. “Kenya’s Constitutional Provisions and the Citizen’s Rights: Are we on track?” The KDSA in collaboration with the DAAD Regional Office for Africa in Nairobi. On 28th – 29th May, 2015. Nairobi, Kenya.

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- The 8th International Kenya Chemical Society Conference. Theme: Applied Chemistry and Technology in Industry: May 5th – 8th. 2015. University of Nairobi, Chiromo campus, Kenya. **Presented**
 - Inventory on PFOS, PBDEs and HBB. Training workshop on Inventories for chemical pollutants.
Organized by Ministry of Environment Water and Natural resources. Isaak Wanton Hotel, Embu Kenya. July 1- 4th. 2013.
 - International conference. African Cities of the Future: Smart, Sustainable, Participatory. KDSA, DAAD, Konrad Adenauer Stiftung, in collaboration with UN-Habitat and IFP of Ford Foundation. 30th – 31st May 2013 at The Safari Park Hotel, Nairobi, Kenya.
 - International DAAD-Alumni-Summer School at the University of Oldenburg. *Chemicals of Emerging Concern in Developing Countries: Research challenges, collaboration and cooperation with industrial countries*. “Water, energy and sanitation in urban and decentralized regions”. Postgraduate Programme University of Oldenburg, **Germany**. March – April 2013. (**Presented**).
 - Sustainable water management in African Countries Conference at Maseno University-Kisumu, Kenya, 1st - 3rd, Oct. 2012.
 - Nordfluor/NECC2012. Nordic Environmental Chemistry Conference. “*Biotransfer factors and tissue distribution of perfluoroalkyl acids in dairy cows receiving a naturally contaminated diet*”. 4th-8th June, 2012. Harjattula, **Finland**.
 - Alexander Von Humboldt International Kollege. “Synergy and Networking To Enhance Research And Development”. 23 to 26th Nov. 2010. Nairobi, Kenya (**Organized and Presented**)
 - “*Intellectual Social Responsibility and the Fight against Corruption in Kenya*” that was held at Kenyatta University, **Kenya** (15th to 16th April 2010).
 - 2nd EuCheMS Chemistry Congress. www.euchems-torino2008.it. **2008** September 16 – 20 Turin, **Italy**. **V.3 / P-047 / Emerging Perfluorinated Chemicals Surfactants Substitutes Degradation Studies (presented)**.
 - Excellence Center for Development Cooperation (EXCEED), DAAD, UNESCO: Sustainable Water Management in African Countries. Presentation on “*Halogenated chemicals of emerging concern in water: A report on Perfluoroalkyl acids (PFAAs) in Lake Victoria Gulf water and rivers*” Maseno University-Kisumu, Kenya, 1st – 3rd Oct. 2012 (**Presented**).
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- Nordfluor/NECC2012. Nordic Environmental Chemistry Conference. “*Biotransfer factors and tissue distribution of perfluoroalkyl acids in dairy cows receiving a naturally contaminated diet*”. 4th-8th June, 2012. Harjattula, **Finland**.
 - Alexander Von Humboldt International Kollege. “Synergy And Networking To Enhance Research And Development”. 23 to 26th Nov. 2010. Nairobi, Kenya (**Organized and Presented**)
 - “*Intellectual Social Responsibility and the Fight against Corruption in Kenya*” that was held at Kenyatta University, **Kenya** (15th to 16th April 2010).
 - 2nd EuCheMS Chemistry Congress. www.euchems-torino2008.it. **2008** September 16 – 20 Turin, **Italy**. **V.3 / P-047 / Emerging Perfluorinated Chemicals Surfactants Substitutes Degradation Studies (presented)**.
 - 1st international Workshop / Fluorinated Surfactants: New Developments, Idstein, **Germany**. June **2008**. Title: (**PB 05**). *Emerging perfluorinated chemical surfactant substitutes degradation studies*. (**PB 06**). *Gas chromatography as an alternative analytical methodology for fluorinated alkyl surfactants in biotic and abiotic matrices*. (**Presented**).
 - Wasser 2008: a Conference organised by Water Chemical Society, Germany at Trier, **Germany**. April 2008. Title: (**PAn05**). *Gas Chromatography as an Alternative Analytical Methodology for Fluorinated alkyl acid Surfactants in Biotic and Abiotic Matrices*. April **2008 (presented)**.
 - International Conference on Water and Developments in Kunming University of Agriculture, **China**. Sept. 2007. Title: *Analysis of PFOS and PFOA in Water and Fish from Lake Victoria and study of New Perfluorinated surfactants substitutes*. Oral presentation. September **2007(presented)**.
 - Sustainable use of Natural recourses: organised by UNEP and Tongji University in Shanghai **China**. *Properties and fate of PFCs in the Environment*. Oral presentation. August **2007(presented)**.
 - Wasser 2007: a Conference organised by Water Chemical Society, Germany at **Passau, Germany**. (May 2007).

RECENT PUBLICATIONS

Papers

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- Reva ON, Sifuna A, **Orata F**, Omolo C, Iramiot JS, Enright MC, Mutshembele A, Zhou J, Shivoga WA. From Lake Victoria to the Tap: Antibiotic Resistance and Pathogenic Contamination of Kisumu City Water Supply and Wastewater Network. *Trop Med Int Health*. 2026 Feb 16. doi: 10.1111/tmi.70105. Epub ahead of print. PMID: 41697036.
 - Kikuvi, J., Mutua, G., Gembo, R.O. **Orata F**. Kinetic, isothermal and thermodynamic study on the adsorptive removal of chloramphenicol from water by iron-impregnated Kenyan clinoptilolite zeolite. *Reac Kinet Mech Cat* (2025). <https://doi.org/10.1007/s11144-025-02876-2>
 - Fred Sifuna Wanyonyi, **Francis Orata**, Ponnadurai Ramasami, Emily Ngeno, Victor Shikuku, Robert O. Gembo, Gershom Kyalo Mutua & Anthony Pember (2024). Unlocking the adsorptive effectiveness of naturally occurring heulandite zeolite for the removal of PO₄³⁻ and NO₃⁻ anions from wastewater. *Environmental Monitoring and Assessment*. Published: 20 December 2024, Volume 197, article number 78, (2025)
 - Emily Ngeno, Roselyn Ongulu, Victor Shikuku, Deo Ssentongo, Benton Otieno, Patrick Ssebugere, **Francis Orata**, (2024) Response surface methodology directed modeling of the biosorption of progesterone onto acid activated Moringa oleifera seed biomass: Parameters and mechanisms, *Chemosphere*, Volume 360, 2024, 142457, ISSN 0045-6535, <https://doi.org/10.1016/j.chemosphere.2024.142457>.
 - Fred S. Wanyonyia, **Francis Orata**, Gershom K. Mutua, Michael O. Odey, Sizwe Zamisa, Sopuruchukwu E. Ogbodo, Francis Maingi, Anthony Pembere (2024). Application of South African heulandite (HEU) zeolite for the adsorption and removal of Pb²⁺ and Cd²⁺ ions from aqueous water solution: Experimental and computational study. *Heliyon*, Volume 10, Issue 14, e34657. [https://www.cell.com/heliyon/fulltext/S2405-8440\(24\)10688-3](https://www.cell.com/heliyon/fulltext/S2405-8440(24)10688-3)
 - Emily Ngeno, Roselyn Ongulu, **Francis Orata**, Henry Matovu, Victor Shikuku, Richard Onchiri, Abel Mayaka, Eunice Majanga, Zachary Getenga, Joel Gichumbi, Patrick Ssebugere (2023). Endocrine disrupting chemicals in wastewater treatment plants in Kenya, East Africa: Concentrations, removal efficiency, mass loading rates and ecological impacts. *Environmental Research*. Volume 237, Part 2, 15 November 2023, 117076
 - Awandu, SS., Ochieng Ochieng A., Onyango B, Magwanga, RO., Were P, Atieno., Ochung' A.,**Francis Orata**., et al. (2022) High seroprevalence of Immunoglobulin G (IgG) and IgM antibodies to SARS-CoV-2 in asymptomatic and symptomatic individuals amidst vaccination roll-out in western Kenya. *PLoS ONE* 17(12): e0272751. <https://doi.org/10.1371/journal.pone.0272751>.
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- Chirikona, F., Quinete, N., Gonzalez, J., Mutua, G., Kimosop, S., & Orata, F. (2022). Occurrence and distribution of per-and polyfluoroalkyl substances from multi-industry sources to water, sediments and plants along Nairobi River basin, Kenya. *International journal of environmental research and public health*, 19(15), 8980.
 - Jemutai-Kimosop, S., Okello, V. A., Shikuku, V. O., Orata, F., & Getenga, Z. M. (2022). Synthesis of mesoporous akaganeite functionalized maize cob biochar for adsorptive abatement of carbamazepine: Kinetics, isotherms, and thermodynamics. *Cleaner Materials*, 5, 100104.
 - Wanyonyi, F. S., Fidelis, T. T., Louis, H., Mutua, G. K., Orata, F., Rhyman, L., & Pembere, A. M. (2022). Simulation guided prediction of zeolites for the sorption of selected anions from water: Machine learning predictors for enhanced loading. *Journal of Molecular Liquids*, 355, 118913.
 - Wikarski, D., Aurah, C., Ebinga Osore, E., Mengich, G., Mutua, G., Ndiema, A., Orata, F... & Weber, C. T. (2021). Towards Practice-Oriented Higher Education for Sustainable Rural Development in Western Kenya.
 - Onchiri, R., Mayaka, A., Majanga, A., Ongulu, R., Orata, F., Getenga, Z. M., & Gichumbi, J. M., Ogora E.N.(2021) Phthalate Levels in Wastewater Treatment Plants of Lake Victoria Basin. *Applied Ecology and Environmental Sciences*. 2021, 9(12), 1011-1017. DOI: 10.12691/aees-9-12-4. Received November 05, 2021; Revised December 08, 2021; Accepted December 16, 2021
 - Wanyonyi, F. S., Fidelis, T. T., Mutua, G. K., **Orata, F.**, & Pembere, A. M. (2021). Role of pore chemistry and topology in the heavy metal sorption by zeolites: From molecular simulation to machine learning. *Computational Materials Science*, 195, 110519.
 - Wanyonyi, F. S., Pembere, A., Mutua, G. K., **Orata, F.**, & Louis, H. (2020). Computational screening of zeolites for the adsorption of selected pharmaceutical pollutants. *SN Applied Sciences*, 2(11), 1-9.
 - Jemutai-Kimosop, S., **Orata, F.**, Shikuku, V. O., Okello, V. A., & Getenga, Z. M. (2020). Insights on adsorption of carbamazepine onto iron oxide modified diatomaceous earth: kinetics, isotherms, thermodynamics, and mechanisms. *Environmental research*, 180, 108898.
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 - Selly Jemutai-Kimosop, **Francis Orata**, Zachary Getenga. *The Influence of Filter Mud Compost and Tithonia diversifolia Leaves on the Dissipation of Diuron in Soils within the Nzoia River Drainage Basin, Kenya*. Bull Environ Contam Toxicol. Volume 89, Issue 2 (2012), Page 328-333.
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Books

- Orata, F. (2017). Sewage and Wastewater Treatment Plant Performance: Challenges and Lusambilid the Environmental Impact. *Advances in Environmental Research*, 137. Justin A. Daniels. Nova Science Publishers, New York, Vol 58: 137 – 157. ISBN: 978-1-53612-622-8; Issn: 2158-5717.
- Omoto, F. Orata. (2018). Conventional Wastewater Treatment Plants as a Discharge and Source Point for Biota Exposure to Micro-pollutants. In *Ecotoxicology* (pp. 213-239). CRC Press. ISBN 9781315296364, Chapter 11.
- ISBN 978-3-8322-8352-0; **Book, 2009. "Perfluorinated compounds in environmental Matrices of Lake Victoria gulf"**. Shaker.de publishers.
- Orata, F. (2012). Derivatization reactions and reagents for gas chromatography analysis. *Advanced gas chromatography-Progress in agricultural, biomedical and industrial applications*, 91. ISBN 978-953-51-0298-4, Chapter 5: 83-108.
- Orata, F. (2020). Chemicals of emerging concern in surface and wastewater: a perspective of their fate within the Lake Victoria catchment area of Kenya. In *Effects of Emerging Chemical Contaminants on Water Resources and Environmental Health* (pp. 1-16). IGI Global. ISBN13: 9781799818717; doi:10.4018/978-1-7998-1871-7.ch001.

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- ISBN: 978-1-53617-466-3; Chapter 3. *Environmental Toxicity of Diclofenac*, in **Environmental Pharmacology of Diclofenac**. (Francis Orata, PhD, Department of Pure and Applied Chemistry, Masinde Muliro University of Science and Technology, Kakamega, Kenya).
 - Francis **Orata** and Fred Sifuna (2023). *Uptake, Bioaccumulation, Partitioning of Lead (Pb) and Cadmium (Cd) in Aquatic Organisms in Contaminated Environments*. In Rachel Ann Hauser-Davis, Natalia Soares Quinete, Leila Soledade Lemos, *Lead, Mercury and Cadmium in the Aquatic Environment*. Worldwide Occurrence, Fate and Toxicity. CRC Press. Taylor & Francis. Chapter 8. pp 165.

INNOVATIONS

- **16th-18th October 2024**. Certificate of Achievement. For the innovation “*SP-Amend*”. Position on in Agriculture and Environment Innovations. 6th Annual Innovation Week and Public Lecture held at the University of Eldoret, Kenya.
- Francis Orata & Gershom Mutua. Manufacture of *Ceramic Nanomaterial Filtered Water Purifier Prototype*. Presentation at Technical University Brandenburg, Germany. **September 2021**.

Journals

Editor in Chief: Prof. Orata is the Chief Editor: Journal of Advances in Science, Engineering and Technology (JAdSET). University-based Journal of Masinde Muliro University of Science and Technology.

Editorial board: Journal of Waste Water Management & Analysis.

Reviewer: Analytical and Bioanalytical Chemistry, Chemosphere, Science of Total Environment, among others.

FUNDED RESEARCH PROJECTS

1. East Africa AMR-STOP and project Id: NIHR163838. As co-PI. 3 Million British Pounds (3M£). ‘Africa AMR-STOP: Strategies for Tackling, Optimizing, and Preventing Environmental Antimicrobial Resistance in East and Southern Africa’.
2. Resilience-Building for Education and Climate Learning, Adaptation, and Innovation in Mitigation. Acronym: RECLAIM. Dr. *Umulkher Ali Abdillahi* – Lead Coordinator. Prof. *Francis Orata Omoto* – Scientific Lead. Call: NDICI-2024-MOBAF, (EU, Intra-Africa Academic Mobility Scheme), Project number: 101234594.
3. RSC Researcher Collaborations Grant (C23-0810844789). Awarded £4848 for your project Synthesis and Application of Titanium Dioxide-based Flocculant Nanocomposite towards Degradation of Diazinon as a Model Pollutant from Wastewater Treatment.
4. Fighting AMR through Monitoring and Innovative Green Eco-Hydro Wastewater Treatment among Vulnerable Communities in Kisumu City, Kenya. £ 30000.
5. Towards COVID-19 Containment: Serological, Fecal and Wastewater Epidemiological Surveillance of SARS-CoV-2 in Support of Home-Based Isolation and Care in Kenya. Grant. NRF (Pretoria, South Africa, ZA). COV19200616532700. 20000000 KES.
6. Uk-Africa Network to Strengthen Environmental Initiatives to monitor and Control Antimicrobial Resistance (AMR) Spread in Lake Victoria Basin. Grant. Academy of Medical Sciences (London, GB). GCRFNGB\1143.
7. Royal Society of Chemistry Inclusion and Diversity Fund (“RSC”). £4885. May 2021. No. 173957878. Promoting Chemical Sciences in Rural Based schools.
8. Royal Society of Chemistry Inclusion and Diversity Fund (“RSC”). £4976. May 2020. No. 137914217. Motivational Activities towards Chemical Sciences.
9. Grant for your Multidisciplinary project by the NRF Kenya. KES 9,000,000 (Nine Million Kenya shillings) “Use of locally available plant resources for phytoremediation of potable contaminated water by endocrine disrupting chemicals”.
10. ProUniEdu-WeK, a DAAD funded project Between MMUST and Technical University of Brandenburg. Ongoing since 2017.
11. Dietary exposure to perfluorinated carboxylates (PFCAs) and perfluorinated sulfonates (PFSA). In Collaboration with the Department of Applied Environmental Science (ITM). *Stockholm University, Sweden*. EU, PEEFOOD Project.

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12. Inventorying. Kenya national Implementation Plan (NIP) for the Stockholm convention on Industrial Persistent Organic Pollutants (POPs). World Bank and Government Ministry of Environ, Water and natural Resources. World Bank, through the Ministry of Environment **1.5 million**.
 13. Field dissipation of Carbofuran and Diuron in Kenyan Tropical Soils and the influence of organic amendments MMUST.
 14. Isolation and Characterization of Carbofuran degrading Bacteria: A case Study of Nzoia River Basin. Funded by National Council of Science and Technology, Kenya. NACOSTE.
 15. NRF 2019 2020 **850000**KSH Agripina Khalembi Dr. Francis Orata Omoto
 16. IFS – Phytoremediation and adsorption of pharmaceuticals from waste water. **12000 \$** Ms. Sally Kimosop, Dr. Francis Orata
 17. CEWARM – River catchment research. MMUST Fund. KES **1500000**. Prof. William Shivoga, Dr. Francis Orata Omoto
 18. River Isiukhu research (URF) Jane Oremo Dr. Francis Orata Omoto, Joseph Owino
 19. Farms contamination (URF) Agripina Khalembi Dr. Francis Orata Omoto.

STUDENTS SUPPERVISSION

Postgraduate students (PhD)

- Selly Jemutai Kimosop. (Reg. No. SCH/H01/13). **(PHD)**. Phytoremediation and Sorption Kinetics of selected Pharmaceuticals using Iron-doped Adsorbents, and their Discharge Loads within Lake Victoria basin, Kenya. Department of Pure and Applied Chemistry. Masinde Muliro University of Science and technology. **Complete**.
- Ogara Rose Shieunda CDP/H/04/012 Accumulation of heavy metals (Cr and Cd) and their spatial and health risk assessment in river Sosiani, Kenya. Temporal distribution in water, sediment and 3 species of fish, emphasizing on public. **PHD. Complete**
- Agripina Muranditsi Khalembi, (Sch/H/02/2016). Bioaccumulation and Biotransfer of Selected Pesticides and Veterinary Drugs in Dairy Cattle in a Naturally Contaminated Environment, their Prevention Using Haccp. **PHD. On going**
- Emily C. Ngeno. (SCH/H/01-56335/2017). Use of Locally Available Plant Resources for Biosorption and Phytoremediation of Wastewater Contaminated by Endocrine Disrupting Chemicals. **Complete**
- Fred Wanyonyi Computational screening of zeolites for the adsorption of selected pharmaceutical pollutants. **On going**

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- Agripina M. Shitandayi. SCH/H/01-54508/2020 (PHD). Potential of Zero Valent Fe/Al in Degradation of Azaarenes and Nitro-Polycyclic Aromatic Compounds and Their Distribution in Nzoia and Isiukhu Rivers Basin. **Ongoing.**

Postgraduate students (MSC)

- Jack Kikuvi. SCH/G/01-70042/2022. Removal of selected halogenated pharmaceuticals from water by adsorption onto iron-modified Kenyan Natural Zeolite. **Complete**
- Ngeno Emily (Reg. No. SCH/G/07/12). Isothermal, Kinetic and Thermodynamic Studies of Adsorption of Caffeine and Ciprofloxacin onto Pyrolytically Derived Water Hyacinth Biochar. **Complete**
- Sifuna W Fred (Reg. No. SCH/G/02/13). Levels of selected pharmaceuticals in wastewater treatment plants within Lake Victoria region of Kenya, and their electrochemical degradation. **Complete.**
- Florah Chirikona (Reg. No. SCH/G/02/11). (MSc). Determination of Perfluoroalkyl acids (PFAAs) in waste water treatment plants (WWTPs). Degree of Master of Science. Department of Pure and Applied Chemistry. Masinde Muliro University of Science and technology. **Complete.**
- Selly Jemutai Kimosop. (Reg. No. SCH/G/01/09). Selected Carbamate and Organophosphorous Pesticides Occurance and Fate in Environmental Matrices of Nzoia River Basin. **Complete.**
- Pauline Adisa, REG NO: SEB/G/03/15 Assessment of levels and forms of mercury in soils, sediments and Vegetation material in Muhudu-kaimosi, Vihiga County, Kenya.
- Faith Birgen SCH/G/06/15. Multi pollutant removal by impregnated al-fe oxide clay water Hyacinth biochar composite via adsorption.
- Joyce Kipchumba, SCH/G/05/2014. Kinetics Models for Degradation of, Chlorpyrifos and Diuron at Different Substrate Concentrations.
- Julias Thuku Kamau, (SCH/G/07/14). The Application Amount of Filter Mud for the Best Fit Kinetic Model on Degradation of Diuron and Chlorpyrifos.
- Shitandayi Agripina Mukhabali, (SCH/G/08/14). Source and Distribution of Polycyclic Aromatic Hydrocarbons in the Sugarcane Growing Regions of Nzoia River Catchment, Kenya. **Complete.**

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- Jane Oremo, SCH/G/01-57596/2016. Assessment of Heavy Metals, Nutrients in Water and Benthic Macroinvertebrates; Their Partitioning and Sorption Characteristics along Isiukhu River. **Complete**
 - Jack Kikuvi (Reg NO: SCH/G/01-70042/2022) Removal of Selected Halogenated Pharmaceutical from Water by Adsorption onto Iron-Modified Kenyan Clinoptilolite. **Complete**
 - Caroline Mukenye. To work on the application of Natural and Fe-doped zeolite as adsorbents for the removal of ionic and halogenated pollutants.
 - Manoah Oponga. Is to start work on Endocrine Disrupting Compounds in dumpsite waste leachates.
 - Mabuko Josephat Reg. No. SCH/G/01-53946/2019. Removal of selected halogenated pesticides from water by adsorption onto physically treated zeolite.

Undergraduates

> (more than) 50

THESIS EXAMINATION.

- Determination of Aflatoxin Strains and Nutritive Levels Associated with *Rastrineobola Argentea* in Selected Localities in Kenya. Mr. Aloo Lawrence Odhiambo's I56/74268/2014 MSc thesis. University of Nairobi, Chemistry Department. **October 2021**
- Analysis of Pesticides Residues in Tomatoes and French Beans in Murang'a and Kiambu Counties, Kenya. Student: Evans Kipkemoi-AS401/5023/2018. University: Murang'a University of technology. **September 2021.**
- Trans-Esterification of Fatty Acids for Production of Biodiesel under Magnetic-Impulse High-Frequency Cavitation Processing on Activated Carbon and Hydrotalcite Support: By Student Number: 201185324, Mr. Ajay Bissessur. University of Johannesburg. PhD Thesis. **February, 2020**
- Determination of Metribuzine and Chloropyrifos in Organically Amended Soils and with Application History within Nzoia River Drainage Basin, by Me. Gershom Kyalo Mutua, **July 2013.** Masinde Muliro University of Science and Technology. MSc Thesis.

LANGUAGES

English: language of instruction and mother tongue

Germany: Basic communication; Language course from November 2005 to April 2006

Kiswahili: National language

HONORS AND AWARDS:

- The MMUST Vice Chancellor's recommendation 2015
- 4th Best researcher, MMUST 2015
- Best PHD thesis, Mainz University 2009.
- Deutscher Akademischer Austausch Dienst e.V (DAAD) Scholarship 2005.
- University of Nairobi Scholarship Award, 2001 – 2003
- Certificate of Service to University of Nairobi Award, 1998.
- Certificate of Service to NUCC, 1998 (Public Relations Officer)
- Certificate of Merit from WCK, KGGA, YWCA, NCKK, and KAYO, 1994
- Honored by inclusion in the WHO is WHO (world book of fame) in Science and Engineering, July 2009.

PROFESSIONAL AFFILIATIONS

- The Eastern Africa Research and Innovation Management Association (EARIMA)
- Royal Society of Chemistry Membership (RSC), MRSC Member
- Kenya Chemical Society.
- American Chemical Society
- Gesellschaft Deutscher Chemiker
- DAAD Alumni
- The Society of Environmental Toxicology and Chemistry (SETAC)
- ANCAP (Africa Network of Chemical Analysis of Pesticides)
- International Panel on Chemical Pollution, IPCP
- AIHA: International Affairs Subcommittee for Africa.

Services to the University (MMUST)

- Director, Research and Postgraduate Support.
- Board member, CIT.
- Board Member, STIL,
- Board member, Disability mainstreaming unit. Member of Senate subcommittees.

Service to Community

- 2025 to date: Chairperson, Board of Management, Mumias East Technical and Vocational Training Collage
- 2020-2026: Director, Board Kakamega County Rural Water and sanitation Company (KACRWASCO)
- 2020 2025: Synod Member, ACK, Mumias Diocese
- 2022 to dates: Committee member KEBs
- 2024 to date: consultant/advisor, Industrial chemicals.
- 2015 – 2025: Broad of Management and Chairman of secondary schools (Imakale, Namamba, Mukweya, Sidikho, Namudere).
- 1998 to dates: Board member and founder of Harambee Netherlands/Kenya, an NGO that gives scholarship to the needy.
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Non-Academic Projects

1. Inventory of solid waste management in Nairobi and Central Kenya. Co-operation with National Environmental Management Authority (NEMA) and Waste management company LACOTE (2003 - 2004). Capacity: Researcher.
2. TRUST project: Twinning contrasting basins with common issues: Nzoia River in Kenya and the Middle Catchment of the Rhine River in Germany (Hessisches Ried). An Nzoia River Basin Management Initiative (2006 - 2007). Capacity: Co-ordinator.

REFEREES

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