

Dr. Justin K. Maghanga, PhD
Environmental Analytical Chemist
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I am a trained Environmental Analytical Chemist with over fifteen years' experience in the areas involving chemical instrumentation, environmental electrochemistry, water quality, wastewater treatment technologies, air pollution monitoring and soil chemistry. I am also a registered Environmental Management Consultant, Licenced by NEMA as a Lead Expert in SEE, EIA &EA.

Personal Profile

Nationality: Kenyan
Date of Birth: 1971
Marital Status: Married

Education

2014: PhD. in Analytical Chemistry, University of Eldoret.

Thesis Title: Electrochemical Treatment of Textile Dye Waste Water by Anodic Oxidation.

2008: MPhil. Analytical Chemistry, Moi University.

Thesis Title: Improvement of tea effluent clarification by electrocoagulation: A case study of Chemomi tea factory, Nandi South District, Kenya.

1995: B.Sc. Chemistry Hons., Moi University

Project Title: Determination of nitrogen and phosphorous levels in Muhoroni sugar plantation soils and their residual effects.

1989: KCSE, O-Level, Kenyatta High School, Mean Grade B-

1985: KCPE, Primary, St. Joseph's Primary School, 58 points

Professional Experience

September 2017-Date: Taita Taveta University, Department of Mathematics, Statistics and Physical Sciences

Position: Senior Lecturer in Analytical Environmental Chemistry

Responsibilities:

Lecturer in Analytical & Environmental Chemistry

Supervision for Masters and PhD students

Thematic Leader in Chemistry Programmes at TTU

2017 - Date: Taita Taveta University

Position: Dean, School of Science and Informatics

Achievements:

- a) I represent the School in different University Committees such as Deans Committee, the Senate, CEMEREM Management Committee, Research Committee, Training Committee, Strategic planning

Committee and the Graduation Committee. I have also served in a number of *ad-hoc* Committees including:-

- i). Education programmes Development Committee (Chair)
 - ii). Centres of Excellence in Africa Meeting (2017) Planning Committee (Chair)
 - iii). Restricted Tender evaluation (2017) Committee, EIA (Chair)
 - iv). Cost-cutting (2017) Committee
 - v). First International Conference on Mining and Mining Education in Africa (2017) Planning Committee
 - vi). TAITAGIS Kick-Off Conference meeting (2018) Committee (Chair)
- b) I spearheaded the drafting of ISO Procedures for Academic Division and University Policies such as Examination and Certification Policy.
- c) I led the School in the development of ten (10) new programmes (Five Graduate and five Undergraduate) that were approved by the Senate and accredited by CUE in 2017. The programmes were launched in 2018/2019 AY

2015- 2016: Taita Taveta University

Position: Lecturer in Chemistry, School of Science and Informatics

Responsibilities:

- Lecturer in Analytical and Environmental Chemistry.
- Chairman, TTU Strategic Committee
- Registered Environmental Management Consultant (Lead Expert EIA/EA)

Courses Taught

Inorganic Chemistry, Basic Organic Chemistry, Soil Science, Soil Chemistry, Plant Nutrition, Soil Fertility and Fertilizers

2014: Pwani University, Kilifi

Position: Lecturer, School of Pure and Applied Sciences

2012- 2013: Pwani University College, Kilifi

Position: Assistant Lecturer, School of Pure and Applied Sciences

- Assistant Lecturer in Analytical and Environmental Chemistry.
- Registered Environmental Management Consultant (Lead Expert EIA/EA)

Courses taught:

Postgraduate: Environmental Chemistry, Atomic and Molecular Spectroscopy, Advanced Electroanalytical, Chemiluminescence and Thermal Methods

Undergraduate: Instrumental Methods, Introduction to Analytical Instrumentation, Theory of Spectroscopic methods, Electrochemistry, Environmental Chemistry, Organic Spectroscopy, Introduction to Physical chemistry, Fundamentals of Inorganic Chemistry, Surface and Colloid Chemistry, Phase Equilibria, Soil Fertility and Plant Nutrition, Municipal Solid Waste Management, Introduction to Soil Science, Environmental Soil Management.

Other responsibilities:

- Departmental Examinations and Timetable Coordinator
- Departmental Coordinator, Institutional Based programmes
- Departmental and School Laboratory Equipment Committee member

- Member of Departmental Curriculum Development Committee
- Member of Departmental Staff Development Committee
- Supervision of undergraduate and postgraduate Senior Projects
- Acting Chair, Department of Chemistry and Biochemistry

MSc. Student's Thesis Supervision

a) Graduated

1. Ms Agnes Samba: Assessment of Vetiver grass in phytoremediation of wastewater: A case study of Kipevu Wastewater Treatment Plant, Mombasa, Kenya: MSc Environmental Science (KCDP Research Grant, 1.7M) : **2017**
2. Clarice Amani- Nutrients analysis in marine water and sediment on sea grass meadows of Malindi: MSc Environmental Science (KCDP Research Grant, 1.7M). **2017**
3. Said Salim- Investigating the quality of water in shallow wells at Mokowe village, Pokomo, Kenya: MSc Environmental Science (KCDP Research Grant, 1.7M). **2017**

b) Ongoing

1. Mr. Martin Osemba: Electrochemical treatment of Azo dye wastewater using BDD and Silver Nanoparticles- MSc Chemistry (Pwani University Annual Research Grant). **2014-Date**
2. Mr. Michael Mwashighadi: Electrochemical treatment of Azo dye wastewater using Stainless Steel and Aluminium Electrodes- MSc Chemistry, Kenyatta University. **2015-Date**
3. Onunga Gordon: Determination of the Microplastics Concentration Levels in Beaches and Sea Bed Sediments and their association with heavy metals In Indian Ocean along the Kenyan Coastline, MSc Chemistry , **2015-Date**
4. Mr. Mnjala: Use of Maerua Subcordata in removal of water turbidity in semi-arid areas: MSc Environmental Sciences, Pwani University, **2015-Date**

PhD. Student's Thesis Supervision

Ongoing

1. Kosore Charles: Occurrence and ingestion of microplastics by zooplanktons in Kenya's Marine Environment, PhD Chemistry, Pwani University. **2016-Date**
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2006 – 2011: Moi University Eldoret

Position: Part – time Lecturer, Moi University

Snr. Technologist and Head, Commercial Water and Soil Testing Laboratory

Duties:

Heading Chepkoilel Commercial Soil Testing Laboratories, Calibration of instrumental methods, carrying out soil, plant and water sampling, conducting field baseline surveys, soil surveys and writing soil fertility, water and fertilizer recommendation reports.

Undergraduate Courses taught:

Methods of Chemical Analysis, Surface and Colloid Chemistry, Basic Chemistry, Soil Chemistry, Soil and Water Pollution Management, Soil Testing and Fertilizer Use, Food and Nutrient Analysis, Soil Science.

1999 – 2005: Eastern Produce Kenya Ltd. (UK London –based Multinational Tea Company)

Position: Group Chemist

Responsibilities:

- Heading a UK-based multinational Group Analytical Chemistry Laboratory at Nandi Hills Operations, Kenya.
- Carrying out soil, plant and fertilizer chemical analysis for fertilizer recommendations and conformity respectively.
- Monitoring effects of aerial fertilizer application to surface waters by carrying out analysis in rivers within EPK in conjunction with the Government of Kenya.
- Monitoring drinking water quality in piped water, new supplies, existing springs and dams and obtaining certification from KEBS through microbiological and chemical water analysis.
- Quality control of black tea manufacture through monitoring of total polyphenols, theaflavins, thearubigins, colour index, depth and brightness;
- Factory process control: Advice on process parameters in the tea processing.
- Carrying out catechin and oxidation profiles for tea cultivars to maximise black tea quality processing for export teas.
- Carrying out MRLs in tea for quality assurance of export teas: heavy metals, PAHs and pesticide residues in tea.

1996 -1999: Teachers Service Commission of Kenya

Position: UT. Graduate Teacher

Responsibilities:

- H. O.D sciences, class teacher and Chemistry teacher forms 1-4.
- District judge chemistry exhibits and Patron science congress.
- Patron hockey and YCS clubs.

1995 -1996: Steel Makers Limited, Mazeras Plant, Mombasa

Position: Production Assistant/Refractory Chemist

Responsibilities:

- Heading the Refractory Division in production of quality refractories
- Ensuring quality control of materials
- Formulation of raw materials with high alumina refractory products specific for industries such as Bamburi Portland Cement, Kenya Railways etc.,

Computer Literacy

Computer literate with experience in the following software packages:- SAS, GenStat, MS-Excel, MS-Power Point, MS-Word and Chemdraw®.

Grants Won

- 1) **2017-2020:** Assessment of select Rice Varieties for Smallholder Farming Systems in the Wetlands and Highlands of Taita-Taveta County. NRF Research Grant 19M. *Dr. Marianne Maghenda, Dr. Anne Kambura, Dr. Justin Maghanga (Environmental Chemist), Dr. Mwamburi Mcharo, Dr. Maurice Ogada, Mrs Emma Mwafaida Ogada, Dr. John Kimani, Dr. Beatrice Salasya.*
- 2) **2016 -2018:** Joint Kenya -South Africa, NRF, KES 3,000,000 and SA Rand 400,000. *Monitoring Emissions of PAHs from Renewable and Non-Renewable Fuel Combustion in Urban and Rural Kenya.* Dr.

Aloys Osano, Maasai Mara University PI Kenya, MMU and **Dr. Justin Maghanga Co-PI Kenya, Taita Taveta University.**

- 3) **2016:** Baseline Soil Nutrient Survey in Acid Soils of Taita Taveta County. Taita Taveta University Research Grant KES 400,000. **Dr. Justin Maghanga, Dr. Ann Kambura & Mr. Koti Matata.**
 - 4) **2014:** Electrochemical treatment of azo dye wastewater using BDD and Silver nanoparticles. Pwani University Research Grant, Kshs. 500,000. **Dr. Justin K. Maghanga, Dr. Loice Ojwang and Martin Osemba (MSc. Chem student).**
 - 5) **2011:** Ph.D. Analytical/Environmental Chemistry. PhD Research Grant, KES 1.2M (National Commission of Science, Technology and Innovation, NACOSTI, Kenya): Electrochemical treatment of dye wastewater by anodic oxidation. **Mr. Justin Maghanga, Prof. Fred Segor, Prof. Justin Irina, Prof. Mwakio Tole.**
 - 6) **2010:** Moi University Research Grant, KES 200,000. Comparison of Steel and Aluminium electrodes in decolourization of tea wastewater; case study of Kepchomo tea factory, Nandi Hills. **Prof. Fred K. Segor, Mr. Justin Maghanga and Harun Baron (MSc Student).**
 - 7) **2010:** Moi University Research Grant, KES 150,000. Biosorption of textile dyes using agricultural by products as sorbent materials, Case study of RIVATEX Factory wastewater Eldoret. **Mr. Justin Maghanga, Prof. Justin Irina, Prof. Fred Segor.**
 - 8) **2008:** MPhil. Chemistry Moi University Research Grant, KES 112,000 (University Annual Research Grant, Moi University): Improvement of tea wastewater clarification by electrocoagulation; Case study of Chemomi tea factory, Nandi South District. **Justin Maghanga, Prof. Fred Segor, Prof. Lazare Etiegni.**
 - 9) **2008:** M.Phil Chemistry, Tuition grant, Moi University, KES 90,000.
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Professional Membership

- The Kenyan Chemical Society (KCS) - Treasurer, Coast Chapter.
 - Environmental Institute of Kenya (EIK)
 - NEMA Lead Expert EIA/EA
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Technical Reports and Consultancy

- 1) **April 2019:** Environmental Impact Assessment (EIA) Report for the construction of Taveta Social Hall and Market Sheds by the Taita Taveta County Government, Kenya.
- 2) **Dec 2018:** Strategic Environmental Assessment (EIA) for Diaspora University Town in Voi, Taita Taveta County
- 3) **June 2017:** Environmental Impact Assessment (EIA) Report for the construction of Voi Catholic Church, Taita Taveta County, Kenya.
- 4) **November 2016:** Report on "A Public Inquiry on Impacts of Mining on Human Rights Violation in Taita Taveta County, Kenya". Worked as a Consultant Environmental Chemist and Deputy Project Coordinator for Kenya National Commission for Human Rights (KNCHR) in Kenya.
- 5) **October 2016:** Environmental Impact Assessment (EIA) Report for a Residential Storey Building , Mnarani, Kilifi, Kenya
- 6) **October 2016:** Environmental Impact Assessment (EIA) Report for a Residential Storey Building , Voi, Kenya
- 7) **April 2014:** Environmental Impact Assessment (EIA) Report for a Residential Storey Building, Kisumu Ndogo, Kilifi, Kenya
- 8) **October 2013 – March 2014:** Environmental Impact Assessment Report for GreenHeat Company (USA-Based) in Kipevu, Waste Water Treatment Mombasa Kenya.
- 9) **September – December 2011:** Consultant for Nandi Tea Estates, Kenya. Technical Report on "Fertilizer Recommendations based on Soil and Leaf Chemical Analysis: Nandi Tea Estates, Nandi Hills Kenya".

- 10) **September 2004:** Conducted a one day Training on Water Treatment and Quality in Eastern Produce Kenya Ltd, Nandi Hills.
 - 11) **Feb – March 2010:** Soil sampling and Analysis Training: Conducted training for one month at KARI Kakamega for Scientists and Technicians.
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Refereed Publications

Books and Thesis

- 1) **Justin K. Maghanga**, Electrochemical Treatment of Textile Dye Waste Water by Anodic Oxidation, (2014). PhD Thesis, University of Eldoret.
- 2) **Justin K. Maghanga & Fred K. Segor**. Treatment of Tea Wastewater by Electrocoagulation, (2013). Lambert Academic Publishing, ISBN: 978-3-659-48323-3.
- 3) **Justin K. Maghanga**, Improvement of Tea Effluent Clarification by Electrocoagulation: A Case Study of Chemomi Tea Factory, Nandi South District, Kenya (2008). M.Phil Thesis, Moi University

Journal Papers.

- 1) C Kosore, L Ojwang, **J Maghanga**, J Kamau, A Kimeli, J Omukoto, N Ngisiag'e, J Mwaluma, H Ong'ada, C Magori & E Ndirui (2018) Occurrence and ingestion of microplastics by zooplankton in Kenya's marine environment: first documented evidence, *African Journal of Marine Science*, 40:3, 225-234
- 2) **Maghanga J.K.**, Segor F.K., Irina J. and Tole M.P. (2017). Effect of Process Parameters on the Electro coagulation of Azo-Dye Wastewater in a Kenyan Textile Factory." *IOSR Journal of Applied Chemistry*, 10 (11): 01-07.
- 3) Swaleh M.M., Ruwa R., Wainaina M.N, Ojwang' L.M., Shikuku S. L and **Maghanga J.K.** (2016). Heavy Metals Bioaccumulation Assessment in *Acanthopleura gemmata* from Fort Jesus Mombasa. *IOSR J. Env. Sc., Tox. & Food Tech.* 10 (7):39-45, DOI: 10.9790/2402-1007013945.
- 4) Swaleh M.M.1, Ruwa, R., Wainaina M.N., Ojwang' L.1*, Samuel L.M., Shikuku L. and **Maghanga J.K.** (2016). Heavy Metals Bioaccumulation in Edible Marine Bivalve Mollusks of Tudor Creek Mombasa Kenya, *IOSR J. Env. Sc., Tox. & Food Tech* 10 (8): 43-52 DOI: 10.9790/2402-1008024352
- 5) **J. K. Maghanga**, J.L. Kituyi, P.O. Kisinyo and W.K. Ng'etich (2013). Impact of Nitrogen Fertilizer Applications On Surface Water Nitrate Levels Within A Kenyan Tea Plantation, *J. Of Chem.*, 13, <http://dx.doi.org/10.115/2013/196516>
- 6) P. O. Kisinyo, C. O. Othieno, S. O. Gudu, J. R. Okalebo, P. A. Opala, **J. K. Maghanga**, W. K. Ng'etich, J.J. Agalo, R. W. Opile, J. A. Kisinyo & B. O. Ogola (2013). Phosphorus Sorption and Lime Requirements of Maize Growing Acid Soils of Kenya, *Sust. Agric. Res.*; 2 (2):1 – 123.
- 7) **Maghanga K. Justin**, Kituyi L. John, Segor K. Fred and Kisinyo O. Peter (2012). Comparison of soil phosphorous extraction by olsen and double acid methods in acid soils of western Kenya, *East Afric. J. Pur. & App. Sc.* 2 (1): 1-5
- 8) Gichumbi, JM, **Maghanga JK**, Cheshari, EC, Ongulu, RO, Gichuki, JG (2012). Comparison of Chemical and Mineralogical Properties of Geophagic Materials from Taita and Mombasa, Kenya, *Int. J. of Scient. & Eng. Res.* 3(10):1-7
- 9) Segor, K.F, Chebii, J.F, Kituyi, L.J, Kiptoo, P, **Maghanga. J.K.** (2012). Nutrient Pollutant Loads and Their Effects on Water Quality of Perkerra River, Baringo County, Kenya. *East Afric. J. Pur. & App. Sc.* 1 (2): 74-85
- 10) P. O. Kisinyo, S. O. Gudu1, C. O. Othieno, J. R. Okalebo, P. A. Opala, **J. K. Maghanga**, J. J. Agalo, W. K. Ng'etich, J. A. Kisinyo, R. J. Osiyo, A. O. Nekesa, E. T. Makatiani, D. W. Odee and B. O. Ogola (2012). Effects of lime, phosphorus and rhizobia on *Sesbania sesban* performance in a Western Kenyan acid soil. *Afr. J. of Agric. Res.* 7 (18): 2800-2809,

- 11) Ongulu Roselyn Adhiambo, Kituyi, John Lusweti, Mitei Yulita and **Maghanga, Justin (2010)**. Fate of Fertilizers and Impact to the Ecosystem in the Chemelil Sugar zone, Kenya. *J. agric. pure appl. sci. technol.* 6: 6-10.
- 12) **Justin K. Maghanga**, Fred K. Segor, Lazare Etiégni, John Lusweti (2009). Electrocoagulation method for colour removal in tea effluent: a case study of Chemomi tea factory in rift valley, Kenya. *Bull. Chem. Soc. Ethiopia*, 23 (3):371-381.
- 13) **Maghanga Justin**, Segor Fred, Etiégni Lazare and Kituyi John (2009). Electrochemical treatment of a Kenyan tea factory wastewater. *J. agric. pure appl. sci. technol.*, 2: 68 – 75
- 14) Osano Aloys, Cheruiyot Linus, Chacha Joseph, **Maghanga Justin** and Maera John (2009). Role of Organic Nutrient Levels on the Distribution of Macroinvertebrates: A Case Study of River Sosiani, Eldoret Town, Kenya. *J. agric. pure appl. sci. technol.*, 4: 32 - 38
- 15) Ongulu Roselyn Adhiambo, Kituyi, John Lusweti, Mitei Yulita and **Maghanga, Justin (2009)**. Impact of Farming Practices on Water Quality in the Chemelil Sugar Belt. *J. agric. pure appl. sci. technol.* 3, 57-68
- 16) Kisinyo Peter, Gudu Samuel, Othieno Caleb, Okalebo John, Ochuodho Julius, Agalo Joyce, Ng'etich Wilson, Opala Peter, **Maghanga Justin**, Osiyo Richard and Ligeyo Dickson (2009). Residual effects of lime and phosphorus applications on soil and maize (*Zea mays* L.) performance in a Kenyan highland acid soil. *J. agric. pure appl. sci. technol.*, 3:1-10

Conference Proceedings

- 1) **Maghanga J.K.**, Kambura A.K., Ogada M.J., Adero N., Ndegwa A., and Maghenda M. (2017). Environmental Impacts of mining in Taita Taveta County, *1st International Conference on Mining and Mining Education in Africa, Sarova Pan Afric Hotel, 15th -16th November, 2017*.
- 2) **Maghanga Justin**, Segor Fred, Justin Irina and Mwakio Tole (2016). Electrochemical treatment of azo- dye textile wastewater: Case study of Rivatex, Eldoret, Kenya,; *East And Southern Africa Environmental/Analytical Chemistry Conference and The 11th Theoretical Chemistry Conference In Africa (ESAECC-TCCA), 15th -17th June, 2016, Reef Hotel Mombasa, Kenya*.
- 3) **Maghanga J.K.**, Segor F.K, Baron H. and Cheshari E. (2014) Electrochemical treatment of tea wastewater using sacrificial electrodes: A case study of Kepchomo tea factory wastewater. *Southern and Eastern Africa Network of Analytical Chemists (SEANAC), 09th – 13th June, 2014, Reef Hotel, Mombasa, Kenya*
- 4) Kisinyo P.O., J.J. Agallo, P.A. Opala, **J.K. Maghanga**, R.J. Osiyo, W.K. Ng'etich, J.A. Kisinyo, S.O. Gudu, C.O. Othieno and J.R. Okalebo (2010). Phosphorous sorption, effects of lime and phosphorous on soil and maize seedling growth in Kenya acid soils. *6th AIC, Moi University*.
- 5) Omenyo, V.S, P.O. Kisinyo and **J.K. Maghanga (2010)**. Effects of lime and phosphorous fertilizer on the early growth of soybean in acid soils of Uasin Gishu district, Kenya. *6th AIC, Moi University*.
- 6) **Maghanga, J. K.**, Kituyi, J.L., Segor, F.K., Kisinyo P.O., Serrem C. and Nekesa A. (2009). Extraction of soil phosphorous by Olsen bicarbonate and double acid methods in acid soils of western Kenya. *5th AIC, Moi University*.
- 7) Kituyi, J.L., Ongulu R. A., Mitei Y., **Maghanga J. K. (2009)**. Levels and Impact of Total Nitrogen and Phosphorus in the Chemelil Sugar Ecosystem. *5th AIC, Moi University*.
- 8) Kisinyo P. O., Othieno C. O., Okalebo J.R., Opala P., Osiyo R J., Kipsat M.J., Serem A.K., Ogola B. and **Maghanga J. K. (2006)**. Use of inorganic materials to replenish soil fertility in tropical Africa: Constraints and possible solutions, a review. *23rd SSSEA, 2006 Conference, Kampala*.

Workshops and Seminars

- 1) LC-MS Training , Royal Society of Chemistry, 20-24th August 2018, JKUAT Kenya
- 2) Electrochemical treatment of Textile dye wastewater using BDD Anode, *University of Pretoria, 12th April 2018*
- 3) Advanced GIS training, *TAITAGIS-Helsinki University, 20th - 24th Nov. 2017, Taita Taveta University, Voi, Kenya*.

- 4) Laboratory Quality Management Systems , ISO 17025 Laboratory Testing and Calibration Seminar: Kenya Bureau of Standards, 29th Nov. - 1st Dec. 2017, Nyali Africa Sun and Spa Beach Hotel, Mombasa, Kenya.
- 5) Maghanga Justin, Segor Fred, Justin Irina and Mwakio Tole. Plenary talk on “Application of Electrochemistry in Wastewater Treatment: Exceed Swindon workshop “Sustainable Use of Water Resources” in Kisumu, Kenya, July 4-7, 2016, Jumuia Resort Hotels Kisumu, Kenya.
- 6) Second Workshop for Kenyan-German Water and Wastewater Week, 9th- 13th October 2017, Kenya Water Institute, Nairobi, Kenya.
- 7) First workshop for Kenyan-German Water and Wastewater Week, October 2016, Kenya Water Institute, Nairobi, Kenya.

Journals Reviewer:-

- (1) IMWA
- (2) Science Alert
- (3) Annual Research and Review in Biology
- (4) International Journal of Plant & Soil Science

Referees

(1) Prof. Lusweti Kituyi, PhD

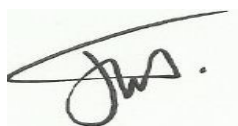
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(2) Prof. Justin Irina, PhD

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(3) Prof. Paul Guyo Mwashimba, PhD

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