

CURRICULUM VITAE

1. **Family name:** Dirwai
2. **First names:** Tinashe Lindel
3. **Nationality:** Zimbabwe
4. **Country of Residence:** South Africa
5. **Contact details:** Cell: +27 74 130 9845; Email: DirwaiTL@ufs.ac.za or tldirwai@gmail.com
ORCID: <https://orcid.org/0000-0002-2617-7002>; ResearchGate: <https://www.researchgate.net/profile/Tinashe-Lindel-Dirwai>; Google Scholar: <https://scholar.google.co.za/citations?user=9wWF3rcAAAAJ&hl=en&oi=ao>

6. Education:

Institution [Date from - Date to]	Qualification obtained:
University of KwaZulu-Natal (2019 – 2021)	PhD Agricultural Engineering
University of KwaZulu-Natal (2016 – 2018)	MSc Agricultural Engineering
University of Zimbabwe (2010 – 2014)	BSc.Hons. Agricultural Engineering

7. Language skills: (1 - excellent; 5 - basic)

Language	Reading	Speaking	Writing
English	1	1	1
Shona	1	1	1

8. Membership of professional bodies:

Engineering Council of South Africa (ECSA) South African Institute of Agricultural Engineering (SAIAE)

9. **Specialisation** (e.g. Agronomy, soil fertility, agricultural economics, veterinary science etc.)
Irrigation and water resources management
10. **Present position:** Lecturer

11. Key Skills:

- Irrigation and Drainage Engineering
- Basic Python Programming
- Agricultural Water Management

- Application of Drone (UAVs) Technology to Agricultural Systems
- Water Governance
- Natural Resource Management (NRM) and Sustainable Livelihoods
- Climate change adaptation and mitigation and Climate-Smart Agriculture (CSA)
- Research and data collection, statistical data analysis (including systematic review and meta-analysis)
- Scientific writing, and editing and proposal development
- Developing policy briefs and strategic documents and advising government and regional bodies
- Project management and strategic planning
- Presenting (conferences, workshops, etc.) and public speaking

12. Specific experience:

Country	Date from - Date to
South Africa	2016 to date

13. Professional experience (Formal employment and Assignments/consultancies)

Date from - to	Location	Organisation	Position	Description of Duties and achievements
05/2021 to date	Free State Province South Africa	University of the Free State	Lecturer	Employed as an Irrigation specialist by the University of the Free State. I teach third year and honours students' courses on flood, moving systems and sub-surface irrigation technologies. I also teach an introductory course to Agricultural Engineering
07/2021 – 12/2021	Nairobi and Gaborone	Africa Union	Consultant	Co-authored the Africa's Draft Climate Change Strategy
07/2021 – 12/2021	Nairobi and Gaborone	Africa Union	Consultant	Facilitator and rapporteur: Consultative Meeting for the Southern and Eastern Africa Sub-Regions on the African Union Climate Change Strategy Document
01/2017 – 05/2021	KwaZulu-Natal Province South Africa	University of KwaZulu-Natal	Teaching Assistant	The modules handled were: (1) Technical communication skills (1st year)

Date from - to	Location	Organisation	Position	Description of Duties and achievements
				<p>Assisting students to develop academic and scientific writing skills. Supervised project designs, testing, evaluating, and project report compilation. Assisted students in developing PowerPoint presentations. Other activities involved assessing and designing marking criteria for the oral presentations and the designed prototypes.</p> <p>(2) Engineering drawing and design (1st year)</p> <p>Introducing students to fundamentals and principles of engineering working drawings. Assisting students with AUTOCAD. The module involved acquainting students to traditional engineering drawing techniques (board and pencil) before moving to tech assisted drawing (AUTO CAD). My other activities involved marking and grading weekly tutorial, tests and final examinations.</p> <p>(3) Soil and Water Conservation Engineering (4th year)</p> <p>Assisting students to appreciate and understand the fundamental concepts of soil and water conservation (SWC) engineering. Organised field trips to improve students' appreciation of SWC structures. Marked and graded continuous assessment exercises.</p>

Date from - to	Location	Organisation	Position	Description of Duties and achievements
01/2018 – 12/2021	KwaZulu-Natal Province South Africa	Center for Transformative Agriculture and Food Systems in Collaboration with UMgungundlovu District Municipality	Irrigation Specialist	Recruited to perform irrigation planning and design for small-scale farms. The duties extended to offering extension services through educating small-scale rural farming communities integrate climate change resilient crops with high water use efficiency irrigation techniques, crop production diversification to ensure food security, designing sustainable water efficient and climate-smart irrigation systems, offering ecological and engineering infrastructure solutions and offering policy recommendations for up-scaling and replication. Project sites are Swayemani and Nhlazuka.
01/2017 – 12/2017	KwaZulu-Natal Province South Africa	GHET – Ground Water Scientists	Engineering intern	Duties included: Ground water siting, Monitoring borehole drilling exercises and, Aquifer characterisation.

14. Publications

1. Dirwai TL, Senzanje A, Kanda E, Busari I. (2021). Integrated Water Resource Management (IWRM) and Smallholder Irrigation – Past, Present and Future Prospects: A Systematic Review of Case Studies of East, West and Southern Africa. PLOS ONE 16(5):e0236903. DOI: 10.1371/journal.pone.0236903
2. Dirwai TL, Senzanje A, Mabhaudhi T. (2021). Moistube Irrigation Fouling Due to Anaerobic Filtered Effluent (AF) and Horizontal Flow Constructed Wetland (HFCW) Effluent: Experimental and Modelling Results. Scientific Reports 11 (7124). <https://doi.org/10.1038/s41598-021-86737-7>

3. Dirwai TL, Senzanje A, Mabhaudhi T. (2021). Calibration and Evaluation of the FAO AquaCrop Model for Canola (*Brassica napus*) Under Varied Moistube Irrigation Regimes. *Agriculture* 11(410). DOI: 10.3390/agriculture11050410
4. Dirwai TL, Senzanje A, Mabhaudhi T, Kanda EK. (2021). Moistube Irrigation Development, Adoption, and Future Prospects: A Systematic Scoping Review. *Heliyon* 7(2). <https://doi.org/10.1016/j.heliyon.2021.e06213>
5. Dirwai TL, Senzanje A, Mabhaudhi T (2020). Moistube Irrigation (MTI) Discharge Under Variable Evaporative Demand. *PLoS ONE* 15 (12): e0236211. <https://doi.org/10.1371/journal.pone.0236211>
6. Dirwai TL, Senzanje A, Mudhara M. (2019). Assessing the Operational and Functional Relationship between Irrigation Infrastructure and Water Governance in Smallholder Irrigation Agriculture. *Physics and Chemistry of the Earth*. 112 (2019): 12-20. <https://doi.org/10.1016/j.pce.2018.11.002>.
7. Dirwai TL, Senzanje A, Mudhara M. (2019). Water Governance Impacts on Water Adequacy in Selected Smallholder Irrigation Schemes in KwaZulu-Natal Province, South Africa. *Water Policy* . 21 (2019): 127-146. <https://doi.org/10.2166/wp.2018.149>.
8. Dirwai TL, Senzanje A, Mudhara M. (2019). An Investigation and Condition Assessment of the Existing Water Control Infrastructure in Selected Smallholder Irrigation Schemes: Case of Tugela Ferry Irrigation Scheme and Mooi River Irrigation Scheme. *ICID Journal of Irrigation and Drainage*. 68 (2019): 657-668. <https://doi.org/10.1002/ird.2347>.
9. Dirwai TL, Senzanje A, Mabhaudhi T. (under review). Soil Wetting Geometry under Moistube Irrigation – Model Development and Modelling. *Scientific Reports*.
10. Dirwai TL, Senzanje A, Mabhaudhi T. (under review). Two Dimensional Modelling of Nitrate Transport for Canola (*Brassica napus*. L) Grown Under Moistube Irrigation Using HYDRUS 2D/3D.
11. Dirwai TL, Senzanje A, Mabhaudhi T, Kanda EK, Masanganise J, Mandizvo T, and Odindo AO. (In preparation). Water Use Efficiency of Neglected and Under Utilised Crops Under Irrigated Conditions in Africa: A sub-Sahara Africa Meta-Analysis. *Target Journal: Sustainability*.
12. Taguta C, Dirwai, TL, Senzanje, A, Mabhaudhi, T. (In preparation). Sustainable Irrigation Technology in Water-Energy-Food (WEF) Nexus and the Future – More Crop Per Drop, Joule and Hectare. *Target Journal: Science of the Total Environment*.

Book Chapter(s)

1. Dirwai, T. L., Senzanje, A., and Mabhaudhi, T., “Sustainable irrigation technology for the future—More crop per drop,” in *Sustainable Engineering Technologies and Architectures*, edited by D. S-K. Ting and J. A. Stagner (AIP Publishing, Melville, New York, 2021), pp. 7-1–7-18.

Technical Reports

1. Senzanje, A & Dirwai, TL. (2020). Water and Agriculture in the Zambezi River Basin: Characterization of Current Agriculture Activities, Future Potential Irrigation Developments and Food Security to Face Climate Variability in the Zambezi River Basin (ZRB). A Report Submitted to the EU-Joint Research Commission on Assessing Water-Energy-Food-Ecosystem (WEFE) Interdependencies Across the Zambezi River Basin: Agriculture and Water.
2. Mudhara, M, Senzanje, A, Dirwai, TL, Phali, L, Dlangalala S. (2020). Assessment of Policies and Strategies for the Governance of Smallholder Irrigation Farming In Kwazulu-Natal Province, South Africa. WRC Report No. 2556/1/20. ISBN 978-0-6392-0161-0.

15. Professional Referees

Dr Aidan Senzanje
Department of Bio-resources Engineering
University of KwaZulu-Natal
Pietermaritzburg Campus
KwaZulu-Natal
South Africa
Tel: +27-33-260-6064
senzanjea@ukzn.ac.za

Professor Maxwell Mudhara
School of Agriculture and Environmental Science
University of KwaZulu-Natal
Pietermaritzburg Campus
KwaZulu-Natal
South Africa
Tel: +27-33-260-5518
mudharam@ukzn.ac.za

Mr Harsen Nyambe Nyambe
Director Sustainable Environment and Blue Economy
African Union Commission
Addis Ababa
Ethiopia
Email: NyambeH@africa-union.org

Professor Tafadzwa Mabhaudhi
Umgeni Resilience Project Co-ordinator
University of KwaZulu-Natal
Pietermaritzburg, KwaZulu-Natal
South Africa
Tel: +27-33-260-5452
mabhaudhi@ukzn.ac.za

Mr John Kalala Ngeleka
Director GHET
25 Trichy Road Northdale
Pietermaritzburg
South Africa
Tel: +27-78-884-5263
johnkalala.ngeleka@get-sa.co.za