

CV: Musa Manga

- 1. Name:** MUSA MANGA  
**2. Profession:** Researcher/ Water, Sanitation, and Environmental Engineer  
**3. Contact Address:** Department of Environmental Sciences and Engineering,  
 Gillings School of Global Public Health, University of North Carolina at Chapel Hill,  
 Rosenau Hall, 135 Dauer Drive, Chapel Hill, NC 27599-7431, North Carolina, USA
- 4. Email Address:** [mmanga@email.unc.edu](mailto:mmanga@email.unc.edu)  
**5. Skype:** musa.nsubuga.manga  
**6. Date:** May 2022

**7. Education**


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2020-	2022	<b>Carolina Faculty Diversity Postdoctoral Research Associate</b> , Department of Environmental Sciences and Engineering, University of North Carolina at Chapel Hill (UNC), USA
2017-	2020	Postdoctoral Research Associate, Department of Environmental Sciences and Engineering, The Water Institute, University of North Carolina at Chapel Hill (UNC), USA
2013-	2017	Ph.D. in Civil Engineering ( <b>Majoring in Public Health Engineering</b> ), School of Civil Engineering, University of Leeds, UK
2010-	2011	Master of Engineering Science ( <b>Distinction</b> ) in Environmental Engineering and Project Management, University of Leeds, UK
2006-	2009	BSc (Hons) Construction Management ( <b>First Class Degree</b> ), Makerere University, Kampala, Uganda
2001-	2003	Ordinary National Diploma in Architectural Design and Draughtsmanship ( <b>Credit Diploma</b> ), Uganda Technical College, Uganda

**8. Employment History**

- From 2022 – To date  
 Employer: *Department of Environmental Sciences and Engineering, Gillings School of Global Public Health, University of North Carolina at Chapel Hill.*  
 Position Held: Assistant Professor Tenure-Track
- From 2020 – 2022  
 Employer: *Department of Environmental Sciences and Engineering, Gillings School of Global Public Health, University of North Carolina at Chapel Hill.*  
 Position Held: Carolina Faculty Diversity Post-Doctoral Research Associate
- From 2017 – 2020  
 Employer: *[The WATER INSTITUTE at UNC](#), Department of Environmental Sciences and Engineering, Gillings School of Global Public Health, University of North Carolina at Chapel Hill.*  
 Position Held: Post-Doctoral Research Associate
- From 2018 – To date  
 Employer: *Department of Construction Economics and Management, School of the Built Environment, (College of Engineering, Design Art & Technology) Makerere University.*  
 Position Held: **Adjunct** Lecturer in Sanitation and Environmental Engineering

- From 2013 – 2017  
 Employer: *Institute of Public Health and Environmental Engineering (iPHEE), School of Civil Engineering, University of Leeds, Leeds, United Kingdom*  
 Position Held: Doctoral Researcher. Advisor: - Professor Barbara Evans
- From 2012 – 2018  
 Employer: *Department of Construction Economics and Management, School of the Built Environment, (College of Engineering, Design Art & Technology) Makerere University.*  
 Position Held: Lecturer in Sanitation and Environmental Engineering
- From 2012 – 2017  
 Employer: *Air Water Earth (AWE) Ltd, Civil and Environmental Engineering Consultants*  
 Position Held: Water, Sanitation, and Environmental Engineer
- From 2010 – 2012  
 Employer: *Institute of Public Health and Environmental Engineering (iPHEE), School of Civil Engineering, University of Leeds, Leeds, United Kingdom*  
 Position Held: Research Assistant
- From 2007 to 2011  
 Employer: *M&E Associates Ltd, Consulting Engineers*  
 Position Held: Assistant Sanitation and Environmental Engineer
- From 2005 to 2007  
 Employer: *Petrocity (U) Enterprise Ltd*  
 Position Held: Technical/ Construction Manager
- From 2003- 2004  
 Employer: *Gepoka Associates Ltd, Architects & Consulting Engineers*  
 Position Held: Architectural Assistant

## 9. Honors and Awards

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- 2020 – 2022: Carolina Postdoctoral Program for Faculty Diversity Fellowship (CPPFD) from University of North Carolina at Chapel Hill for Carolina Postdoctoral Research Associate in the Department of Environmental Sciences and Engineering, Gillings School of Global Public Health, UNC.
- 2015 – 2016: Leeds International Research Scholarship (LIRS) from University of Leeds for Doctorial (Ph.D.) studies in Civil Engineering, University of Leeds, UK. **Round 3**
- 2014 – 2015: Leeds International Research Scholarship (LIRS) from University of Leeds for Doctorial (Ph.D.) studies in Civil Engineering, University of Leeds, UK. **Round 2**
- 2013 – 2014: Leeds International Research Scholarship (LIRS) from University of Leeds for Doctorial (Ph.D.) studies in Civil Engineering, University of Leeds, UK. **Round 1**
- 2011: Prize of Best Student (1/23), MSc (Eng) Environmental Engineering and Project Management (2010 – 2011), School of Civil Engineering, University of Leeds, UK.
- 2010 - 2011: AGA KHAN FOUNDATION International Scholarship for MSc. Environmental Engineering and Project Management at the University of Leeds, UK.

- 2001-2003: National Scholarship from the Government of Uganda for the ordinary diploma in Architectural Design and Draughtsmanship.
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## **10. Membership in Professional Societies**

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2013 – Present: NEMA- Registered & Certified Environmental Impact Assessment (EIA) Practitioner

2013 – Present: Member, Uganda Association of Impact Assessment Practitioners (UAIA)

2012 – Present: Member, Chartered Institution of Water and Environmental Management (CIWEM).

## **11. Bibliography**

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### **11.A. Published Books, Book Chapters, and Edited Volumes**

#### **11.A1 Books**

No Data

#### **11.A2. Refereed Book Chapters and Edited Volumes**

No Data

#### **11.A3. Unpublished Books**

2. **Manga, M.**, 2011. Assessment of Lifecycle Costs for Low-cost Sanitation Technologies in the Informal Settlement areas of Soweto (Johannesburg): Focusing on Simplified Sewerage System. MSc. Environmental Engineering and Project Management thesis, University of Leeds, United Kingdom.
1. **Manga, M.**, 2009. Investigation of the Most Appropriate Concrete Mix Design Method for the Local Construction Materials in Kampala. BSc. Dissertation, Faculty of Technology (College of Engineering Design Art and Technology), Makerere University, Uganda.

### **11.B. Refereed Publications and Submitted Articles**

#### **11.B1. Refereed Papers/ Articles – In Review**

4. \*Sprouse, L, Tidwell, J.B, **Manga, M.** \*\*, (Manuscript under preparation). *Factors associated with unsafe child feces disposal practices in the Asia-Pacific region: A systematic review*. To be submitted to the International Journal of Hygiene and Environmental Health.
3. Capone, D., Barker, T., Cumming, OI., Flemister, A., Geason, R., Kim, E., Knee, J., Linden, Y., **Manga, M.**, Meldrum, M., Nala, R., Smith, S., Brown, J., A mass balance approach using *Ascaris* spp. ova to model the localized transport of feces and fecal sludges to soils. ACS Environmental Au.
2. **Manga, M.**, Camargo-Valero, M.A., and Evans, B.E. Recycling of faecal sludge: Nitrogen, carbon and organic matter transformation during Co-Composting of faecal sludge with different bulking agents. Journal of Environmental Management.

1. **Manga, M.**, Acheng, P., Inactivation of Faecal Pathogens During faecal Sludge Composting: A systematic Review. *Environmental Technology Reviews*.

#### 11.B2. Refereed Papers/ Articles – Published (\*\*Indicates Senior Author; \* Indicates Advisee)

13. **Manga, M.**, Kolsky, P., Rosenboom, J.W., Ramalingam, S., Sriramajayam, L., Bartram, J., and Stewart, J. 2022. Public health performance of sanitation technologies in Tamil Nadu, India: Initial perspectives based on E. coli release. *International Journal of Hygiene and Environmental Health*. 243, p113987. <https://doi.org/10.1016/j.ijheh.2022.113987>
12. \*Acheng, P.O.Kibwami, N.Mukasa, T.J.Odongkara, B.B.Birungi, R.Semanda, J. and **Manga, M\*\***. 2022. Building information modelling adoption in Uganda's construction industry. *International Journal of Construction Management*. pp.1-24. <https://doi.org/10.1080/15623599.2022.2047278>
11. **Manga, M.**, Okeny, L.O., Ngobi, T.G., Pamela, A.O., Namakula, H., Kyaterekera, E., Nansubuga, I., and Kibwami, N., (2021). Impacts of storage tanks under the indirect cold water supply system on household water quality: a case of Wakiso District, Uganda. *Water Supply*. 22(3), pp.3072-3085. <https://doi.org/10.2166/ws.2021.411>
10. \*Beardsley R, Cronk R., Tracy W., Fleming L., Ng'ambi M., Tidwell, J.B, **Manga, M\*\***, (2021) Factors associated with safe child feces disposal: evidence across Ethiopia, India, and Zambia. *International Journal of Hygiene and Environmental Health*, 237, pp. 113832. <https://doi.org/10.1016/j.ijheh.2021.113832>.
9. **Manga, M.**, Camargo-Valero, M.A., Anthonj, C., and Evans, B.E. 2021. Fate of faecal pathogen indicators during faecal sludge composting with different bulking agents in tropical climate. *International Journal of Hygiene and Environmental Health*. 232, p113670.
8. **Manga, M.**, Ngobi, T.G., Okeny, L., Acheng, P., Namakula, H., Kyaterekera, E., Nansubuga, I. and Kibwami, N., (2021). The effect of household storage tanks/vessels and user practices on the quality of water: a systematic review of literature. *Environmental Systems Research*, 10(1), pp.1-26.
7. \*Wesonga, R., Kasedde, H., Kibwami, N. and **Manga, M\*\***, 2021. A Comparative Analysis of Thermal Performance, Annual Energy Use, and Life Cycle Costs of Low-cost Houses Made with Mud Bricks and Earthbag Wall Systems in Sub-Saharan Africa. *Energy and Built Environment*. <https://doi.org/10.1016/j.enbenv.2021.06.001>
6. Kibwami, N., Wesonga, R., **Manga, M.** and Mukasa, T., 2021. Strategies for Improving Quantity Surveyors' Education Training in Uganda. *International Education Studies*, 14(2), pp.33-43.
5. Anthonj, C., Setty, K.S., Ezbakhe, F., **Manga, M.**, Hoeser, C. 2020. A systematic review of water, sanitation, hygiene and environmental health among Roma communities in Europe: Situation analysis, cultural context, and obstacles to improvement. *International Journal of Hygiene and Environmental Health*. 226. <https://doi.org/10.1016/j.ijheh.2020.113506>
4. **Manga, M.**, J. Bartram, Evans, B., 2020. *Economic Cost Analysis of Low-Cost Sanitation Technology Options in Informal Settlement areas (Case Study: Soweto, Johannesburg)*. *International Journal of Hygiene and Environmental Health*. 223 (1) pp. 289-298. <https://doi.org/10.1016/j.ijheh.2019.06.012>.
3. **Manga, M.**, Evans B., Camargo-Valero, M. A., 2019. Inactivation of Viable *Ascaris* eggs during Fecal Sludge Co-composting with Chicken Feathers and Market waste. *Desalination and Water Treatment*. 163 (2019), pp.347-357. doi: 10.5004/dwt.2019.24494.

1. Fleming, L., Anthonj, C., Thakkar, M.B., Tikoisuva, W.M., **Manga, M.**, Howard, G., Shields, K.F., Kelly, E., Overmars, M., and Bartram, J., 2019. Urban and rural sanitation in the Solomon Islands: How resilient are these to extreme weather events? *Science of The Total Environment*. 683, pp.331-340. <https://doi.org/10.1016/j.scitotenv.2019.05.253>
1. **Manga, M.**, Evans B., Camargo-Valero, M. A., Horan, N., 2016. *Effect of filter media thickness on the performance of sand drying beds used for fecal sludge management*. *Water Science and Technology Journal- IWA publishing*. 74(12) pp. 2795-2806. <https://doi.org/10.2166/wst.2016.451>

### 11.B3. Refereed Conference Papers/ Articles – Published

2. **Manga, M.**, Evans B., Camargo-Valero, M. A., Horan, N., 2016. Nitrogen evolution during co-composting of fecal sludge with chicken feathers. In the 13<sup>th</sup> IWA Specialized Conference on Small Water and Wastewater Systems (SWWS) and the 5<sup>th</sup> IWA Specialised Conference on Resources-Oriented Sanitation (ROS) 14 – 16<sup>th</sup> September 2016, Athens, Greece.  
Online:[http://uest.ntua.gr/swws/proceedings/pdf/SWWS2016\\_Manga\\_et\\_al\\_2016\\_Nitrogen\\_Manuscript.pdf](http://uest.ntua.gr/swws/proceedings/pdf/SWWS2016_Manga_et_al_2016_Nitrogen_Manuscript.pdf)
1. **Manga, M.**, Evans B., Camargo-Valero, M. A., Horan, N., 2016. The fate of Helminth eggs during the co-composting of faecal sludge with chicken feathers and market waste. In the 13<sup>th</sup> IWA Specialized Conference on Small Water and Wastewater Systems (SWWS) and 5<sup>th</sup> IWA Specialised Conference on Resources-Oriented Sanitation (ROS) 14 – 16<sup>th</sup> September 2016, Athens, Greece. Online:  
[http://uest.ntua.gr/swws/proceedings/pdf/SWWS2016\\_Manga\\_et\\_al\\_2016\\_Helminth\\_eggs\\_Manuscript\\_ORAL\\_PRESENTATION.pdf](http://uest.ntua.gr/swws/proceedings/pdf/SWWS2016_Manga_et_al_2016_Helminth_eggs_Manuscript_ORAL_PRESENTATION.pdf)

### 11.B4. Refereed Papers/ Articles/ Manuscripts – Under Preparation (\*\*Indicates Senior Author; \* Indicates Advisee)

5. **Manga, M.**, Evans B., Camargo-Valero, M. A., Horan, N., (Manuscript under preparation). *Occurrence, growth, and suppression of pathogens during the co-composting of faecal sludge with different organic waste types*. To be submitted to the *International Journal of Waste Management*.
4. **Manga, M.**, Evans B., Camargo-Valero, M. A., Horan, N., (Manuscript under preparation). *Chemical and biological changes during co-composting of dewatered faecal sludge with different organic wastes, and evaluation of compost maturity*. Targeting the *Journal of Science of the Total Environment: An International Journal*.
3. **Manga, M.**, Evans B., Camargo-Valero, M. A., Horan, N., (Manuscript under preparation). *Effect of turning frequency on the survival of faecal indicator microorganisms during aerobic composting of faecal sludge with sawdust*. Targeting *The Environmental Science and Technology Journal: An International Journal*.
2. **Manga, M.**, Evans B., Camargo-Valero, M. A., Horan, N., (Manuscript under preparation). *Recycling of faecal sludge: Nitrogen, carbon, and organic matter transformation during Co-Composting of faecal sludge with different organic solid waste*. Targeting the *Journal of Agriculture, Ecosystems, and Environmental: An International Journal*.

### 11.C. Presentations and Published Abstracts

#### 11.C1. Keynote Addresses and Plenary Discussions

2. **Manga, M.**, Mbegeure, M., Muximpua O. D., Bateganya, N., 2021. Financing sanitation improvement in low income communities; some experiences, challenges and opportunities. The 8<sup>th</sup>

Africa Water Week (AWW8) and the 6<sup>th</sup> AfricaSan Conference. African Water and Sanitation (AFSA) Week 2021, 22<sup>nd</sup> – 26<sup>th</sup> November 2021. The Council of African Ministers Responsible for Water (AMCOW) and the African Union Commission.  
<https://africawatersanitationweek.pathable.eu/meetings/virtual/2WLoupM84pNjTA4tq>

1. **Manga, M.**, Berendes, D., and Lukooya B. N., 2019 Protecting the Urban Environment from Fecal Contamination. Webinar on the WaSH Policy Research Digest Issue#13. Invited 18 November 2019.

### 11.C2. Invited Conference and Workshop Presentations

6. **Manga, M.**, 2020. Lifecycle costs and population density as key considerations for sanitation technology selection – Evidence from Soweto. In the World Water Week at home 2020, 25<sup>th</sup> August 2020, SIWI. The theme “Sewers for Resilient Sanitation in the 21st Century”.  
<https://www.worldwaterweek.org/event/9131-sewers-for-resilient-sanitation-in-the-21st-century>.
5. **Manga, M.**, B. Evans, Bartram, J., Kolsky, P., Stewart, J., 2019. Septic tanks are not septic tanks in Tamil Nadul, India. The 2019 Bill & Melinda Gates Foundation, WaSH MEDS convening 27<sup>th</sup> October – 1<sup>st</sup> November 2019, Siem Reap, Cambodia.
4. **Manga, M.**, Stewart, J., Medina, B., Andy, P., Bartram, J., Kolsky, P., 2018. *The flow and fate of sanitation related pathogens in the environment*. The 2018 Bill & Melinda Gates Foundation, WaSH MEDS convening 23<sup>rd</sup> September – 28<sup>th</sup> October 2018, Dakar, Senegal.
3. **Manga, M.**, Stewart, J., Medina, B., Andy, P., Bartram, J., Kolsky, P., 2017. The proof of concept of estimates of the unsafe return of human excreta to the environment. The 2017 Bill & Melinda Gates Foundation, WaSH MEDS convening 5<sup>th</sup> – 10<sup>th</sup> November 2017, Patna, Bihar, India.
2. Mitchell, C., Kolsky, P., Boisson, S., Evans, B., Moe, C., Medlicott, K., **Manga, M.**, Hawkins, P., Willetts, J., Kome, A., Norman, G., 2017. *Pathogen flows: Applying public health principles to urban sanitation*. In the World Water Week 2017, 27<sup>th</sup> August – 2<sup>nd</sup> September 2017, SIWI, Stockholm, Sweden. The theme “Water and Waste: Reduce and Reuse”.  
<https://programme.worldwaterweek.org/Event/6652-pathogen-flows-applying-public-health-principles-to-urban-sanitation>
1. **Manga, M.**, Beltran, E., Zambesi, L., and Evans, B. 2011. *Financial assessment tool for urban sanitation in Soweto, Johannesburg*. Presented at the 8<sup>th</sup> Community of Sanitation Practice Meeting, 16<sup>th</sup> May 2011, Leeds, UK. Meeting theme “Urban Sanitation Planning: how to think about Scale from the Start”.

### 11.C3. Conference and Workshop Presentations

14. **Manga, M.**, Kolsky, P., Stewart, J., 2021. *How well do sanitation technologies intercept release of pathogens to the environment? Evidence from Tamil Nadu, India*. The UNC Water and Health: Where Science Meets Policy 2021, 4 - 8<sup>th</sup> October 2021, The Water Institute at University of North Carolina, Chapel Hill, North Carolina, USA. The Side Event theme “Understanding pathogen flows associated with the sanitation practices in the urban communities”.
13. **Manga, M.**, Kolsky, P., Ramalingam, S., Sriramajayam, L., Wankhade, K., Bartram, J., Stewart, J., (2021). *Physical and microbiological comparison of sanitation technologies in Tamil Nadu, India*. In the Sixth International Faecal Sludge Management (FSM6 Virtual) Conference 2021 Proceedings, 31<sup>st</sup> May – 4<sup>th</sup> June 2021, Faecal Sludge Management Alliance, Jakarta, Indonesia. The theme “Health, Safety and Hygiene”.

12. **Manga, M.**, Bartram, J., Kolsky, P., Stewart, J., 2020. *Materialization of the pathogen release concept - application of field data on sanitation technologies in India*. The UNC Water and Health: Where Science Meets Policy 2020, 26<sup>th</sup> -28<sup>th</sup> October 2020, The Water Institute at University of North Carolina, Chapel Hill, North Carolina, USA. The theme "Sanitation".
11. **Manga, M.**, Bartram, J., Kolsky, P., Stewart, J., 2019. *Unveiling pathogen hazards associated with sanitation technologies in Tamil Nadu*. The UNC Water and Health: Where Science Meets Policy 2019, 7<sup>th</sup> -11<sup>th</sup> October 2019, The Water Institute at University of North Carolina, Chapel Hill, North Carolina, USA. The theme "Fecal Contamination".
10. **Manga, M.**, Camargo-Valero, M. A., Evans B., 2019. Fate of viable *Ascaris* eggs during fecal sludge co-composting with chicken feathers and market waste. The UNC Water Microbiology 2019, 14<sup>th</sup> – 16<sup>th</sup> May 2019, The Water Institute at University of North Carolina, Chapel Hill, North Carolina, USA. The theme "Management & Treatment".
9. Kyaterekera, E., **Manga, M.**, 2019. *Influence of bulking agent on the inactivation efficiency of Ascaris eggs*. The UNC Water Microbiology 2019, 14<sup>th</sup> – 16<sup>th</sup> May 2019, The Water Institute at University of North Carolina, Chapel Hill, North Carolina, USA. The theme "Management & Treatment".
8. **Manga, M.**, Stewart, J., Bartram, J., Kolsky, P., 2018. *Estimates of unsafe return of human excreta to the environment*. The UNC Water and Health: Where Science Meets Policy 2018, 29<sup>th</sup> October - 2<sup>nd</sup> November 2018, The Water Institute at University of North Carolina, Chapel Hill, North Carolina, USA. The Side Event theme "Understanding the flow and fate of sanitation related pathogens".
7. Kolsky, P., **Manga, M.**, Stewart, J., Bartram, J., 2017. *Potential of pathogen hazard tracking for sanitation planning*. The UNC Water and Health: Where Science Meets Policy 2017, 16<sup>th</sup> 20<sup>th</sup> October 2017, The Water Institute at University of North Carolina, Chapel Hill, North Carolina, USA.
6. **Manga, M.**, Camargo-Valero, M. A., Evans B., 2017. *Can bulking agent types influence Ascaris eggs inactivation efficiency during faecal sludge treatment via co-composting?* The UNC Water and Health: Where Science Meets Policy 2018, 16<sup>th</sup> – 20<sup>th</sup> October 2017, The Water Institute at University of North Carolina, Chapel Hill, North Carolina, USA. The theme "Treatment".
5. **Manga, M.**, Evans B., Camargo-Valero, M. A., Horan, N., 2016. *Helminth eggs inactivation during Co-composting of faecal sludge with bulking agents*. In the 17<sup>th</sup> International Water Association, Young Water Professionals UK Annual Conference 2016 Proceedings, 30<sup>th</sup> March – 1<sup>st</sup> April 2016, Norwich, UK. The theme "People, Planet, Profit; thinking different for a sustainable water industry".
4. **Manga, M.**, Evans B., Camargo-Valero, M. A., Horan, N., 2016. *Enhancing pathogen inactivation using faecal sludge co-composting with chicken feathers*. Presented at WASH Futures Conference 2016, 16<sup>th</sup> – 20 May 2016, Brisbane, Australia. Conference theme "Pathways to universal and sustained water, sanitation, and hygiene".
3. **Manga, M.**, Evans B., Camargo-Valero, M. A., Horan, N., 2015. *Influence of filter media thickness on sand drying beds performance: nutrients and pathogen inactivation*. In: proceeding of the 5<sup>th</sup> PGR Conference, 9-10<sup>th</sup> September 2015, Leeds, United Kingdom.
2. **Manga, M.**, Evans B., Camargo-Valero, M. A., Horan, N., 2014. *Can co-composting be a viable way of inactivating pathogens and recovering nutrients from faecal sludge?* In the 15<sup>th</sup> Sanitation Community of practice (SanCop) event conference proceeding, 4<sup>th</sup> November 2014, Leeds, UK. Meeting theme "Fecal Sludge Management, Wastewater Treatment, and Reuse – SWOT Analysis of Technological Solutions". <https://www.susana.org/en/news-and-events/sanitation-events/past-event-pages/details/177>



1. **Manga, M.**, Evans B., Camargo-Valero, M. A., Horan, N., 2014. *Can co-composting be a feasible upscale method of treating fecal sludge in Urban Africa?* In: proceeding of the 4<sup>th</sup> PGR Conference, 9-10<sup>th</sup> September 2014, Leeds, United Kingdom.

#### 11.C4. Invited Seminar Presentations

7. **Manga, M.**, 2022, *Equity in Access to Sanitation: Sanitation Financing*. Department of Environmental Finance Center, UNC School of Government, University of North Carolina at Chapel Hill, Invited Guest Lecture/ talk, 28<sup>th</sup> February, 2022.
6. **Manga, M.**, 2021, *Pathogen releases associated with sanitation technologies in Tamil Nadu*. ENVR 40: In-house Seminar Series, Department of Environmental Science and Engineering, Gillings School of Global Public Health, University of North Carolina at Chapel Hill, Seminar 10<sup>th</sup> February, 2021.
5. **Manga, M.**, 2019, *Solid wastes in pit latrines: drivers and challenges of faecal sludge management in informal settlements*. Kampala City Council, Invited seminar, 22<sup>nd</sup> October 2019.
4. **Manga, M.**, 2019, *Public health hazards associated with sanitation technologies in Tamil Nadu, Indian*. Institute for Human Settlements (IHS), Chennai, India, Chennai, India, 10<sup>th</sup> September 2019,
3. **Manga, M.**, 2018, *Unsafe returns of human waste to the environment in Tamil, Nadu. The India WaSH team*, the Bill and Melinda Gates Foundation India, Taj Mansingh Hotel, Delhi, India, 1<sup>st</sup> August 2018.
2. **Manga, M.**, 2016, *Fate of pathogen indicators during co-composting of faecal sludge with organic waste*. The Water Institute Lunch Seminar, Department of Environmental Science and Engineering, Gillings School of Global Public Health, University of North Carolina at Chapel Hill, Invited Seminar, McGavran-Greenberg 2301, 2<sup>nd</sup> September 2016.
1. **Manga, M.**, 2014, *Treatment of faecal sludge in Urban Africa using sand drying beds: enhancing pollutants removal*. National Water and Sewerage Corporation (NWSC) and Ministry of Water and Environment, Kampala, Uganda. Invited Seminar, 16<sup>th</sup> March 2016.

## 12. Academic Responsibilities

### 12.A1. Teaching Record

Semester and Academic Year	Course Number	Course Title	Students
Fall 2021	ENVR 582	Sanitation for Development (Lead Instructor)	23
Fall 2020	ENVR 582	Sanitation for Development (Lead Instructor)	17
Semester II**, 2019/20	CIV 7125	Sanitation systems and services	36
Semester I*, 2019/20	CIV 7129	Sanitation technology I	39
Semester II**, 2018/19	CIV 7274	Sanitation technology II	37
Semester I*, 2018/19	CIV 7126	Sanitation and public health	35
Semester II**, 2017/18	TCW 6204	Advanced Water and Wastewater Treatment	30
Semester II**, 2017/18	CIV 7261	Solid waste management	38
Semester I*, 2017/18	CIV 7129	Sanitation technology I	39



Semester and Academic Year	Course Number	Course Title	Students
Semester I*, 2017/18	TCW 6102	Introduction to Environmental Impact Assessment	30
Semester II**, 2016/17	TCW 6204	Advanced Water and Wastewater Treatment	35
Semester II**, 2016/17	CIV 6204	Advanced environmental management and control	33
Semester I*, 2016/17	CIV 6101	Advanced Construction Technology I	15
Semester I*, 2016/17	CMG 8105	Principles of construction design	18
Semester II**, 2015/16	TEC 7200	Research methods	50
Semester II**, 2015/16	TCC 6202	Advanced Construction Technology II	26
Semester I*, 2015/16	TCC 6101	Advanced Construction Technology I	29
Semester I*, 2015/16	CIV 7102	Advance environmental studies	46
Semester II**, 2014/15	QUS 2202	Building Services	74
Semester II**, 2014/15	CE 4206	Environmental Quality Management	95
Semester I*, 2014/15	CE 4101	Environmental Engineering II	87
Semester I*, 2014/15	CMG 3101	Construction Technology III	60
Semester II**, 2013/14	QUS 2202	Building Services	70
Semester II**, 2013/14	CE 3203	Environmental Engineering I	109
Semester I*, 2013/14	CE 4101	Environmental Engineering II	92
Semester I*, 2013/14	CMG 3101	Construction Technology III	63
Semester II**, 2012/13	QUS 2202	Building Services	62
Semester II**, 2012/13	CE 3203	Environmental Engineering I	98
Semester I*, 2012/13	CE 4101	Environmental Engineering II	101
Semester I*, 2012/13	CMG 3101	Construction Technology III	50
Semester II**, 2011/12	QUS 2202	Building Services	68
Semester II**, 2011/12	CE 3203	Environmental Engineering I	96

\*Semester One (August to December) in Uganda is the same as Fall Semester in the USA

\*\*Semester Two (February to May) in Uganda is the same as Spring Semester in the USA

## **12.B. Individual Student Guidance**

### **12.B1. PhD Students**

**No Data**

**12.B2. MSc. Students****12.B2a. Graduated MS students (Selected)**

15.	Katharine Conaway (MS, 2022) - Title "Unsafe Release of Fecal Sludge and E. coli During Emptying and Transport". Department of Environmental Sciences and Engineering, University of North Carolina at Chapel Hill	2020-2022
14.	Beverly Medina (MS, 2019) - Title "The role of septic tanks in reducing the unsafe return of excreta to the environment: A targeted literature review and case study". Department of Environmental Sciences and Engineering, University of North Carolina at Chapel Hill	2017-2019
13.	Okeny Ojom Lawrence (MSc, 2019) – Title "Investigating the effect of water storage facilities onto the water quality". Makerere University	2018-2019
12.	Ngobi Timothy Gideon (MSc, 2019) – Title "Exploring the use of a web-based ICT system in reporting, recording, monitoring and managing occupational safety and health incidents in uganda's construction industry". Makerere University	2018-2019
11.	Kigenyi Asha (MSc 2018) – Title was "Assessment of the performance of sewerage disposal systems in Urban Areas- A case study of Kampala City Council." Makerere University	2018-2019
10.	Shakibu Sebutemba (MSc 2018) - Title "Investigating the feasibility of use of wastewater in concrete production". Makerere University	2017-2018
9.	Byekwaso Robert Ssengonzi MSc (non-thesis). Makerere University	2017-2018
8.	Nakabugo Esther MSc (no-thesis). Makerere University	2017-2018
7.	Tenywa Emmanuel, MSc. (non-thesis). Makerere University	2017-2018
6.	Nakisuyi Mary Immaculate, MSc. (non-thesis). Makerere University	2016-2017
5.	Miuro Duncan MSc (no-thesis). Makerere University	2016-2017
4.	Nannungi Sylvia MSc. (non-thesis). Makerere University	2016-2017
3.	Jonah Mugerwa MSc. (non-thesis). Makerere University	2016-2017
2.	Magaya paul MSc. (non-thesis). Makerere University	2015-2016
1.	Pauline Kavuma, MSc. (non-thesis). Makerere University	2015-2016

**12.B2b. In Process MSc. Students**

2021 – 2022 (Successfully defended her MSc on March 30, 2022): Katherine Conaway MSPH (thesis), University of North Carolina at Chapel Hill

**B3. Undergraduate Students****B2a. BSc. Students (Selected)**

10.	Rachel Beardsley (Undergraduate, 2020) - Title "Factors associated with safe child disposal: evidence across Ethiopia, India and Zambia". Department of Public Policy, University of North Carolina at Chapel Hill.	2019-2020
9.	Nakamoga Husnaa (BSc, 2019) - Title "Assessing the effects of construction and maintenance practices on water quality in indirect domestic water supply systems." Makerere University	2018-2019
8.	Baliddawa Angel Samuella (BSc, 2018) - Title "The assessment of the performance of Lubigi sewage treatment plant and its effect on receiving water streams." Makerere University.	2017-2018
7.	Mwebesa Nina Shatsi (BSc, 2018) Project title was "Investigating the economic viability of various locally available bulking agents on the performance of faecal sludge briquettes". Makerere University.	2017-2018

6.	Owino Shelah Ruth (BSc, 2018) - Title "Investigating the effectiveness of waste plastic as a binder in plastic-sand roofing tiles."	2017-2018
5.	Nassaka Swafiyah (BSc,2018) – Title "Determining accessibility to sanitation facilities in health centre III facilities in Kampala district."	2017-2018
4.	Baingana Allan (BSc, 2017) – Project Title was "The impact of greywater on the performance of a septic tank." Makerere University.	2016-2017
3.	Kavuma Andrew (BSc, 2016) – Title "An investigative study to assess the effectiveness of waste stabilisation ponds in Mbarara District". Makerere University.	2015-2016
2.	Namugenyi Patience (BSc, 2016) – Title "The effect of improper design of septic tanks on construction costs." Makerere University.	2015-2016
1.	Semakula Kato Issa (BSc, 2016) – Title "Investigative study to assess the effect of oily and soapy water on the biological processes in the septic tank". Makerere University	2015-2016

### B3. Other Mentoring Activities

#### 12.B4a. MPH Practicum students

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2021 – Lauren Sprouse, MPH, University of North Carolina at Chapel Hill: Role: - Preceptor

2021 – Anna Liles, MPH, University of North Carolina at Chapel Hill: Role: - Preceptor

2019 – Trey Kanumuambidi, MPH, University of North Carolina at Chapel Hill: Role: - Preceptor

#### 12.B4b. In Process MPH:- Practicum Students

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2022 – Present: Rachel Beardsley, MPH, University of North Carolina at Chapel Hill: Role: - Preceptor

2022 – Present: Amy Kryston, MPH, University of North Carolina at Chapel Hill: Role: - Preceptor

2022 – Present: Anna Verkuilen, MPH, University of North Carolina at Chapel Hill: Role: - Preceptor

2022 – Present: Cheryl Blevins, MPH, University of North Carolina at Chapel Hill: Role: - Preceptor

2022 – Present: Natalie Hairston, MPH, University of North Carolina at Chapel Hill: Role: - Faculty Advisor

2022 – Present: Madison Shaffer, MPH, University of North Carolina at Chapel Hill: Role: - Faculty Advisor

2022 – Present: Tiana Washington, MPH, University of North Carolina at Chapel Hill: Role: - Faculty Advisor

### 13. Grants and Contracts

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#### 13.A. As Principal Investigator/ Co-Principal Investigator

5. **Title of Project:** The Compendium: Consolidation of Evidence-Based Water and Sanitation Solutions in India

**Agency/ Company:** KPMG India

**Total Amount:** \$362,815

**Role:** Co-Principal Investigator

**Period of Contract:** 2022 - 2024

4. **Title of Project:** The effect of indirect water supply system on household water quality in Wakiso, Uganda.

**Agency/ Company:** Government of Uganda through Research and Innovation Fund

**Total Amount:** \$15,000

**Role:** Principal Investigator

3. **Title of Project:** Socially accepted evidence-based intervention strategies for reducing solid wastes in Pit latrines in Kampala - Uganda.  
**Agency/ Company:** Government of Uganda through Research and Innovation Fund  
**Total Amount:** \$30,000  
**Role:** Co-Principal Investigator

#### **13.B. As Lead Researcher – Contributing to proposal writing**

2. **Title of Project:** Phase II: Proof of Concept of Estimates of the Unsafe Return of Human Excreta to the Environment.  
**Agency/ Company:** Bill & Melinda Gates Foundation  
**Total Amount:** \$687,319  
**Role:** Lead Researcher  
**Period of Contract:** 2017 – 2022
1. **Title of Project:** The Collaborative Research and Knowledge Dissemination of the Condominal Sewage System  
**Agency/ Company:** The Inter-American Development Bank  
**Total Amount:** \$100,000  
**Role:** Lead Researcher  
**Period of Contract:** Anticipated to Start in 2022 (To follow-up with the funder)

#### **14. Professional Service**

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##### **14.A. Institute Contributions**

##### 14.A1. Institute Committee Service

2017	Chair for the committee that developed the curriculum of the new programme “MSc Construction Engineering and Management” at Ndejje University
2017 – Present	External reviewer of MSc thesis – Kyambogo University, Kampala, Uganda
2017 – Present	External reviewer of MSc thesis – Ndejje University, Kampala, Uganda
2017 – Present	External reviewer of MSc thesis – Makerere University, Kampala, Uganda

##### 14.A2. School Committee Service

2015 – 2017	Coordinator Research and Postgraduate programs at Ndejje University
2019	Chair – Special Examination Committee, Makerere University
2019	Member, MSc. Sanitation Engineering program development committee at Makerere University

##### **14.B. Professional and Honorary Society Memberships**

<b>2022 – Present</b>	Member, Rural Water Supply Network (RWSN)
<b>2020 – Present</b>	Member, The Sanitation Learning Hub: Sanitation and Hygiene for all means leaving no one behind
<b>2020 – Present</b>	Member, Faecal Sludge Management Alliance, Safely Managed Faecal Sludge for All

**2017 – Present** Member, Measurement, Evidence, Dissemination (MEDS) convening team, Bill & Melinda Gates Foundation

**2013 – Present** Member, Uganda Association of Environmental Impact Assessment Practitioners

**2011 – Present** Member, Sustainable Sanitation Alliance (SUSANA)**2011 – Present** Member, Sanitation Community of practice (SanCop)

#### **14.C. Invited Reviewer for Scientific Journals**

13. Water, Sanitation, and Hygiene for Development (WASH Dev)
12. International Journal of Hygiene and Environmental Health
11. Water Science and Technology
10. International Journal of Hygiene and Environmental Health
9. International Journal of Environmental Research and Public Health
8. Environmental Technology and Innovation
7. Desalination and Water Treatment
6. Research and Reports in Tropical Medicine
5. Environmental Technology and Innovation
4. Environmental Health Insights
3. Environmental Systems Research
2. Waste Management
1. Environmental Science and Pollution Research

#### **14.D. Invited Reviewer for International Grant Proposals**

3. February 2022- Bill & Melinda Gates Foundation – MEDS (BMGF), WaSH Proposals for LMIC Researchers, **Funder:** Bill & Melinda Gates Foundation
2. December 2018- Bill & Melinda Gates Foundation - Grand Challenges Explorations - Round 22, WaSH Proposals <https://gcgh.grandchallenges.org/article/grand-challenges-explorations-round-22-grants-awarded> **Funder:** Bill & Melinda Gates Foundation
1. December 2019- Lifecycle Cost Analysis of Green Affordable Housing Vs Conventional Housing. **Funder:** University of Rwanda Director of Research and Innovation

#### **14.E. Conference Organizing**

6. 2021 - Reviewed and scored selected abstracts submitted to 2021 Water and Health conference “Where Science Meets Policy” sponsored by The Water Institute at University of North Carolina, Chapel Hill, North Carolina, USA.
5. 2020 - Reviewed and scored selected abstracts submitted to 2020 Water and Health conference “Where Science Meets Policy” sponsored by The Water Institute at University of North Carolina, Chapel Hill, North Carolina, USA.
4. 2019 - Reviewed and scored selected abstracts submitted to 2019 Water and Health conference “Where Science Meets Policy” sponsored by The Water Institute at University of North Carolina, Chapel Hill, North Carolina, USA.
3. 2018 - Reviewed and scored selected abstracts submitted to 2018 Water Microbiology conference sponsored by The Water Institute at University of North Carolina, Chapel Hill, North Carolina, USA.
2. 2018 - Reviewed and scored selected abstracts submitted to 2018 Water and Health conference “Where Science Meets Policy” sponsored by The Water Institute at University of North Carolina, Chapel Hill, North Carolina, USA.

1. 2017 - Reviewed and scored selected abstracts submitted to 2017 Water and Health conference "Where Science Meets Policy" sponsored by The Water Institute at University of North Carolina, Chapel Hill, North Carolina, USA.

### **15. Selected Professional Practice- Past Assignments**

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Name of assignment:	<i>Design of sewage collection network, sewage treatment plant, and water supply system for Karoli Lwanga Hospital Nyakibale (Rukungiri, Uganda)</i>
Year:	2014 - 2015
Client:	Hospital Nyakibale (Rukungiri, Uganda)
Main project features:	The assignment involved the design of an intra-estate water supply pipe network, sewerage system, and wastewater treatment facility. Stabilization ponds were designed and evaluated against a package treatment plant for cost and technical feasibility.
Position held:	<b>Team Leader/ Sanitation and Environmental engineer</b>
Activities performed:	Design of stabilization ponds, sewage collection network, and water supply system. Participated in the technical and economic evaluation of lagoons against a package plant to advise on the best (technically and financially) sewage management option.
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Name of assignment:	<i>Preliminary Technical Evaluation of Masindi and Hoima National Water and Sewerage Corporation (NWSC) Sewerage Treatment Plants</i>
Year:	2012 – 2013
Location:	Hoima and Masindi District
Client:	Tullow Uganda Operations PTY Ltd
Main project features:	The assignment involved undertaking a preliminary technical evaluation of Masindi and Hoima NWSC Sewerage Treatment Plants before deciding to use them for treatment and disposal of Tullow Uganda Operations PTY Ltd sewage.
Position held:	<b>Team Leader/ Sanitation and Environmental Engineer</b>
Activities performed:	Preparation of As-built drawings, Wastewater sampling and analysis, design review (process capability and hydraulic capacity to handle the anticipated additional sewage), and preparation of design reports.
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Name of assignment:	<i>ESIA and RAP Studies for Proposed Muzizi Hydropower Project.</i>
Year:	2012 – 2013
Location:	Kyenjojo District, Kibaale District
Client:	Uganda Electricity Generation Company Limited
Main project features:	Muzizi HPP dam will be constructed across River Muzizi with one part in Kyenjojo District and another in Kibaale District; the dam will have a height of about 7 meters, and length of 60 meters. Muzizi HPP will impound a reservoir ± 155,000 m <sup>3</sup> in volume with a gross head of approximately 455m, a tailrace canal of about 160m, and installed capacity of 40-60 MW.
Position held:	<b>Water, Sanitation, and Environmental Engineer</b>
Activities performed:	Managed the ESIS and RAP studies both fieldwork and report development and its quality assurance. The ESIS and RAP study involved several specialists. Led water

quality measurement and analysis; soil quality sampling, profiling, and analysis; air quality measurements, noise, and vibration measurements impact identification and assessment and preparation of the ESIS. Analyzed impacts associated with power station operation.

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*Name of assignment:* *Environmental Audit of Kampala Capital City Authority (KCCA) Landfill at Kiteezi.*

*Year:* 2013

*Location:* Kampala District, Uganda

*Client:* *Kampala Capital City Authority (KCCA)*

*Main project features:* The assignment involved description of the current physical, biological and socio-cultural conditions for Mpererwe landfill; review of previous Environmental Impact Assessments for the landfill; assessment of landfill compliance with: (i) National Environment Management Authority (NEMA) approval conditions and or applicable national standards and regulations; (ii) International Development Agency (IDA) safeguard policies, especially recommendations of the Environmental Impact Assessment (EIA) and mitigation measures in the Environmental & Social Management Plan (ESMP) as well as the World Bank Group Environmental Health & Safety (EHS) guidelines; and (iii) international good practice; assessment of the capacity of the landfill operator in effectively complying with environmental and social requirements for operating the landfill and capacity of KCCA to ensure landfill activities comply with environmental and social requirements; and development of an Environmental Compliance Improvement Plan for Mpererwe Sanitary landfill.

*Position held:* **Water, Sanitation, and Environmental Engineer**

*Activities performed:* Participated in the environmental and social baseline surveys, stakeholder consultations, assessment of environmental and social impacts, development of mitigation measures, development of environment compliance Improvement plan and compilation of the final ESIA report.

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*Name of assignment:* *Resettlement Policy Framework and Environmental and Social Management Framework for Kampala Institutional & Infrastructure Development Project (KIIDP).*

*Year:* 2013

*Location:* Kampala District

*Client:* Kampala Capital City Authority (KCCA)

*Main project features:* The assignment involved development of a Resettlement Policy Framework (RPF) and Environmental and Social Management Framework (ESMF) for the proposed project components under KIIDP II to be implemented by KCCA.

*Position held:* **Water, Sanitation, and Environmental Engineer**

*Activities performed:* Coordinated project activities, participated in project disclosure and stakeholder consultation, socio-environmental impact analyses, report development.

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*Name of assignment:* *Design and Construction of Kampala Integrated Environment Management Project (KIEMP)*

*Year:* 2008 - 2010

*Location:* Kampala

*Client:* Kampala City Council Local Government



Main project features: It involved construction of 32 No. water stand posts, 35 No, VIP Toilets, Laying 3Km water mains, 13000 square meters of Drainage channels, and 2km of paved asphalt access roads.

**Position held: Assistant Sanitation and Environmental Engineer**

Activities performed: Prepared construction drawings, Construction Supervision, Quantification, and Certification of completed works.

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Name of assignment: *Design review of Tororo Railways Gravity Flow Scheme*

Year: 2009 - 2010

Location: Tororo District

Client: Directorate of Water Development (DWD), Ministry of Water and Environment.

Main project features: Technical designs involved the design of a river intake, water treatment plant with a capacity of 1170m<sup>3</sup>/day, 49Km of the pipeline, storage facilities, and Sanitation systems.

Position held: **Assistant Sanitation and Environmental Engineer**

Activities performed: Participated in preparation of designs, tender documents, drawings, and site supervision.

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Name of assignment: *Design Review of Mayuge Town Water Supply System*

Year: 2010

Location: Mayuge

Client: Directorate of Water Development (DWD), Ministry of Water and Environment.

Main project features: Prepared a detailed design that involved 2.2Km pumping main, 16Km transmission main, and 14.5Km distribution pipework, storage reservoirs, pumping station.

Position held: **Assistant Sanitation and Environmental Engineer**

Activities performed: Construction Supervision, Quantification, and Certification of completed works,

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Name of assignment: *Feasibility Studies, Detailed Designs and Construction Supervision of Butaleja-Busolwe, Tirinyi-Kibuku, Pallisa Town, Katovu, and Lukaya Water Supply Systems*

Year: 2009 - 2010

Location: Butaleja, Paliisa and Masaka Districts

Client: Directorate of Water Development (DWD), Ministry of Water and Environment.

Main project features: It involved the construction of 2km of paved asphalt access roads, 13000 square metres of Drainage channels, 32 No. water stand posts, 35 No, VIP Toilets and Laying 3Km water mains.

Position held: **Assistant Sanitation and Environmental Engineer**

Activities performed: Participated in preparation of designs, tender documents, drawings, and site supervision.

**Other Information can be supplied on request**