

TAKUNDA YEUKAI CHITAKA

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EDUCATION

2016 – 2020 | University of Cape Town | PhD in Chemical Engineering

Thesis: Inclusion of leakage into life cycle management of products involving plastic as a material choice

- Quantified itemized plastic flows into the ocean based on a series of beach surveys
- Developed leakage rates for products identified as prone to accumulation in the oceans
- Explored life cycle management (LCM) approaches for plastic products in South Africa, via extensive engagement with stakeholders across the plastic value chain
- Developed product case studies whereby LCM approaches were investigated, and sustainability performances of different interventions evaluated
- Investigated feasibility and potential influence of using product specific leakage rates as a proxy indicator during plastic product LCM

2014 – 2015 | University of Cape Town | MPhil Specializing in Sustainable Mineral Resource Development

Thesis: Sustainability performance analysis and decision-making for minerals beneficiation: a South African iron and steel scrap case study

- Employed multi-criteria decision analysis to compare the sustainability performance of three alternatives for the fate of steel scrap (i.e. export, or beneficiation in foundries or steel mills)
- Investigated industry and institutional stakeholder challenges via interviews

This research was funded by KwaZulu-Natal Department of Economic Development, Tourism and Environmental Affairs to inform the development of a mineral beneficiation strategy for the province.

2010 – 2013 | University of Cape Town | BSc (Hons) in Chemical Engineering

Thesis: Environmental assessment of plastics recycling in Cape Town

- Employed Life Cycle Assessment to compare the energy requirements and global warming potential associated with recycling of LDPE, HDPE and PET plastics in Cape Town

RESEARCH EXPERIENCE

2021 – present | African Circular Economy Network | Postdoctoral Research Fellow

- Managing the project on behalf of ACEN
- Investigating the conditions under which a responsible, inclusive and socially just transition to a circular economy is possible

JUST2CE is part of the H2020-SC5-2018-2019-2020 (Greening the economy in line with the Sustainable Development Goals (SDGs)) and funded by the following European Commission's research programme: H2020-SC5-2020-2 scheme, Grant Agreement 101003491 (JUST2CE project)

2020 – present | University of the Western Cape | Postdoctoral Research Fellow

- Value chain analysis of organic waste and e-waste value chains
- Investigating job opportunities in organic waste and e-waste value chains
- Exploring opportunities for growth in the organic waste and e-waste value chains

This research is funded by the Waste Research Development and Innovation (RDI) Roadmap, a Government initiative aimed at supporting South Africa's transition to a circular economy.

2019 – 2020 | Massey University | Visiting PhD Fellow

- Investigated the distribution of litter along the coastline in relation to the Manawatu River estuary
- Conducted a material flow analysis of plastic waste flows from Palmerston North
- Analyzed the distribution of plastic debris along the New Zealand north island coastline

This research was funded by the Association of Commonwealth Universities Blue Charter Fellowship.

TEACHING EXPERIENCE

- 2019** **University of Cape Town | Teaching Assistant – Industrial ecology**
➤ Assisted students with tutorials
- 2018 – 2019** **University of Cape Town | Supervisor – Third year undergraduate research projects**
➤ Designed and structured research project
➤ Trained students on research methodology
➤ Provided constructive feedback on data analysis and reporting
- 2018** **University of Cape Town | Supervisor – Final year undergraduate research project**
➤ Introduced project background and advised on relevant literature
➤ Advised on research approach and methodology
➤ Provided constructive feedback on data analysis and reporting
- 2016 – 2018** **University of Cape Town | Teaching Assistant – Life cycle assessment**
➤ Assisted in course assignment development
➤ Assisted students with tutorials and assignments
- 2017** **University of Cape Town | Lecturer – First year chemical engineering**
➤ Planned overall course structure and schedule
➤ Prepared and delivered course material
➤ Set and marked appropriate assessments including tests and exams
- 2017** **University of Cape Town | Senior Teaching Assistant – Final year undergraduate research project**
➤ Planned and organised course activities
➤ Coordinated course activities with research groups and supervisors
➤ Coordinated marking with internal and external examiners
- 2015 – 2016, 2019** **University of Cape Town | Assistant Lecturer – First year chemical engineering**
➤ Planned course structure and schedule
➤ Prepared and delivered course material
➤ Set and marked appropriate assessments
- 2015 – 2016** **University of Cape Town | Senior Teaching Assistant – First year chemical engineering**
➤ Managed a team of teaching assistants and coordinated their activities
➤ Assisted students with tutorials and project assignments

INDUSTRY EXPERIENCE

- 2014** **The Green House | Intern**
➤ Assisted on the development of a sustainability-oriented strategy for the South African textile industry
- 2012 – 2013** **Unilever Zimbabwe | Intern**
➤ Investigated the reduction of contaminant levels in wastewater emissions from a dissolved air flotation plant

SCHOLARSHIPS AND AWARDS

- 2019** Association of Commonwealth Universities Blue Charter Fellowship
- 2019** PETCO Excellence in Academia Award
- 2019** South Africa National Research Foundation Extension Support Doctoral Scholarship
- 2018 – 2019** UCT Engineering and the Built Environment Postgraduate Research Award
- 2017 – 2018** South Africa National Research Foundation Innovation Doctoral Scholarship
- 2017** UCT Conference Travel Grant
- 2016 – 2019** UCT International Students' Scholarship
- 2014 – 2015** Graça Machel Scholarship

SPECIALISATION

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| ➤ Material flow analysis | ➤ Life cycle management |
| ➤ Circular economy | ➤ Sustainability assessment |
| ➤ Life cycle assessment | ➤ Waste management |

SKILLS

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| ➤ Data analysis | ➤ Organization and planning |
| ➤ Instructing and training | ➤ Problem solving |
| ➤ Interview protocol and analysis | ➤ Project management |
| ➤ Oral and written communication | ➤ Stakeholder management |
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COMPUTING

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| ➤ MS Office | ➤ Simapro |
| ➤ NVivo | ➤ Statistica |
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PUBLICATIONS

- **Chitaka, T.Y.**, von Blottnitz, H., and Cohen, B. 2018. The role of decision support frameworks in industrial policy development: a South African iron and steel scrap case study. *Sustainable Production and Consumption*, 13, pp. 11 – 125.
 - **Chitaka, T.Y.**, Cohen, B., and von Blottnitz, H. 2019. Circular economy local or global? The case of the South African iron and steel industry. In *Sustainable development in Africa: Case studies*. Al-Hassan, Masinja and Nagao, Eds. Denver: Spears Media Press.
 - **Chitaka, T.Y.**, and von Blottnitz, H. 2019. Accumulation and characteristics of plastic debris along five beaches in Cape Town. *Marine Pollution Bulletin*, 138, pp 451 – 457.
 - **Chitaka, T.Y.**, Russo, V., and von Blottnitz, H. 2020. In pursuit of environmentally friendly straws – a comparative life cycle assessment of five straw material options in South Africa. *The International Journal of Life Cycle Assessment*, 25, pp. 1818 – 1825.
 - **Chitaka, T.Y.** and von Blottnitz, H. 2021. Development of a method for estimating product-specific leakage propensity and its inclusion into the life cycle management of plastic products. *The International Journal of Life Cycle Assessment*, 26, pp 1431 – 1438
 - **Chitaka, T.Y.** 2021. Environmentalism or greenwashing? South African value chain actor responses to plastic straw marine pollution. *South African Journal of Science*.
 - **Chitaka, T.Y.**, de Kock, L. and von Blottnitz, H. 2022. Evolution of value chain and governance actor responses to the plastic leakage problem in South Africa. *Frontiers in Sustainability*.
 - Ryan, P.G. and **Chitaka, T.Y.** 2022. Do we need more research on the environmental impacts of plastics? *Environmental Research Letters*. 17.
 - **Chitaka, T.Y.** and Schenck, C. 2022. Transitioning towards a circular bioeconomy in South Africa : Who are the key players? *South African Journal of Science*.
 - **Chitaka, T.Y.**, Moyo, T., Gihring, K. & Schenck, C.J. 2021. The myth of livelihoods through urban mining: the case of e-waste pickers in Cape Town. *South African Journal of Science*.
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CONFERENCES

Oral Presentations

- Jun 2022** ‘Circular economy in Africa: just transitions’
European Development Days 22
- Sept 2019** ‘Integration of leakage rates into life cycle management of products involving plastic as a material choice’
9th International Life Cycle Management Conference, Poznan, Poland
- Jul 2017** ‘Estimating plastic leakage into the environment: the South African case’
African Marine Waste Conference, Port Elizabeth, South Africa.

Poster Presentations

- Sept 2017** ‘Plastic end-of-life: managing material choice without another impact category indicator?’
8th International Life Cycle Management Conference, Luxembourg, Luxembourg.
- Mar 2016** ‘Sustainability performance analysis and decision-making for minerals beneficiation: a South African iron and steel case study’
International Conference on Sustainability Science, Stellenbosch, South Africa.
- Aug 2015** ‘Sustainability performance analysis and decision-making for minerals beneficiation: a South African iron and steel case study’
33rd annual SAIMM Mineral Processing Conference, Cape Town, South Africa.
- Aug 2014** ‘Sustainability performance analysis and decision-making for minerals beneficiation: a South African iron and steel case study’
32nd annual SAIMM Mineral Processing Conference, Cape Town, South Africa.

WORKSHOPS

- Jun 2021** ‘Integrating leakage in LCAs: the need and the approach’
EPR Webinar: LCA as a tool to evaluate single-use plastics in South Africa
- Jul 2019** ‘Sustainability is not black and white, but 50 shades of grey’
PETCO – What on earth is going on? Cape Town, South Africa
- Apr 2019** ‘An academic perspective on plastic pollution’
Institute of Packaging South Africa Seminar on Single-Use Plastics and the Environment: A South African Perspective, Stellenbosch, South Africa
- Oct 2018** ‘Looking at the big picture: the role of life cycle assessment in product design’
PETCO Designing for the Environment Workshop, Cape Town, South Africa.
- May 2018** ‘A survey of litter abundance and accumulation rates on 5 Cape Town beaches’
Workshop on Connecting Expert Communities to Address Marine Litter in Life Cycle Assessment, Brussels, Belgium.
- Aug 2022** ‘Plastic pollution on the beaches of Cape Town’
Geosciences Information for Teachers. Cape Town, South Africa

PEER REVIEW EXPERIENCE

Review of research papers submitted to *Marine Pollution Bulletin* and the *South African Journal of Science*.

PROFESSIONAL MEMBERSHIP

Candidate Engineer – *Engineering Council of South Africa*

ACTIVITIES & INTERESTS

- 2021 – present** Member – *South African E-Waste Policy Working Group* to inform the development of a national e-waste policy
- 2020 – present** Member – *Gauteng E-Waste Management Strategy Steering Committee*
- 2020 – present** Founder and coordinator – *South African E-Waste Research Working Group*: a platform for promoting collaboration amongst universities and organizations conducting e-waste research
- 2020 – present** Co-founder and coordinator – *Ocean Plastic Webinars*: a webinar series dedicated to promoting scientific research on the origin and fate of ocean plastic
- 2020 – present** Co-organizer – *DSI/NRF/CSIR Chair in Waste and Society Webinar Series*: a platform that brings together academics, researchers, policy makers, municipal government officials and industry representatives to engage on various issues related to waste management