

## 0. CURRICULUM VITAE OF PROF. MNB MOMBA

### 1 PERSONAL DETAILS

- 1.1 Full name: Maggy Ndombo Benteke Momba  
1.2 Title: Professor (Full Research Professor)  
1.3 Date of birth: 09 October 1958  
1.4 Place of birth: Bikoro/ Province of Equator/Democratic Republic of Congo  
1.5 Current Residence: South African  
ID No: Permanent Residence – 581009 0297 18 2  
1.6 Status: Single and Mother of 1 child  
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### 2 ACADEMIC QUALIFICATIONS

#### 2.1 Universities Attended and Period

***Doctorate degree:***

**1998 - PhD in Microbiology**, Department of Microbiology and Plant Pathology, Faculty of Biological and Agricultural Sciences, University of Pretoria.

**Expertise:** Potable Water Management

***Master Degree:***

**1995 - MSc in Microbiology** (Thesis), Department of Microbiology and Plant Pathology, Faculty of Biological and Agricultural Sciences, University of Pretoria 5).

**Expertise:** Wastewater Management.

**1985 – BSc Honors equivalent to MSc in Biology** in South Africa (course work and thesis), Research Unit-Cell Biology, Faculty of Science. University of Kisangani/Democratic Republic of Congo.

**Expertise:** Microbial ecology of fishes and its impact on the environment (river, Lake Etc...)

***Bachelor's degree***

**1983 - BSc degree in Biology**, Department of Molecular Biology, Faculty of Science, University of Kisangani - Democratic Republic of Congo (1983).

**Major Subjects:** Molecular Biology, Microbiology, Biochemistry, Genetics, and Applied Biology.

**1982 - BA degree in Education** (Applied Pedagogy - Biology-Chemistry), Pedagogic Institute of Gombe, Kinshasa- Democratic Republic of Congo.

*Major Subjects:* Mathematics, Physics, Biology, Anatomy, Botany, Chemistry, Statistics, Pedagogy and Psychology, Monograph.

## **2.2 Other Relevant Academic Qualification**

1998 - *Certificate:* Molecular Biology Techniques, at Molecular Diagnostic Company, Durban, South Africa.

1991 - *Certificate:* Management of Natural Resources and Protection of the Environment, at Clark Atlanta University, USA.

## **3 NRF RATING STATUS**

2005-current-National Research Foundation (NRF) Rated Scientist, Established Researcher (C1)

## **4 CAREER PROFILE**

### **4.1 Previous and Current Position**

1987 - 1989 Senior chief laboratories, Depot central medico-pharmaceutic Kinshasa/DC

1989 -1991 Researcher, Institut Zairois la Conservation de la Nature (IZCN), currently named Institut Congolais pour la Conservation de la Nature

1993 -1997 Researcher and Postgraduate student, Department of Microbiology and Plant Pathology, University of Pretoria

1995 -1997 Researcher, Council for Scientific and Industrial Research (CSIR)-Division of Environmental and Forestry Technology, Pretoria.

1997 - 2002 Lecturer and Researcher, Department of Biochemistry and Microbiology - University of Fort Hare, Alice, SA

2002 - 2003 Associate Professor, Department of Biochemistry and Microbiology, University of Fort Hare, Alice-SA

1/8/ 2003 – 25 March 2006 Full Professor, Department of Biochemistry and Microbiology, University of Fort Hare, Alice-SA

27 March 2006 – Current: Full Research Professor: Department of Environmental, Water and Environmental Sciences. Tshwane University of Technology, Pretoria SA.

2013-up to date: Full Research Professor and South African National Research Initiative Chair (SARChI) in Water Quality and Wastewater Management

2015 -Up to date Visiting Professor \_University de Mbandaka/ Democratic Republic of the Congo

2016 Visiting Professor - Créteil-Vitry Institute of Technology/University of Paris Est Créteil (UPEC)

### **4.2 Other Academic and Administrative Duties**

1999- Current External Examiner (BSc and Postgraduate levels)- University of Venda, South Africa

2001-Current External Examiner (Postgraduate level)- University of Pretoria, South Africa

2002 External Examiner (Undergraduate level), VISTA University, SA

2002-2015 NRF Water Research Management Niche Area Leader

2005 -Current External Examiner (Postgraduate level)- Durban University of Technology, SA

2005-Current External Examiner (Postgraduate level) - University of KwaZulu Natal, SA

- 2006 –Current External Examiner (postgraduate level) - Cape Peninsula University of Technology, SA
- 2007- Current Co-supervision of Master students, Department of Chemical Technology, University of Johannesburg
- 2015 - Current External examiner (Postgraduate level), Stellenbosch University, University of Cape Town, University of KwaZulu Natal,

#### **Leadership and management experience**

- 1998 – March 2006 Leader of the Fort Hare Water Research Group (FHWRG)
- 2002 – March 2006: Founder of a modern molecular diagnostic Laboratory that never existed at Fort Hare. This led to introduce undergraduates and Post graduate students on the novel molecular study.
- 2003- 2006 Chairperson St John HIV/AIDS Centre of Fort Beaufort
- 2002 –2006 Head and Coordinator of the Molecular Diagnostic Laboratory, University of Fort Hare
- 2003 - 2006 Leader of the Research Niche Area “The Eastern Cape Water Resources: Use and Protection for sustainable rural development”, recognized by NRF (at The University of Fort Hare).
- 2006-Current Leader of the Niche Area “Management of Water and Wastewater for The Sustainability of Water Resources and Eradication of Waterborne Diseases in South African rural communities” (Tshwane University of Technology - TUT). This Research NA has been considered as the best NA at TUT every year.
- April 2006 –2016 Leader of TUT Water Research Group
- 2013 – Current SARChI Chair Holder for Water Quality and Wastewater Management. TUT

#### **4.3 Achievements/ Awards/Recognition by peers nationally/internationally**

- 1980-1983 Pedagogic Institute of Gome/Kinshasa, Democratic Republic of Congo, Scholarship Award
- 1983-85 University of Kisangani, Kisangani-DRC, Post graduate Scholarship Award
- 1991 USAID Travelling Fellowship Award- Management of Natural Resources and Protection of the Environment, at Clark Atlanta University, USA
- 2000 Selected for listing among international biographical centre Cambridge -2000 outstanding Intellectuals of the 21<sup>st</sup> century, 1<sup>st</sup> edition
- 2000 Selected for Listing in Marquis Who’s Who Biographer Publication: Who’s Who in the World 2000.
- 2004 Winner of Outstanding Community Supporter Awards organized by the 2<sup>nd</sup> International Conference on Safe Water (November, 4-7 Johannesburg 2004)
- 2005 Winner of Woman in Water Awards under the Category -Research over 35 years old (National Award organized by the Department of Water Affairs and Forestry),
- 2005 Winner of Vice Chancellor’s Senior Researcher Medal at the University of Fort Hare
- 2005-current NRF Rated Scientist **C1**
- 1998 – 2006: Establishment of one of the largest black postgraduate programmes (BSc Honours, Master and PhD) at the historically black University (University of Fort Hare)
- 2006 – Current: Establishment of a Molecular Diagnostic Laboratory for waterborne pathogens and Master and Doctoral programmes in Water Care at Tshwane University of Technology.
- 2007 Tshwane University of Technology Certificate of Merit –First Runner-up Woman Researcher of the Year 2006
- 2008-2014 Appointed as an Editorial Board member of the Journal of *Water SA*

2009	Winner of TUT Woman of Year 2008 in Research category
2009	Winner TUT Niche Area of the Year 2008 -2010
2012 -2014	Appointment as an Editorial member of the Editorial Board of Dataset Papers in Biology.
2013	Winner of Institutional Award Vice-Chancellor 's Female Senior Researcher of the year in 2012
2013	Winner of Institutional Innovator Award of the year in 2012.
2014-Current	Adviser World Health Organisation for Household Drinking Water Treatment. Geneva.
2014	Winner of Institutional Award Vice-Chancellor's Researcher of the year 2013
2014	Winner of Woman Researcher of the year -Faculty of Science for the year 2013
2016	Recognised by the Planet Earth Institute (PEI) as one of the ten 2016 Science Heroes, the most inspirational people working in and passionate about science in Africa. PEI is a charity institution working for the scientific independence of Africa and is always keen to celebrate the amazing men and women who are making a difference in science on the continent.
2017	Winner of Institutional Award Vice-Chancellor's Researcher of the year (Female) for the year 2016
2018	Winner of Institutional Award Vice-Chancellor's Researcher of the year (Female) for the year 2017
2019	Award for Leadership Excellence by the Global Water Pathogen Project during the 20th symposium on health-related water microbiology, Vienna/Austria, 15-20 September 2019.
2021	Winner of Institutional Award Vice-Chancellor's Researcher of the Year (Female) for the year 2019/2020.
2021	Recognised by the Water Research Commission as one of the Legends of Water Research in South Africa.
2022	Winner of Institutional Award Vice-Chancellor 's Senior Researcher of the year for 2021
2022	Elected member of the Academy of Science of South Africa (ASSAF)

## 5. RACK RECORD IN POSTGRADUATE STUDENT AND POSTDOCTORAL FELLOW TRAINING

### 5.1 Student Supervision Record

No	Title	Initials	Surname	Nationality	Supervised	Degree	Graduated	University
1	Miss	T.L	Notshe	South African	1998	BSc Honours in Microbiology	1999	Fort Hare
2	Miss	BV	Mnqumevo	South African	1998	BSc Honours in microbiology	1999	Fort Hare
3	Miss	P	Kaleni	South African	1999	BSc Honours in Microbiology	2000	Fort Hare
4	Miss	S	Ndaliso	South African	1999	BSc Honours in Microbiology	2000	Fort Hare

5	Mrs	N	Dumani	South African	1999	BSc Honours in microbiology	2000	Fort Hare
6	Mr	AM	Binda	South African	1999	BSc Honours in microbiology	2000	Fort Hare
7	Miss	T	Tyali	South African	1999	BSc Honours in Microbiology	2000	Fort Hare
8	Ms	N	Makala	South African	2000	BSc Honours in Microbiology	2001	Fort Hare
9	Miss	N.	Gwija	South African	2001	BSc Honours upgraded MSc in Microbiology	2002	Fort Hare
10	Miss	VK	Malakate	South African	2002	BSc Honours in Microbiology	2003	Fort Hare
11	Mrs	Z	Tyafa	South African	2002	BSc Honours in microbiology	2003	Fort Hare
12	Miss	P	Zani	South African	2002	BSc Honours in microbiology	2003	Fort Hare
13	Mr	C	Mfenyana	South African	2002	BSc Honours in Microbiology	2003	Fort Hare
14	Miss	N.	Makala	South African	2002	MSc in Microbiology	2004	Fort Hare
15	Miss	T	Osode	Nigerian	2002	MSc in Microbiology	2006	Fort Hare
16	Mr	B	Omondi Abongo	Kenyan	2004	PhD in Microbiology	2007	Fort Hare
17	Miss	A	Okeyo	American	2004	BSc Honours in Microbiology	2005	Fort Hare
18	Mr	M	Sibewu	South African	2004	BSc Honours in Microbiology	2005	Fort Hare
19	Mr	M A	Mthanti	South African	2005	BSc Honours in Microbiology	2006	Fort Hare
20	Mr	M	Dungeni	Zimbabwean	2005	BSc Honours in Microbiology	2006	Fort Hare
21	Miss	A	Okeyo	American with South African	June 2006	M Tech in Water care	May 2012 (while employed by the	TUT

				Permanent Residence			Department of Water Affairs )	
22	Mr	OB	Akpor	Nigerian	June 2006	D Tech in Water care	May 2009	TUT
23	Mrs	L	*Mpenyana-Monyatsi	South African	2007(Part Time)	D Tech in Water care (completed)	September 2013	TUT
24	Mrs	BBJ	*Mankazana	South African	2008 (Part time)	D Tech in Water care	Not yet	TUT
25	Mrs	C	*Khabo-26Mmekoa	South African	2008 (Part Time)	D Tech in Water care	2019	TUT
27	Ms	AD	Nefale	South African	2008 (Part time while working in the department of Water Affairs)	M Tech in water care	2015	TUT
28	Mr.	P	Muchesa	Zimbabwean	2009	MTech in Water care	April 2013	TUT
29	Mrs.	FE	Adeyemo	Nigerian with South African Permanent Residence	2009	MTech in Water Care	April 2013	TUT
30	Mrs	R	Mathithibane*	South African	2010 (Part time while working in the department of Water Affairs)	MTech in Water Care	2017	TUT
31	Mr.	I	Kamika	Congolese (DRC)	2010	M Tech upgraded to a D Tech in Water Care	September 2013	TUT
32	Miss	JK	Mwabi	Congolese (DRC)	2010	M Tech in Water Care	April 2013	TUT
33	Mr.	GZ	Teklehaimanot	Eritrean	2011	M Tech in Water Care	April 2014	TUT
34	Mr.	LO	Kachienga	Kenyan	2012	M Tech in Water Care	April 2014	TUT
35	Miss	AV	Mboyi	South African	2013	M Tech Water Care	2016	TUT
36	Miss	LM	Baloyi	South African	2013	M Tech in Water Care	2016	TUT
37	Mr	LK	Abia	Cameroun	2013	DTech in Water care	2016	TUT
38	Mr	E	Eroko	Cameroun	2013	MTech in Water care	2017	TUT
39	Mr.	P	Budeli	SA	2014	MTech in Water care	2016	TUT
40	Mr.	B	Mogale	SA	2014	MTech in Water care	2019	TUT

41	Mr.	D	Ekwanzala	DRC	2014	MTech Water care	in 2016	TUT
42	Miss	F	Khaphathe	SA	2014	MTech Water care	in 2017	TUT
43	Miss	H	Chuene	SA	2014	MTech Water care	in 2019	TUT
44	Miss	V	Weber	DRC	2014	MTech Water care	in 2017	TUT
45	Mr.	AC	Mecha	Kenya	2014	DTech Chemical Eng	2017	TUT
46	Mr.	LO	Kachieng'a	Kenya	2015	PhD Science	In 2019	TUT
47	Miss	VKT	Phetla	SA	2016	Mtech	2021	
48	Mr.	PI	Dikobe*	SA	2016	MTech (Water Care)	2020	TUT
49	Mrs.	MG	Kibambe	DRC	2016	MTech (water care)	2020	TUT
50	Miss	RC	Moropeng	SA	2016	PhD Science	in 2020	TUT
51	Mr.	TK	Kasongo	RDC	2016	PhD Science	in 2019	TUT
52	Mr.	D	Ekwanzala	DRC	2017	PhD Science	in 2020	TUT
53	Ms	Mboyi	A	SA	2017	PhD Science	in Not Yet	TUT
54	Mr.	P	Budeli	SA	2017	PhD Science	in 2022	TUT
55	Ms	RC	Mahlatse	SA	2017	MTech	2021	TUT
56	Miss	V	Netsianda	SA	June 2017	MTech	2022	TUT
57	Ms	K	Ramalet	SA	June 2017	MTech	2021	TUT
58	Miss	GMT	Mphephu	SA	2018	MTech	2022	TUT
59	Miss	OTW	Mochware	SA	2019	Master Applied Science	Not Yet	TUT
60	Ms	M	Mudau	SA	2019	Master Applied Science	Not yet	TUT
61	Ms	DP	Mothiba	SA	2019	Master Applied Science	Not yet	TUT
62	Ms	B	Mogale	SA	2019	Master Applied Science	Not Yet	TUT
63	Ms	JM	Sekgobela	SA	2019	Master Applied Science	Not Yet	TUT

64	Ms	A	Murei	SA	2019	PhD Science	in	Not yet	TUT
65	Mrs	G	Kibambe	DRC	2021	PhD Science	in	Not yet	TUT
* Staff Development									

## 5.2 Co-Supervision Record

	Title	Initials	Surname	Nationality	Year	University
66	Miss	LP	Lukhele	Swaziland	2007-2009	Department of Chemical Technology, University of Johannesburg
	Mrs	NH	Mthombeni	South African	2009-2011	Department of Chemical and Metallurgical Engineering, TUT
67	Mr	TO	Mahlangu	Swaziland	2010-2011	Department of Chemical Technology, University of Johannesburg
68	Ms	SC	Motshekga	South African	2016	Department of Chemical and Metallurgical Engineering, TUT
70	Mrs	G	Kibambe	DRC	2021	Water Care TUT

## 5.3 Postdoctoral fellow and visiting scientist record

Title	Initials	Surname	Nationality	Year	Postdoctoral fellow/Visiting Scientists	University
Dr	K.	Walt	American	2004	Visiting Scientist	Fort Hare
Dr	AL	Okoh	Nigerian	2005	Postdoctoral fellow	Fort Hare
Dr	N.	Wery	French	2008	Visiting Scientist	TUT
Dr	JJ	Godon;	French	2008	Visiting Scientist	TUT
Dr	M.	Torrijos	French	2008	Visiting Scientist	TUT
Dr	A	Battimel,	French	2008	Visiting Scientist	TUT
Dr	G	Nameni	American	2009	Postdoctoral fellow	TUT
Dr	E.	Madoroba	Zimbabwean	2010	Postdoctoral fellow	TUT
Dr	S	Sekar	Indian	2013	Postdoctoral fellow	TUT
Dr	J	Keshri	Indian	2014	Postdoctoral fellow	TUT
Dr	I	Kamika	DRC	2014	Postdoctoral fellow	TUT



Dr	LO	Kachieng'a	Kenya	2019	Postdoctoral fellow	TUT
Dr	R	Ngobeni	SA	2019	Postdoctoral fellow	TUT
Dr	JO	Unuofin	Nigeria	2019	Postdoctoral fellow	TUT
Dr	C	Moropeng	SA	2021	Postdoctoral Fellow	TUT

#### 5.4 Foreign students - Internship under supervision

No	Title	Initials	Surname	Nationality	Date of Supervised	Degree
1	Miss	L M	Audrain	French	2014	Diploma in Biological Engineering, Paris Est Creteil
2	Mr.	ALEF	Leduc	French	2014	Diploma in Biological Engineering, Paris Est Creteil
3	Miss	L	Da Silva	French	2014	Diploma in Biological Engineering, Paris Est Creteil
4	Mr.	D	Perteghella	Italy	2016	Master Degree, Environmental and Territory Engineering, University of Trento

## 6. PUBLICATIONS AND CONFERENCES

### 6.1 Refereed/Peer-Reviewed Articles in Accredited Journals

1. **Momba MNB** and Cloete (1996) The relationship of biomass to phosphate uptake by *Acinetobacter junii* in activated sludge mixed liquor. *Water Research*, 30 (2), 364-370. (IF-5.323)
2. **Momba MNB** and Cloete (1996) Biomass relationship to growth and phosphate uptake of *Pseudomonas fluorescens*, *Escherichia coli* and *Acinetobacter radioresistens* in mixed liquor medium. *Journal of Industrial Microbiology*, 16, 364-369. (IF- 2.50)
3. **Momba MNB**, Cloete TE, Venter SN and Kfir R (1998) Evaluation of the impact of disinfection processes on the formation of biofilms in potable surface water distribution systems. *Water Science and Technology*, 38 (8-9), 283-289. (IF-1.21)
4. **Momba MNB**, Cloete TE, Venter SN and Kfir R (1999) Examination of the behaviour of coliform bacteria in biofilms established in laboratory-scale units receiving chlorinated and chloraminated groundwater. *Water Research*, 33 (13), 2937-2940. (IF-5.323)

5. **Momba MNB**, Kfir R, Venter SN and Cloete TE (2000) An overview of biofilm formation in potable water distribution systems and its impact on the deterioration of water quality. *Water South Africa*. 26 (1), 59-66. (IF-0.80)
6. **Momba MNB**, Cloete TE, Venter SN and Kfir R (2000) Influence of disinfection processes on microbial quality of potable groundwater in distribution systems. *Journal of Water Supply Research and Technology - Aqua* 49 (1), 23-33. (IF-0.52)
7. **Momba MNB** and Binda (2002) Combining chlorination and monochloramination processes for the inhibition of biofilm formation in drinking surface water system models. *Journal of Applied Microbiology* 92, 641-648. (IF-2.38)
8. **Momba MNB** and P. Kaleni (2002) Regrowth and survival of indicator micro-organisms on the surfaces of household containers used for the storage of drinking water in rural communities of South Africa. *Water Research*. 36, 3023-3028. (IF-5.323)
9. **Momba MNB** and TL Notshe (2003) The microbiological quality of groundwater-derived drinking water after long storage in household containers in a rural community of South Africa. *Journal of Water Supply: Research and Technology-Aqua* (2003) 52 (1): 67–77.
10. **Momba MNB**, Ndaliso S and Binda MA (2003) Effect of a combined chlorine-monochloramine process on the inhibition of biofilm regrowth in potable water systems. *Journal of Water Supply* 3 (1-2), 215-221. (IF-0.50)
11. **Momba MNB** and Makala (2004) Comparing the effect various pipe materials on biofilm formation in chlorinated and combined chlorine-chloraminated water systems. *Water SA*.30 (2), 175-182. (IF-0.809)
12. **Momba MNB**, Z Tyafa and N Makala (2004) Rural water treatment plants fail to provide potable water to their consumers: the Alice water treatment plant in the Eastern Cape Province of South Africa. *South African Journal of sciences*, 100, May/June, 307-310. (IF-1.031)
13. Obi CL., PO Bessong, **MNB Momba**, N Potgieter, A Samie, and EO Igumbor (2004) Profiles of antibiotic susceptibilities of bacterial isolates and physicochemical quality of water supply in rural Venda communities, South Africa. *Water SA*,30 (4) 515-520. (IF-0.809)
14. **Momba MNB**, N. Makala, B Brouckaert, Z. Tyafa, P. Thompson and AC. Buckley (2004) Improving the efficiency and sustainability of disinfection at a small rural water treatment plant. *Water SA*. 30(5), 617-622. (IF-0.809)

15. **Momba MNB**, Makala N., Tyafa Z and BM Brouckaert (2005) A model partnership for sustainable production of safe drinking water for rural communities in South Africa. *South African Journal of Science*, 101, July/August , 335-336. (IF-1.031)
  
16. **Momba MNB**, V.K. Malakate and J. Theron (2006) *Abundance* of pathogenic *Escherichia coli*, *Salmonella typhimurium* and *Vibrio cholerae* in Nkonkobe drinking water sources. *Journal of Water Health* 04, 289-296. (IF-1.458)
  
17. Obi CL, Onabolu B, **MMB Momba**, JO Igumbor, J Ramalivhana, PO Bessong, EJ Van Rensburg, M Lukoto ( Diseased ), E.Green, TB, Mulaudzi ( 2006 ). The interesting Cross-paths of HIV/AIDS and Water in Southern Africa with special reference to South Africa. *Water SA* 32(3): 323-343. (IF-0.809)
  
18. **Momba MNB.**, Tyafa Z , Makala N ., Brouckaert B. M and Obi C. L. ( 2006 ) Safe drinking water still a dream in rural areas of South Africa. Case Study : The Eastern Cape Province . *Water SA* 32 ( 5 ) : 715-720. (IF-0.809)
  
19. **Momba MNB**, Osode AN and Sibewu M (2006) The Impact of inadequate wastewater treatment on the receiving water bodies – Case study: Buffalo City and Nkonkobe Municipality of the Eastern Cape. *Water SA* 32(5): 687-692. (IF-0.809)
  
20. Obi CL., Ramalivhana J, **Momba MNB**, Onabulu B, Igumbor JO, Lukoto M, Mulaudzi TB, Jansen van Rensburg EL, Green E and Ndou S (2007) Antibiotic resistance profiles and relatedness of enteric bacterial pathogens isolated from HIV/AIDS patients with and without diarrhoea and their household drinking water in rural communities in Limpopo Province-South Africa. *African Journal of Biotechnology*. 6 (8):1035-1047. (IF-0.57)
  
21. Obi CL, **Momba MNB**, Samie A, Igumbor JO, Green E and Musie E (2007) Microbiological, physico-chemical and management parameters impinging on the efficiency of small water treatment plants in the Limpopo and Mpumalanga Provinces of South Africa. *Water SA* 33(2): 1-9. (IF-0.809)
  
22. Obi CL., Ramalivhana J, **Momba MNB**, Onabulu B, Igumbor JO (2007) Scope and Frequency of enteric bacterial pathogens isolated from HIV/AIDS patients and their household drinking water in Limpopo province. *Water SA* , 33 (4) 1-10. (IF-0.809)
  
23. Akpor OB. **Momba MNB** and Okonkwo J. (2007) Phosphate and nitrate removal by selected wastewater protozoa isolates. *Pakistani Journal of Biological Sciences*, 10(22), 4008-4014. (IF: 0.73)
  
24. Akpor OB, **Momba MNB** and Okonkwo J.(2008) Effect of Nutrient/Carbon Supplements on biological phosphate and nitrate uptake by protozoan isolates. *Journal of Applied Sciences*. 8 (3) 489-495.

25. Akpor OB, **Momba MNB** and Okonkwo J.(2008) Relationship of carbon sources concentration to nutrient uptake by protozoa in Activated sludge mixed liquor. *Research Journal of Environmental Sciences* 2(5):330-339 (IF:0.41)
  
26. Akpor OB, **Momba MNB** and Okonkwo J.(2008) The effects of pH and temperature on phosphate and nitrate by wastewater protozoa. *African Journal of Biotechnology*,7(13), 2221-2226. (IF-0.57)
  
27. Abongo BO, **Momba MNB** and Mwambakana JN (2008) Prevalence and antimicrobial susceptibility of *Escherichia coli* O157:H7 in vegetables sold in Amathole district, Eastern Cape Province of South Africa. *Journal of Food Protection* 71 (4), 816-819. (IF-1.849)
  
28. Abongo BO, **Momba MNB** and Rodda N (2008) Health Risk of *Escherichia coli* O157:H7 in drinking water and meat and meat products and vegetables to diarrheic confirmed and non-confirmed HIV/AIDS patients. *Journal of Applied Sciences* 8(8):1453-1461 (IF)
  
29. Abongo BO, **Momba MNB** and Mwambakana JN (2008) Prevalence of *Escherichia coli* O157:H7 among diarrhoeic HIV/AIDS patients in the Eastern Cape province –South Africa. *Pakistani Journal of Biological Sciences*, 11(8), 1066-1075 (IF 0.73)
  
30. Abongo BO and **Momba MNB** (2008) Prevalence and potential Link between *E. coli* O157:H7 isolated from drinking water, meat and vegetables and stools of diarrhoeic confirmed and non-confirmed HIV/AIDS patients in the Amathole District – South Africa. *Journal of Applied Microbiology*. *Journal of Applied Microbiology* **105**, 424-431. (IF-2.38)
  
31. Sibewu M, **Momba MNB** and Okoh AL (2008) Protozoan fauna and abundance in aeration tanks of 3 municipal wastewater treatment plants in the Eastern Cape province of South Africa. *Journal of Applied Sciences*.8(11),2112-2117. (IF)
  
32. **Momba MNB**, Abongo BO and Mwambakana JN (2008) Prevalence of enterohaemorrhagic *Escherichia coli* O157:H7 in drinking water and its predicted impact on diarrhoeic HIV/AIDS patients in the Amathole District, Eastern Cape Province, South Africa. *Water SA Water SA* ,34(3/7), 365372. (IF-0.809)
  
33. Akpor OB, **Momba MNB**, Okonkwo JO and Coetzee MA (2008) Nutrient removal from activated sludge mixed liquor by wastewater protozoa in a laboratory –scale system batch reactor. *International Journal of Environmental Science and Technology* 5 (4), 463-470. (IF-2.334)
  
34. Akpor OB, **Momba MNB** and Okonkwo JO (2008) Protozoan biomass relationship to nutrient and COD removal in activated sludge mixed liquor. *Biotechnology Journal* 3, 1-5. (IF-3.781)

35. CL Obi, JO Igumbor, **MNB Momba** and A Samie (2008) Interplay of factors involving chlorine dose, turbidity flow capacity and pH on microbial quality of drinking water in small water treatment plants. *Water SA*, 34 (5), 565-572. (IF-0.809)
  
36. Benard O. Abongo, **MNB Momba** (2009) Prevalence and characterization of Escherichia coli O157:H7 isolates from meat and meat products sold in Amathole District, Eastern Cape Province of South Africa. *Food Microbiology* 26 (2009) 173–176. (IF-3.682)
  
37. **Momba MNB**, CL Obi and P. Thompson (2009) Survey of disinfection efficiency of small drinking water treatment plants: Challenges facing small water treatment plants in South Africa. *Water SA* 35 (4) 48-5494. (IF-0.80). (IF-0.809)
  
38. Samie, A., Obi, C. L., Igumbor, J. O. and **Momba MNB**. (2009) Focus on 14 sewage treatment plants in the Mpumalanga Province, South Africa in order to gauge the efficiency of wastewater treatment. *African Journal of Biotechnology* Vol. 8 (14), pp. 3276-3285, 20 July, 2009. (IF-0.57)
  
39. **Momba MNB** and M Sibewu (2009) Survival of somatic and F-RNA coliphages in treated wastewater effluents and their impact on viral quality of the receiving water bodies in the Eastern Cape Province. *Journal of Biological Sciences* 9(7) 648-654 (IF 0.63)
  
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- 105.** Achisa C Mecha, Maurice S Onyango, Aoyi Ochieng, and **Maggy NB Momba** (2017) Photocatalytic ozonation treatment of municipal wastewater. The 14th IWA Leading Edge Conference on Water and Wastewater Technologies, Florianopolis, Brazil 29 May – 02 June 2017.
- 106.** Achisa C Mecha, Maurice S Onyango, Aoyi Ochieng, and **Maggy NB Momba,** (2017). Synthesis, characterization and evaluation of TiO<sub>2</sub> for UV and solar photocatalytic treatment of municipal wastewater. 2nd International Conference on Energy, Environment and Climate Change (ICEECC 2017), 5 - 7 July 2017, Le Meridien Hotel Pointe aux Piments Mauritius.
- 107.** LK Abia, GZ Teklehaimanot and **MNB Momba** (2018) Predictability of potential health risks associated with microbial pathogens exposure from untreated river waters and sediments around Gauteng South Africa using quantitative risk microbial assessment. International Conference, Water Science for Impact. Oral Presentation. 16-18 October Orion Wageningen, The Netherlands.
- 108.** Vanessa Weber, Ilunga Kamika and **Maggy NB Momba** (2018) Degradation of zinc oxide and titanium dioxide nanoparticles by indigenous moderately halophilic bacteria in wastewater. Platform presentation. IWA World Water Congress & Exhibition 2018. 16-21 September 2018. Tokyo/Japan
- 109.** Mboyi, A., Kamika, I., Mokgalaka, N.S. & **Momba, M.N.B.** (2019). Fabrication of freshwater algae to synthesis metal and metal oxide nanomaterials: Antimicrobial

activity, Oral Presentation, international Young water Professionals, Canada, Toronto, 23-27 June 2019

110. Colette Khabo-Mmekoa and **Maggy Ndombo Benteke Momba** (2019) Impact of social disparities on microbiological quality of drinking water supply and health of HIV/AIDS infected individuals: A case study in Ugu District Municipality. Oral Presentation. 20th Symposium on health-related water microbiology. Vienna, Austria. 15-20 September 2019.
111. Ekwanzala, M. D., Dewar, J. B., Kamika, I., & **Momba, M. N. B.** (2019). Dissemination of antibiotic-resistant bacteria from hospital wastewater to the aquatic environment. Speaker. Reclaimed Water & Occupational Health Risks Workshop. 25 July 2019, NHLS, Johannesburg, South Africa.
112. Ekwanzala, M. D., Dewar, J. B., Kamika, I., & **Momba, M. N. B.** (2019). Tracking the environmental dissemination of carbapenem-resistant *Klebsiella pneumoniae* using whole-genome sequencing. Oral Presentation. Conference on Genomics, Proteomics and Metabolomics: All in Bioinformatics (CGPMG-2019). 27-28 July 2019, Empangeni, South Africa.
113. Ekwanzala, M. D., Dewar, J. B., Kamika, I., & **Momba, M. N. B.** (2019). From hospital wastewater to receiving waterbodies: dissemination of antibiotic-resistant bacteria. Poster with a 3 min Platform Presentation. 20th International Symposium on Health-Related Water Microbiology. 15-20 September 2019, Vienna, Austria.
114. Ekwanzala, M. D., Dewar, J. B., Kamika, I., & **Momba, M. N. B.** (2019). Comparative genomics of environmental vancomycin-resistant *Enterococcus* spp.: from hospital wastewater to water resources. Oral Presentation. 6th South African YWP Biennial Conference. 20-23 October 2019, Durban ICC, South Africa.
115. Ekwanzala, M. D., Dewar, J. B., Kamika, I., & **Momba, M. N. B.** (2019). Dissemination of antibiotic-resistant bacteria from hospital wastewater to the aquatic environment. Speaker. World Antibiotic Awareness Week (WAAW). 18 November 2019, University of Johannesburg, Johannesburg, South Africa.
116. Ekwanzala, M. D., Dewar, J. B., Kamika, I., & **Momba, M. N. B.** (2019). Resistome risks of wastewaters and aquatic environments deciphered by shotgun metagenomic assembly. Oral Presentation. The First Stellenbosch University African Microbiome Workshop and Symposium. 28 – 30 November 2019, STIAS, Stellenbosch, South Africa.
117. Ekwanzala, M. D., Dewar, J. B., & **Momba, M. N. B.** (2020). GenoTrack, a webtool to geospatially link bacterial genomes from water, food and clinical environments. Oral Presentation. Water Institute of Southern Africa (WISA) 2020 Virtual Conference. 07 - 11 December 2020, South Africa.
118. Raseala CM, Ekwanzala MD, Kamika I and **Momba MNB** (2020) Multilocus-based phylogenetic analysis of extended-Spectrum beta lactamase Escherichia coli O157: H7 uncovers related strains between agriculture and nearby water sources. Oral Presentation. Water Institute of Southern Africa (WISA) biennial virtual conference. 7-11 December 2020. South Africa



119. Ramaite, K., Ekwanzala, M.D., Dewar, J.B., & **Momba, M.N.B.** (2020). Occurrence and molecular characterization of extended-spectrum beta-lactamase-producing Shiga toxin-producing *Escherichia coli* from cattle farm to aquatic environments. Poster Presentation. WISA 2020 Virtual Conference. 7-11 December 2020. Online Conference, WISA, South Africa.
120. Netsianda vision, Coetzee AA Marthie & **Momba NB Maggy** (2020). The effect of nonylphenol and dibutyl phthalate in the isolation and growth response of bacteria and protozoa. Oral presentation. WISA 2020 online conference. 7-11 December 2020. Johannesburg, South Africa
121. Colette Khabo-Mmekoa and **Maggy Momba** (2020). Establishing the association of enteropathogenic bacteria of household stored water and diarrhoeal stool. Oral presentation WISA 2020 Virtual Conference. 7-11 December 2020. Sandton Convention Centre, Johannesburg, South Africa.

## 8.0 Other significant conference outputs

1. LP Lukhele, RWM Krause, **MNB Momba** and BB Mamba (2008) Application of silver impregnated carbon nanotubes and cyclodextrin polymers, for the destruction of bacteria in water -.Oral Presentation during Water Research Showcase. 15 August. Tshwane University of Technology. Pretoria
2. M Dungeni, **MNB Momba** and RR van der Merwe (2008) Activated sludge performance monitoring of four sewage treatment plants in northern Gauteng and its relation to water pollution control of receiving water bodies- Oral Presentation during Water Research Showcase. 15 August. Tshwane University of Technology. Pretoria.
3. CMN Khabo-Mmekoa, **MNB Momba**, CL Obi (2008).Health impact of water-borne pathogens in rural domestic water on HIV/AIDS infected individuals in Kwazulu-Natal province, South Africa- Oral Presentation during Water Research Showcase. 15 August. Tshwane University of Technology. Pretoria.
4. **Momba MNB** (2011) Water management to improve the safety of produce and processed foods. Key Speaker during South African Association for Food Science & Technology Water Safety and Quality Workshop. 14 June. Pretoria/South
5. Kachieng'a, L & **Momba, MNB.** (2012). Biodegradation of crude oil spill by-products (petroleum) polluted wastewater by selected protozoan isolates. **Oral presentation.** *Seminar on Egypt-South Africa Water Research and Innovation Collaboration (WRIC)*. 19 November 2012, Tshwane University of Technology, Arcadia Campus, Pretoria, South Africa.
6. **Momba MNB** (2014) Water and Wastewater Management for the Sustainability of Water Resources-Where is Africa. Public lecture-University of Wisconsin and Milwaukee Global Water Centre. 27 September - 4October. USA.

## 9.0 Prototypes

1. **Momba MNB**, G. Nameni and CermaLab (2009) A prototype nanotechnology-based clay filter pot (Silver impregnated porous pot: SIPP) to purify water for drinking and cooking in rural homes.

2. **Momba MNB**, GZ Teklehaimano and CermaLab (2013) Biosand Zeolite Silver Impregnated Clay Granular Filter to purify water for drinking and cooking in rural homes.

3. Mpenyana-Monyatsi L and **Momba MNB** (2012) A silver nanoparticle-cation resin filter system for drinking water purification

4. **Momba MNB** and Achisa Mecha Cleophas (2016) A prototype-based solar radiation-ozonation coupled system for the treatment of wastewater using metal doped titanium dioxide.

## 10. Products

1. Kamika I and **MNB Momba** (2013) - 16S rRNA gene sequence of the isolate MWI-1 (*Marinobacter* sp. MWI-1) that has been deposited in DNA Data Bank of Japan (DDBJ), available under accession number AB793286.
2. Kamika I and **Momba MNB** (2013) - Isolation for the first time of a eukaryotic gene (*van2*) encoding the resistance of vanadium into a prokaryotic cell (*Peranema* - a protozoan species).
3. ALK Abia, E Ubomba-Jaswa, CC Ssemakalu, **MNB Momba** (2015) Development of a new method, known as the “water-displacement method”, which is based on the volume of water displaced by the sediment (sediment volume). This method was found to give a better yield of the sediment-bound *E. coli*, was more time-efficient, required less equipment and was highly reproducible compared to traditionally used approaches. In addition, the better yield obtained with the method reduced the risk of underestimation of the microbial load in the sediments. With the water-displacement method, the comparison of water and sediments *E. coli* counts was facilitated by the expression of both counts in the same units of measurement (MPN/100 mL).
4. Ekwanzala & **MNB Momba** (2016) - 16S rRNA, 23S rRNA, *invA* and *ipaH* gene sequences of the isolated faecal bacteria, *Enterococcus* spp., *Salmonella* spp., and *Shigella* spp. deposited in DNA Data Bank of Japan (DDBJ) and available under the following accession numbers: LC110414 (ECS127F), LC110415 (ECS227F), LC110416 (ECS327F), LC110417 (ECS427F), LC110418 (ECS527F), LC110419 (ECS627F), LC110420 (ECS727F), LC110421 (ECS827F), LC110422 (ECS927F), LC110423 (ECS1027F), LC110424 (ECS1127F), LC110425 (ECS1227F), LC110426 (ECS1327F), LC110427 (ECS1527F), LC110428 (ECS1627F), LC110429 (ECW127F), LC110430 (ECW227F), LC110431 (ECW327F), LC110432 (ECW427F), LC110433 (ECW527F), LC110434 (ECW627F), LC110435 (ECW727F), LC110436 (ECW827F), LC110437 (ECW927F), LC110438 (ECW1027F), LC110439 (ECW1127F), LC110440 (ECW1427F), LC110441 (ECW1527F), LC110442 (ECW1627F), LC111439 (ETW1), LC111440 (ETW2), LC111441 (ETW3), LC111442 (ETW4), LC111443 (ETW5), LC111444 (ETW6), LC111445 (ETS1), LC111446 (ETS2), LC111447 (ETS3), LC111448 (ETS4), LC111449 (ETS5), LC111450 (ETS6), LC111451 (ETS7), LC111452 (ETS8), LC111453 (ETW7), LC111454 (ETW8), LC111455 (ETW9), LC111456 (ETS9), LC111457 (ETS10), LC111458 (ETS11), LC111459 (ETW10), LC111460 (ETS12), LC111461 (ETW11), LC111462 (ETW12), LC111463 (ETS13), LC111464 (ETS14), (SALW2), LC111467 (SALW3), LC111468 (SALW13), LC111469 (SALW14), LC111470 (SALW12), LC111471 (SALW11), LC111472 (SALW10), LC111473 (SALW9), LC111474 (SALS12), LC111475 (SALW01), LC111476 (SALW8), LC111477 (SALS1), LC111478 (SALS2), LC111479 (SALW7), LC111480 (SALS11), LC111481 (SALS10), LC111482 (SALW6), LC111483 (SALS9), LC111484 (SALS8), LC111485 (SALS7), LC111486 (SALS6), LC111487 (SALS5), LC111488

- (SALS4), LC111489 (SALW5), LC111490 (SALS3) LC111491 (SALW4), LC111492 (SHIGW2), LC111493 (SHIGS1), LC111494 (SHIGW3), LC111495 (SHIGW4), LC111496 (SHIGW1), LC111497 (SHIGS2), LC111498 (SHIGS3), LC111499 (SHIGS4), LC111500 (SHIGW5), LC111501 (SHIGS5), LC111502 (SHIGW6), LC111503 (SHIGW7), LC111504 (SHIGW8), LC111505 (SHIGS6), LC111506 (SHIGS7), LC111507 (SHIGW9), LC111508 (SHIGS8), LC111509 (SHIGW10), LC111510 (SHIGS9), LC111511 (SHIGS10), LC111512 (SHIGS11), LC111513 (SHIGS12), LC111514 (SHIGW11), LC111515 (SHIGS13), LC111516 (SHIGW14), LC111517 (SHIGW13) and LC11151 (SHIGW12).
5. Ekwanzala D, Dewar J, Kamika I, **Momba MNB** (2019) *Klebsiella*: The Bioproject accession number for this whole genome sequencing study is PRJNA524761 and each sample was deposited in a Biosample with accession numbers from SAMN10992588 to SAMN10992604. Raw reads were deposited in the Sequence Read Archive with accession numbers from SRR8651533 to SRR8651549.
  6. Ekwanzala D, Dewar J, Kamika I, **Momba MNB** (2019) *Enterococcus*: The current study was registered at the NCBI with a bioproject accession number PRJNA534421. Individual biosamples accession numbers span from SAMN11490016 to SAMN11490029. Individual raw reads from SRR8948878 to SRR8948891 are domiciled in the Sequence Read Archive of the NCBI.
  7. Ekwanzala D, Dewar J, Kamika I, **Momba MNB** (2019) Shotgun metagenomics: Generated raw sequencing data were registered and deposited at the European Nucleotide Archive under accession number PRJEB34690
  8. Ekwanzala D, Dewar J, Kamika I, **Momba MNB** (2019) *Citrobacter koseri*: The whole-genome shotgun sequencing project of this strain was deposited at DDBJ/ENA/GenBank under the BioProject number PRJNA543985 and BioSample accession number SAMN11793481. Raw sequences were deposited in the Sequence Read Archive (SRA) under the accession numbers SRR9099020.

## 11. Patents

**Momba MNB**, RC. Moropeng, P. Budeli and and CermaLab (2016): Water Treatment (Biosand-Zeolite-silver impregnated granular clay filters) *Provisional Patent Specification: 2016/02883*

**Momba MNB** and Ekwanzala D (2020): A computer-implemented genome tracking method and system *Provisional Patent Specification: 2020/04797*

## 12. Monographs, Dissertations/ Theses

1982: Visual disability education in Kinshasa/Democratic Republic of the Congo. Monograph for BA degree (in applied pedagogy). Pedagogic Institute of Gombe, Kinshasa-Zaire.

1983: Prominence of *Escherichia coli* in posterior intestine of different types of fish: *Bagrus* (*Bagridae*), *Citharinus* (*Citharinidae*), *Distichodus* (*Citharinidae*), *Labeo* (*Cyprinidae*), *Mormyrus* (*Mormyridae*). BSc dissertation (in Biology). University of Kisangani, Kisangani, DRC (Zaire).

1985: Identification of selected *Enterobacteraceae* from the digestive tracts of *Citharinus congicus*. BSc Honours dissertation (in Biology). University of Kisangani, Kisangani, Democratic Republic of Congo (Zaire).

1995: Phosphate removal in activated sludge and its relationship to biomass. MSc thesis (in Microbiology). University of Pretoria, South Africa.

1997: The impact of disinfection processes on biofilm formation in potable water distribution systems. PhD thesis (in Microbiology). University of Pretoria. South Africa

### **13. Evidence of National and International Eminence**

2006 – Current: Member of Water Institute of Southern Africa

2002-current Member of International Water Association-Southern Africa National (WISA) Committee

2003 Chair of the session-Microbial Interaction with Biofilms in the Health-related water Microbiology-IWA Symposium-Cape Town

2005 Invited by INRA (Institute National de Recherche Agronomique) and Laboratoire de Biotechnologie de l'Environnement - Narbonne/ France to give a public lecture during the INRA Laboratory seminar series.

2006 Chair of the session during the WISA Appropriate Technology Conference, Umhlanga Rocks, KwaZulu Natal, 1-2 November 2006

2008 Invited by the University of Illinois Urbana-Champaign to give a key address and public lecture during the 2008 WaterCAMPWS Spring Seminar Series.

2008 Chair of the session during the WISA Biennial Conference-Sun City May 2008-08-14.

2008- 2014 Member of *Water SA* Editorial Board.

2008 Invited by the Department of Water Affairs and Forestry to escort the Minister and showcase South Africa in terms of wastewater treatment, attract potential investors to invest in South Africa and promote the South African engagement within SADC during the Women's day celebration in Zaragoza, Spain, August 2008.

2008 Chair of the workshop on Nanotechnology and the Global Challenge of access to clean water at the Nanotechnology Northern Europe 2008 conference. Bella Centre, Copenhagen/Denmark, 23-25 September 2008

2008 Invited as a panel member in the discussion on "Barriers to the development and application of cutting-edge nano-enhanced water purification techniques" during the Nanotechnology Northern Europe 2008 conference and exhibition. Bella Centre, Copenhagen/Denmark, 23-25 September 2008

2009 Invited as a speaker at South Africa Nanoscience and Nanotechnology Summer School (SANNSC), held from the 23<sup>rd</sup> November to the 2<sup>nd</sup> December 2009, at Farm Inn Lodge, Pretoria/South Africa.

2010 Key speaker during a two days summit organized by the South African Local Government Business Network. Theme: Infrastructure Development and Financing beyond 2010. 24-25 May 2010. Emperors Palace/Kempton Park/ Gauteng, Pretoria.

- 2011 Chair of the session during the WISA Municipal Water Quality Conference, 28--1 July, Cape Town International Conference Centre,/South Africa.
- 2011 Invited as a speaker by the South African Association for Food Sciences & Technology (SAAFoST) during the SAAFoST Northern Branch Water Safety and Quality Workshop, held on 8 July 2011 at Woodmead - auditorium B, ground floor. Pretoria, SA.
- 2011 Invited as a facilitator by the Academy of Sciences of South Africa (ASSAF) and the Global Network of Science Academies during a workshop held on 28-29 July at ASSAF Offices in Pretoria/South Africa on " The State of Water in Southern Africa: A Focus on Mauritius, Mozambique, Namibia, South Africa, Zambia and Zimbabwe".
- 2011 Invited by the University of Johannesburg to give a key address- "Looking beyond the brink of water and crises! what crises, really! during Prof Bhekie Mamba's inaugural lecture for his full professorship in the Department of Chemical Technology.
- 2012 Invited to give a public lecture during the 1st Biotechnology World Congress held on the 14th-15th February at Dubai Men's College.
- 2012 Recognized as one of the Water Research Champions and invited by the Cape Peninsula University of Technology to participate to the post-WISA Conference Workshop on 10<sup>th</sup> May 2012. at the CPUT's Bellville Campus. The aim of the workshop is to bring all the water research champions together so as to leverage the collective wisdom in water research.
- 2012 Recognized by University of Cape Town as a key specialist and experienced practitioner in the water sector and invited to participate in the Aqua UCT Water Research Horizon Scanning Workshop.
- 2013 South African National (SARChI) Chair holder for Water Quality and Wastewater Management.
- 2014 Invited by the European Commission's Directorate-General for Research and Innovation and the Greek Presidency of the Council of the European Union as a speaker at the Industrial Technologies 2014 conference, April 9 – 11, Athens/Greece
- 2014 Invited to deliver public lectures at University of Wisconsin and Milwaukee Global Water Centre. 27 September - 4October. USA.
- 2014 Invited as a Keynote Speaker during the 2nd symposium on UV disinfection in developing countries. 6 November. UNESCO-IHE/Delft. The Netherland.
- 2014- Member of WHO Independent Advisory Committee (IAC) acting as the advisory body to WHO on the International Evaluation Scheme for Household Water Treatment Technologies, managed by the Water, Sanitation, Hygiene and Health Unit (WSH) located. Geneva-Switzerland.
- 2016 Invited to contribute to a new online knowledge platform that focused on a new edition of "Sanitation and disease health aspects of excreta and wastewater

management” (Feachem et al, 1983) through the Global Water Pathogen Project (GWPP), a project sponsored by UNESCO under the leadership of Michigan University, USA.

- 2016 Recognised by the Planet Earth Institute (PEI) as one of the ten 2016 Science Heroes, the most inspirational people working in and passionate about science in Africa. PEI is a charity institution working for the scientific independence of Africa and is always keen to celebrate the amazing men and women who are making a difference in science on the continent.
- 2017 Invited as a Keynote speaker during the Big Ideas for Africa: Celebrating the Continent's Science and Technology Pioneers. Unconference organised by the Planet Earth Institute . 20 July 2017. London/UK. The Keynote focused on Nanotechnology-based Filters : A Solution for Tackling Waterborne Diseases in Africa
- 2017 - Invited by the Stellenbosch University to give a keynote address during the Postdoctoral fellows’ conference held on the 23rd October 2017. The keynote address focused on the “Decentralised Drinking Water Technologies: A Solution to Provide Access to Safe Drinking Water to All in Africa”.  
Invited to panel
- 2019 Selected among the three-esteemed Health-Related Water Microbiology (HRWM) VIP panelists, during the discussion on the selected topics of the symposium with special focus on Sustainable Development Goal 6 during the 2019 HRWM symposium in Vienna/Austria, 15-20 September.
- 2019 Received the leadership excellence award by the Global Water Pathogen Project during the 20th symposium on HRWM, Vienna/Austria 15 and 20 September 2019.
- 2019-2020 Appointment as an external committee member: University of Limpopo -NRF Customised Intervention Project for the diagnosis of University of Limpopo (UL) Women Academics readiness for rating. South Africa
- 2021 Recognised as one of the Legends of Water Research in South Africa and received an award for “Water Legacy” by the Water Research Commission, South Africa.

#### **14. Other National and International Contributions**

##### ***Reviewer of manuscripts for publication***

- 1997-current Journal of Water Research
- 1998-current Journal of Water SA
- 2001-current South African Journal of Science
- 2001-current Journal of Science and Technology
- 2002-current Journal of Water SRT-Aqua
- 2004- Current Journal of Applied Microbiology
- 2005-Current Journal of Environmental Management
- 2007- Current Journal of Water and Health
- 2012-Current Journal of Water Resource and Protection (JWARP)
- 2012 - Current International Journal of Environmental Research and Public Health
- 2012 -Current Physics and Chemistry of the Earth

2015 – current Science of the Total Environment  
2020 – current Frontiers in Microbiology

***Reviewer of manuscripts of conference proceedings***

1998 -2000 International Association on Water quality  
1999-Current International Water Association (IWA) World Congress  
2012- Current WaterNet/WARFSA/GWP-SA International Symposium

**Reviewer of Research Proposals for funding**

2001-current Water Research Commission-SA  
2001-current National Research Foundation-SA  
2004-Current NRF Advisory Panel (for research funding) for the conservation and Management of ecosystems and Biodiversity Focus Area and the Sustainable livelihoods: Eradication of Poverty Focus area

2015 - current South Africa Medical Research Council  
2019 – Current The French National Research Agency.

***Membership of National and International Scientific Committees***

1996-current Member of International Association for Water Quality/International Water Association (IWA)  
1996-current Member of Member of Water Institute of Southern Africa Research  
1997-2006 South African Society of Biochemistry and Molecular Biology in Eastern Cape Water  
1999-current Water Research Commission (WRC) steering committees for research projects at different Universities, Universities of Technologies, and Research Institutions  
1999 -2000 International Advisory Board member of the South Africa Centre for Essential Community Services  
2000 Member of WRC focus group for strategies plan in health-related water fields  
2002 Member of South African Advisory committee for Genetically Modified Organisms (GMO)  
2003 Member of the organizing committee of Health-related water microbiology-IWA symposium-Cape Town  
2005 - current Member of DNA Barcoding of Life  
2012 - current Member of the 13th WaterNet/WARFSA/GWP-SA International Symposium organizing committee on Integrated Water Resource Management that will be held on 31 October – 2 November 2012, Birchwood Hotel, Johannesburg, South Africa.  
2016 – current Member of Global Water Pathogen Project (GWPP)  
2018- current Member of IWA Task Group on Sustainable Water Use by Industry

***Consultancy***

2000 Naledi Foundation -2000. I assisted Naledi Foundation on the development of strategies ensuring sustainable effective household treatments of drinking water in rural s of South Africa.  
2003 Sibambene Trade &Service (Pty) Ltd, Evaluation of polydex as an alternative disinfectant for the treatment of drinking water in rural areas of South Africa  
1999- Current Water Research Commission  
1999 – Current Eastern Cape District Municipality  
2007- Current Ugu District Municipality- KwaZulu Natal Province and Limpopo Province  
2012 -2013 Johannesburg Water, South Africa.

## 15. Contribution in Teaching

*Courses/Modules/Units taught during the year.*

**a. University of Fort Hare** : July 1997 up to March 2006

*Subjects for third year:*

MIC 312 - Immunology, Virology and Antimicrobial Chemotherapy.

MIC 321 - Molecular Biology and Genetic Engineering

*Subjects for Honours Degree:*

MIC 502: General microbiology

MIC 503 - Molecular Biology and Genetic Engineering

MIC 505 Practical and Project presentation

MIC 506 – Seminar and Methodology of Research

**b. Tshwane University of Technology** – March 2006 -Current

*Subject: Methodology of Research – Btech,*

*Supervision of MTech and DTech students*

## 16. Other Contribution to Research

- 1998 – March 2006      *Leader of the Fort Hare Water Research Group (FHWRG)*
- 2002 – March 2006:      *Establishment of a modern molecular diagnostic Laboratory that never existed at Fort Hare. This led to introduce undergraduates and Post graduate students on the novel molecular study.*
- 2002 – March 2006      *Head and Coordinator of the Molecular Diagnostic Laboratory (MDL).*
- 2003 – March 2006      *Leader of the Research Niche Area “The Eastern Cape Water Resources: Use and Protection for sustainable rural development”, recognized by NRF (at The University of Fort Hare).*
- April 2006-Current      *Leader of the Niche Area “Management of Water and Wastewater for The Sustainability of Water Resources and Eradication of Waterborne Diseases in South African rural communities” (Tshwane University of Technology). This Research NA has been considered as the best NA at TUT every year.*
- April 2006 –Current      *Leader of TUT Water Research Group*
- 2013 – Current          *South African Chair holder (SARChI) for Water Quality and Wastewater Management.*

## 17. Focus of Water Research

- *To better understand the impact of water sources and drinking water on the health of the rural communities and to develop strategies for the protection of water resources as well as public health in a cost-effective way, keeping abreast of international trends and technology.*
- *To strive towards a better understanding of the origin, survival and effect of microorganisms associated with drinking water and develop strategies, which allow rapid diagnosis of waterborne infections and their control.*

### 17.1 Areas of research within water quality and wastewater management



## **Treatment of wastewater for the protection and long-term sustainability of water resources and public health**

Bioremediation of phosphate, nitrogen, heavy metals, hydrocarbons and chlorinated solvents by wastewater microorganisms to inhibit pollution of surface water sources with special reference to wastewater and Industrial effluents.

Management of groundwater quality requires both the protection of aquifers and groundwater from ingress of pollutants and also the remediation and treatment of polluted resources. Research in this area include: i) Groundwater quality monitoring to assess actual groundwater quality status and changes to quality over time, ii) Assessment of aquifer pollution vulnerability, iii) Mapping of groundwater pollution hazards and iv) Development a groundwater pollution management model.

## **Development of cost-effective technologies and novel strategies to secure adequate clean and safe drinking water to communities and ensure public health**

Understanding of the origin, survival and effect of micro-organisms associated with water sources and developing molecular strategies, which will allow rapid diagnosis of waterborne infections and their control.

Prevention and control of the transmission of waterborne diseases by domestic drinking water supplies in rural areas through development of strategies to improving sustainable and effective disinfection in small rural water treatment plants and household point of use treatments

Use of combined disinfection processes to ensure the maintenance of the microbiological quality of potable water at the point of treatment as well as in household containers during the storage of drinking water with emphasis on the control of biofilm regrowth.

Assessment of the human health risk associated with microbiological and chemical hazards in rural community drinking water sources, with emphasis on immuno-compromised people (HIV/AIDS patients) and TB patients.

Impact of irrigation on the microbiological quality of fruit and vegetables and its risk on the health of the rural community.

## **Social acceptance factors and developing strategies for the adoption of appropriate technologies and on-site training**

Identifying the most important factors that determine the rates of diffusion and patterns of social acceptance of the novel technologies mentioned above and which solely and in combination are intended to assist in preventing water resource pollution and in providing clean and safe drinking water to populations residing in both urban and rural settings.  
protect

On-site training of small water rural water supply operators for technology transfer and rural community-based education for the treatment of safe drinking water in homes and during storage.

## **Summary of completed and non-completed research projects**

1993-1995: Optimisation of wastewater treatment with emphasis on the phenomenon of enhancement phosphate removal by the activated sludge system (Biotechnology Laboratory of Prof. T.E. Cloete - University of Pretoria). **Funded by Eskom**

1995-1997: The role that biofilm plays in the deterioration of potable water quality in distribution systems and its effect on the outbreak of waterborne diseases (As a researcher at the Health programme of the Division of Environment and Forestry Technology - Council for Scientific and Industrial Research (CSIR) - Pretoria/South Africa (1995-1997) and PhD postgraduate student at the University of Pretoria). **Funded by C.S.I.R**

1998-2002: Household container-stored water quality problems associated with the quality of drinking water in developing countries. The present study showed how and why the water supply in South African rural areas may influence the quality of container-stored waters in households and consequently infection and disease in the communities. **Funded by the National Research Foundation (NRF)**

1999-2002: Inhibition of bacterial and biofilm regrowth in a chlorinated potable water system. The ultimate aim of this study was to evaluate a combined chlorine-monochloramine disinfection process for the inhibition of bacterial and biofilm regrowth in a water system. **Funded by the Water Research Commission (WRC)**

2000-2002: A comparative study which allowed the identification of the effect of various pipe materials on biofilm formation in a combined chlorine-monochloramine potable water system was conducted. **Funded by the WRC**

2002 -2003: Strategies ensuring sustainable effective disinfection in small rural water supplies through the development of a partnership between researchers at the Universities and rural municipalities. The present project resulted in Guidelines that assist small municipal water treatment in rural areas of South Africa to ensure sustainable disinfection from the point of consumption. **Funded by the WRC**

2003-2004: Efficiency of polydex as an alternative disinfectant for the treatment of drinking water in rural communities of South Africa was conducted. **Funded by Sibambene Trade & Services (Pty), Ltd**

2003- 2008: Protozoan predation, a study designed to obtain information on how protozoa can remove faecal indicator and pathogenic microorganisms in the activated sludge system. **Funded by NRF, WRC and France**

2004-2006: Improving the efficiency of disinfection in small water treatment plant. The purpose of the study was to provide guidelines for the improvement of the efficiency of disinfection of the final water in small drinking water treatment. **Funded by WRC**

2005-2006: On-site mobile training of operators in small rural water supplies. In our previous studies, it was found that most of the operators who operate rural small water treatments lack the knowledge of plant operational processes. Even when an attempt was made to offer training, the level of the materials used was beyond the educational level of the operators. To make sure that theoretical knowledge of water treatment operators goes together with direct implementation of that knowledge according to the condition of each plant, we conducted this project, which resulted in an illustrative kit for the training of operators. **Funded by WRC**

2004-2008: The link between *Escherichia coli* O157:H7 isolated from drinking water, meat and vegetables and the health condition of HIV/AIDS individuals. This project focused on the establishment of a molecular link between *E. coli* O157:H7 isolated from the environmental samples and from HIV/AIDS and non-HIV/AIDS patients who visited Frere Hospital in the Amatole District of the Eastern Cape Province. This enabled us to trace the sources of *E. coli* O157:H7 that might act as potential causes of disease outbreaks in humans. **Funded by the NRF.**

2004-2012: Linkage between water quality and the health condition of HIV/AIDS individuals in South Africa. **Funded by NRF and TUT**

2006- 2009: Compliance of non-metropolitan South African potable water with accepted drinking water quality and management guidelines and Norms. **Funded by WRC**

2006 – 2015: The role of protozoa and bacteria in the removal phosphorus, nitrate and heavy metals and crude oil by-products from polluted wastewater: A comparative study. **Funded by NRF and TUT**

2007 -2013: Combined phenolic resin-silver nanoparticle filters: A cost-effective nanotechnology for the removal of pathogenic micro-organisms from groundwater sources and for the control of bacterial regrowth and inhibition of biofilm formation. **Funded by NRF and TUT**

2008- 2013: Breakthrough Analysis for water disinfection using Silver Nanoparticles Coated Resin Beads in Fixed-Bed Column. **Funded by NRF and TUT**

2008-2010 Development and implementation of a user-friendly guideline document for emergency disinfection of drinking water. **Funded by WRC**

2009-2010: Silver impregnated porous pot filter for the production of safe drinking water. Funded by WRC.

2009-2012: Design, evaluation of cost-effective household drinking water treatment systems and compilation of guidelines for the selection and use of home water treatment systems and devices. **Funded by WRC**

2010-2015: Impact of new developments on sanitation infrastructures and the state of South African water resources. **Funded TUT**

2011- 2013: Determination of the microbial ecology and chemical profile of the fermentation module during biological nutrient removal. **Funded by Johannesburg Water and University of Johannesburg**

2012 -2015: Impacts of zinc oxide and metallic silver nanoparticles on the microbial population in wastewater treatment systems. **Funded by WRC and C.S.I.R**

2012 -2016: Solar radiation – ozonation coupled system for disinfection and removal of organic and inorganic pollutants from drinking water using nanoparticles. **A joint research grant under the South African / Egypt research partnership programme bilateral agreement.**

2014-2017: Eradication of diarrhoeal diseases through implementation of cost-effective household water treatment systems in South African rural communities. **Funded by NRF and Department of Science & Technology (DST)**

2014 -2016: Predicted dynamics and associated risk of microbial pathogens in water resource sediments under varying climate scenarios of the year". The overall aim of project was to determine the impact of seasonal variations on the extent to which sediments were polluted with microbial pathogens, to characterise the remobilisation dynamics of these pathogens in water resource sediments in selected areas and ultimately to predict pathogen loads under different climatic conditions. A new approach, based on the volume of water displaced by the sediment (sediment volume), was developed. This was a joint project between the Council for Scientific & Industrial

Research (CSIR Pretoria) and my Research Unit. The project was financially supported by the WRC under the Leadership of CSIR.

2014-2015: Status of water sources, hygiene and sanitation and its impact on the health of households of South African rural communities. **Funded by NRF and DST**

2015 – 2017: Comparing the effectiveness of biological treatment of brines by halophilic and halotolerant bacteria under aerobic and anaerobic conditions in South Africa. **Funded by NRF and DST**

2015- 2017: Design and development of Silver nanoparticle filter systems in the removal of bacterial and protozoan pathogens from drinking water sources. **Funded by NRF and DST**

2015 -2021: South African mine-water microbiota with the potential for mine-water remediation. The project aimed to compare and analyse the complexity of the bacterial and eukaryotic community present in different mine water environments in South African mines in order to study their diversity and community structures and to establish their adaptive capacity to the high metal environment and remediation. **Funded by the NRF and DST.**

2017 – 2020: The multidimensional approach for characterization and tracking of antimicrobial resistance in terrestrial and aquatic environments of South African rural and urban areas. This project resulted in the elucidation of critical environmental reservoirs associated with the proliferation of antibiotic-resistant bacteria and antibiotic resistant genes in South African aquatic environments and in the development of a webtool for genome-based surveillance of AMR in the country **Funded by the NRF and DST.**

2017 - 2022: Novel bio-catalytic degradation of endocrine disrupting compounds in wastewater. The project resulted in the development of a cost-effective biocatalyst for removal of EDCs in wastewater. **Funded by NRF and DST**

2017 – current: Removal of antibiotic resistant bacteria and antibiotic resistance genes from soil and water using biosynthesized nanomaterials. **Funded by the NRF and DST**

2017 – Current: Integrated Water and Sanitation Safety Tool for the Management of Water Resource and Protection of Public Health. **Funded by the NRF and DST**

## **17.2 Research Collaborators**

### **a. International Collaborators:**

- INRA Narbonne/France (2002-current)
- The University of Illinois-/ Urbana-Champaign/USA (2003-current)
- Clark Atlanta University/USA (2003-current)
- Illinois Groundwater Survey/USA (2003-current)
- National Research Center -Water Pollution Control Department/ Egypt
- University of Trento/Italy
- Michigan University/ USA

### **b. National Collaborators**

- CSIR (1996-current)
- University of Pretoria(1993-current)
- University of Venda (1998-current)

- University of KwaZulu Natal (1998 –current)
- University of Johannesburg (2006-current)
- University of Limpopo (2019-current)
- University of South Africa (2017-current)
- Umgeni Water (1998-current)
- Chris Swartz Water Utilization Engineers (2004-2008)
- Faculty of Science, Faculty of Engineering and Faculty of Management Sciences at Tshwane University of Technology

### **18. Service to the community**

2003- March 2006: Chairperson of the St John HIV/AIDS Centre of Fort Beaufort  
 2002-current: Training of the operators involved in the treatment of drinking water in the Eastern Cape Province and Ugu District Municipality- in KwaZulu Natal Province, Limpopo province

Frank collaboration has been established between my research team and the rural communities of the Eastern Cape Province, Amatole Water Board, Umgeni Water and most of District Municipalities in the Eastern Cape, Western Cape, Mpumalanga, Limpopo, and KwaZulu Natal Provinces to control the transmission of waterborne diseases by domestic drinking water supplies.