

## College of Agriculture and Environmental Sciences

### Research focus areas for 2023: Department of Environmental Sciences

#### Environmental Management and Environmental Sciences Programme Group

Focus area	Researchers in the focus area	Specialisation of researchers in the focus area	Profile of the researcher	Research project themes	Capacity per researcher for 2023
Environmental management	Roelien du Plessis dplesr@unisa.ac.za	Waste management	Roelien du Plessis is a lecturer in the Department of Environmental Sciences, with a MSc obtained from Unisa. Her expertise lies in the broad area of Environmental Management with a specific focus on Waste Management and licensing.	1. Recycling initiatives. 2. Waste management in municipalities	MSc: 1
	Prof K Mearns mearnkf@unisa.ac.za	Sustainable tourism Nature-based tourism  Community-based natural resource management  Coastal and Marine tourism	Prof Kevin Mearns is a full professor in the Department of Environmental Science. Prof Mearns hold a PhD degree from the University of Portsmouth in the United Kingdom. Prof Mearns' research interests include the sustainability of tourism	1. Water, waste and Energy Benchmarking of Nature-based tourism 2. Community-based natural Resource 3. Environmental Management with emphasis on tourism. 4. Coastal and Marine tourism	MSc: 2 PhD:1

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			(including social, economic and environmental aspects), the social dimensions of conservation areas, ecotourism, community-based tourism and community-based natural resource management.  <b>Methodology expertise:</b> Qualitative and Mixed-method research		
	Prof JA Wessels wessej@unisa.ac.za	Environmental Impact Assessment and Follow-up	Prof Jan-Albert Wessels is an associate professor in the Department of Environmental Sciences. He holds a PhD from the North-West University. His research focuses on human capital development and capacity building through establishing Environmental Impact Assessment (EIA) follow-up as a measure of enhancing the scientific contribution of environmental impact assessment and management to sustainability compliance.  <b>Methodology expertise:</b> Qualitative and Mixed-method research	1. Enhancing EIA Follow-up in Environmental Impact Assessment and Management Systems (EIAMS) 2. Defining the roles and responsibilities of Actors in EIA Follow-up 3. Determining the value of independent and community-based monitoring and verification Actors 4. Regulating the professionalism of Actors in EIA Follow-up of sustainability commitments	MSc: 2
	Dr U van den Berg	Systematic literature reviews on environmental management matters	Dr Unine van den Berg is a lecturer in the Department of Environmental Sciences. Her research focus is systematic literature reviews on environmental management matters		MSc: 2

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			impact mitigation management.		
	Ms A Mudau	Environmental management, Sustainable management of freshwater resources, Geology	Ms Mudau is a Lecturer in the Department of Environmental Sciences. She holds an Applied Geology Master's degree from the University of the Western Cape. She is currently registered for her PhD in Environmental Sciences at Unisa. Her research interest is environmental management, freshwater resource management, and air quality	<ol style="list-style-type: none"> <li>1. Ambient air quality</li> <li>2. Source Apportionment</li> <li>3. Sustainable management of Freshwater resources</li> <li>4. Water quality</li> </ol>	MSc: 1

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	Dr M Togo		<p>Prof M Togo is an Associate Professor in the Department of Environmental Sciences. She holds a PhD from Rhodes University. Broadly, her research focus is on Environmental Management, but specifically focusing on adaptation to climate change in the context of the Green economy and the SDGs - policies and practices for a green economy</p> <p><b>Methodology expertise:</b> Mixed-methods research</p>	Adaptive green responses to climate change impacts in various sectors of the economy for example in industry, in universities and at household level	1PhD 1MSc
	Dr M Chitakira	Society-environment interaction: Ecoagriculture	<p>Prof M Chitakira is an Associate Professor in the Department of Environmental Sciences at Unisa. He holds a PhD in Environment and Society from the University of Pretoria, a Masters in environmental Policy and Planning and a Post-graduate Diploma in Education from the University of Zimbabwe. Prof Chitakira's research interest is in the dynamics of the interaction between human beings and the biophysical environment with a focus on climate smart landscapes management (climate- smart agriculture; climate-smart Livelihoods); gender and the Environment, transfrontier conservation areas management and stakeholder engagement.</p>	<ol style="list-style-type: none"> <li>1. Urban / peri-urban agriculture in Africa – in relation to sustainable Development goals (SDGs), food security, resilience and adaptation to climate change;</li> <li>2. Women, youths and the disadvantaged groups in agriculture and / or in transfrontier conservation areas management;</li> <li>3. Critical success factors for climate-smart agriculture in the African context;</li> <li>4. Stakeholder engagement in environmental management.</li> </ol>	MSc: 1 PhD: 1

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Environmental management /Environmental sociology	Prof L Leonard		<p>Prof Leonard is a full Professor in the department of Environmental Sciences. Prof Leonard has an MSc (Water Quality and Environmental Management) from the University of KwaZulu-Natal and a PhD from Kings College London. His research interests include environmental justice and sustainability with focus on democracy and governance; civil society-state-industry relations. Before joining academia he worked on environmental justice issues related to industrial, medical and municipal waste, landfills, mining, air pollution, incineration, cleaner production techniques and obsolete pesticides to name a few.</p>	<ol style="list-style-type: none"> <li>1. Civil society-state-industry conflicts over the environment and development.</li> <li>2. Industrial development impacts on tourism/conservation areas</li> <li>3. Climate change and sustainable livelihoods</li> <li>4. Governance of the Environment</li> <li>5. Science communication and industrial expertise</li> </ol>	Masters: 3 PhD: 1

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Green Infrastructure	Ms Liezl Craig <a href="mailto:craigl@unisa.ac.za">craigl@unisa.ac.za</a>	Low Impact Development	Ms Liezl Craig is a lecturer in the Department of Environmental Sciences. She has a background in landscape architecture and holds a Master's degree in Integrated Water Management from Monash South Africa. She is currently enrolled for a PhD with North-west University in Development and Management for Water Studies. Her research focus is on the use of green infrastructure in the South African context.	<ol style="list-style-type: none"> <li>1. Diffusion of green infrastructure in South Africa</li> <li>2. Sustainable stormwater management</li> <li>3. Integrated urban water management</li> <li>4. Value of green open spaces</li> <li>5. Knowledge transfer on green infrastructure</li> </ol>	MSc: 1
Urban forestry and climate change mitigation and adaptation in (mostly) urban settings.	Prof Hennie Stoffberg	Urban forestry dynamics Landscape architecture and green infrastructure Vegetative Carbon accounting and carbon footprints	Hennie Stoffberg is an Associate Professor specializing in carbon sequestration and carbon footprint accounting mostly in urban environments. He holds a PhD specializing in Urban Forestry, Master of Environmental Sciences and Bachelor in Landscape Architecture. Prof Stoffberg is ideally positioned to work across disciplines and in multidisciplinary environments. Quantitative methodologies are a prerequisite.	<ol style="list-style-type: none"> <li>1. Urban forest and urban vegetation analysis</li> <li>2. Urban carbon sequestration, storage and commerce.</li> <li>3. Tree inventories</li> <li>4. Carbon footprints</li> <li>5. GBCSA and SITES Landscape Architecture investigations.</li> <li>6. WRI GHGP &amp; DEFRA carbon foot printing</li> </ol>	MSc: 2 PhD: 1
Water Science and Policy	Dr Malebo Matlala	Water Quality Monitoring, International water law and policy	Dr Matlala is a lecturer in the Department of Environmental Sciences. She holds a PhD from the university of South Africa, an LLM in Water Law from the University of Dundee, in Scotland,	<ol style="list-style-type: none"> <li>1. Aquatic Ecology</li> <li>2. Spatio-temporal variations in water resources</li> <li>3. Water Quality Monitoring</li> <li>4. Transboundary Water Governance</li> <li>5. GIS and Remote Sensing and machine learning</li> </ol>	MSc: 3

		<p>as well as an MSc from the North-West University.</p> <p>Dr Matlala's research focuses on the assessment and monitoring of water resources, the protection, management and governance of water resources, as well as the application of geographical information systems, remote sensing, and machine learning techniques in water studies.</p>	6. Applications in water studies	
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Remote Sensing of the Environment	M Jordaan jordam@unisa.ac.za	Satellite Image Analysis	Mr M Jordaan is a lecturer in the Department of Environmental Sciences, With MSc from UJ. His research focus is remote sensing for environmental applications.	1. Spectral analysis of vegetation 2. Accuracy assessment of remote sensing methods 3. Remote Sensing applications for conservation purposes	MSc: 1
Environmental Science and Environmental Management	Dr K Semenya semenk@unisa.ac.za	Household energy	Dr K Semenya is a Senior Lecturer in the Department of Environmental Sciences. Her research focus is household Energy and air pollution in rural areas.	1. Sustainable energy 2. Sustainable development 3. Air quality 4. Exposure and health assessments.	MSc: 2 PhD:1
Environmental Pollution, Ecotoxicology and Remediation Studies (EPERS)	Prof M Tekere tekerm@unisa.ac.za	Environmental Microbiology/biotechnology Pollution and remediation	Prof Tekere is a full professor in the Department of Environmental Sciences. Her research experience and interests are in Environmental Biotechnology and Microbiology and her	1. Microbial diversity in different environments and bioprospecting 2. Pollution Bioremediation research studies 3. Environmental pollution incl. emerging pollutant studies, water quality and waste management	MSc: 2 PhD: 2



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			work focuses on bioremediation of pollutants as well as the study of microbial diversity in different habitats particularly extreme and polluted environments. Other areas of research interest include water quality, municipal and industrial waste water treatment and solid waste management.		
	Prof LL Sibali <a href="mailto:siballl@unisa.ac.za">siballl@unisa.ac.za</a>	Environmental/ Analytical Chemistry	Prof Sibali is an Associate Professor and Director: School of Ecological and Human Sustainability.  His research focus area is based on the emerging chemical pollutants in the Environment.	Pollution monitoring and remediation of emerging chemical using polymeric composite nanoparticles materials.	9 MSc 10 PhD
	Dr TC Fouché <a href="mailto:fouchtc@unisa.ac.za">fouchtc@unisa.ac.za</a>	Soil ecotoxicology	Dr T Fouché is a senior lecturer in the department of Environmental Science. She holds a PhD in Environmental Science from the NWU and teaches soil science. Her research focuses on the ecotoxicological and genotoxic effects of organic and inorganic pollutants in the soil ecosystem. Other research interests include phytoremediation and Indigenous knowledge related to soil organisms.	<ol style="list-style-type: none"> <li>1. Assessing soil health using bioindicator assays.</li> <li>2. Threats to soil biodiversity and their ecosystem services.</li> <li>3. Assessing the phytoremediation ability of various crops on heavy metal polluted soil.</li> </ol>	MSc: 2 PhD: 1
	Dr KW Maphangwa <a href="mailto:maphakw@unisa.ac.za">maphakw@unisa.ac.za</a>	Environmental Monitoring and Assessment	Dr KW Maphangwa is a Lecturer in the Department of Environmental Sciences. He holds a Master's degree from University of the	<ol style="list-style-type: none"> <li>1. Plants as indicators of pollution</li> <li>2. Plants as indicators of heavy metals</li> <li>3. Air and water quality monitoring</li> </ol>	MSc: 3

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			Western Cape and PhD in Environmental Science from UNISA		
	Mr ND Baloyi baloynd@unisa.ac.za	Environmental/Analytical Chemistry	Mr Ntsako Baloyi is a Lecturer in the Department of Environmental Sciences. He holds a Master's degree from Unisa. His research focus is Environmental pollution and monitoring.	1. Water quality monitoring 2. Persistent organic pollutants such as ECDs in the environment	MSc: 3
Environmental Soil Science, Pollution studies and Exposure Health Risk Assessment	Prof VM Ngole-Jeme	Environmental soil chemistry  Heavy metal behavior in soils  Exposure risk assessment  Emerging pollutants in the environment	Prof VM Ngole-Jeme is a Professor in Environmental Sciences. She holds a PhD in Environmental Sciences from University of Botswana. Her Research focuses on monitoring and assessment of inorganic pollutants in the soil environment and evaluation of the environmental and human health risks associated with exposure to these pollutants. She has vast experience in the characterization of heavy metals and emerging pollutants in various environmental media.	1. Recovery of environmental pollutants from remediation materials 2. Human health risk assessment of heavy metal 3. Interaction between Endocrine Disruptive Compounds and Heavy metals in the soil environment.	MSc: 4 PhD: 1

Air Pollution and Health Effects	Ms Nomsa Thabethe ethabend@unisa.ac.za	Air Quality	Nomsa Thabethe is a Lecturer in the Department of Environmental Science. She holds 2 Masters degrees, one in Environmental health (Tshwane University of Technology) and the other one in Epidemiology (University of Pretoria). She is currently studying towards a Phd in Exposure Science/ Public Health with the University of the Witwatersrand. Her research interests are air quality monitoring, air quality modeling, Environmental health	<ol style="list-style-type: none"> <li>1. Ambient air Monitoring</li> <li>2. Air quality modelling</li> <li>3. Source apportionment</li> <li>4. Chemical apportionment</li> <li>5. Environmental Health</li> <li>6. Human Health Risk Assessment</li> </ol>	MSc: 4
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Environmental Sciences/Soil Science	Dr GP Nortje nortjgp@unisa.ac.za	<p>Soil Science in Conservation/Eco-tourism. Human impact on soils in protected areas.</p> <p>Soil rehabilitation. Soil surveys and road planning for Protected areas.</p> <p>Sub-tropical fruit production.</p> <p>Soil fertilization in Conservation Agriculture</p>	<p>Dr Gerhard Nortjé is a Senior lecturer in Soil Science/Environmental Science. He holds a PhD degree in Wildlife Management/Soil Science from the University of Pretoria, and a Master degree in Sustainable Agriculture from the University of the Free State. His research interests are the application of Soil Science in Conservation, Soil-Plant relationships, Eco-tourist's impacts on the soil/vegetation, Soil mapping for sustainable road planning and off-road driving in protected areas, Sustainable Subtropical fruit production and fertilization.</p> <p><b>Methodology expertise:</b> Mixed-method research</p>	<ol style="list-style-type: none"> <li>Human/Eco-tourist impacts on soil physical degradation in protected areas</li> <li>Soil crusting/sub-soil compaction <ul style="list-style-type: none"> <li>Development of sustainable recreational activities in protected areas-MTB routes etc.</li> </ul> </li> <li>Protected area management</li> <li>Soil/Plant relationships</li> <li>Subtropical fruit production (avocado, macadamia) – production, fertilization, norms, irrigation, stinkbug management.</li> <li>Soil rehabilitation/soil mapping &amp; classification</li> <li>Sustainable soil management.</li> <li>Diagnosis and Recommendation Integrated System (DRIS) to assess the Nutritional State of crop plants</li> <li>Conservation Agriculture (CA).</li> </ol>	MSc: 2 PhD: 1
Plant and Soil	Dr L Khomo	Soil biochemistry	I work on the biogeochemistry of soil, plant and animal interactions in natural ecosystems	Anything related to plant, soil and animal dynamics in natural ecosystems.	MSc: 2 PhD: 2

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Environmental Geology	Me HJ van Niekerk vniekhj@unisa.ac.za	Environmental Geology	<p>Mrs HJ van Niekerk is a lecturer in the Department of Environmental Sciences. She holds post graduate qualifications in Environmental Geology and Distance Education. Her research experience and expertise are on sedimentology, isotopic geochemistry (detrital zircon U-Pb geochronology, Nd and Sr), and geological block modelling. Her work focuses on the provenance and palaeo-depositional environments of sedimentary basins, and the development of drainage basins in Africa. Other areas of interest includes whole rock and mineral geochemistry and water related issues.</p> <p><b>Methodology expertise:</b> Qualitative research/ case study research</p>	<ol style="list-style-type: none"> <li>1. Effects of Pliocene-Pleistocene climatic changes on the evolution of The Orange, Limpopo and Zambesi Rivers, Southern Africa</li> <li>2. Geoparks in South Africa</li> <li>3. Water Legislation in SA</li> <li>4. Development and application of a SuperCaesar model using machine learning</li> </ol>	MSc: 4
	Dr Lindani Ncube ncubel@unisa.ac.za	Environmental Geology	<p>Dr L Ncube is a Lecturer in the Department of Environmental Sciences. She holds a PhD in Geology from the University of Fort Hare. Her research experience and expertise are on sedimentology, isotopic geochemistry (detrital zircon U-Pb geochronology, Nd and</p>	<ol style="list-style-type: none"> <li>1. Effects of Pliocene-Pleistocene climatic changes on the evolution of the Limpopo and Zambesi Rivers, Southern Africa</li> <li>2. Geoparks in South Africa</li> <li>3. Water Legislation in SA</li> <li>4. Development and application of a SuperCaesar model using machine learning</li> </ol>	MSc: 2 PhD: 3

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			<p>Sr), and geological block modelling. Her work focuses on the provenance and palaeo- depositional environments of sedimentary basins, and the development of drainage basins in Africa. Other areas of interest include whole rock and mineral geochemistry and water related issues.</p> <p><b>Methodology expertise:</b> Qualitative research/ quantitative research</p>		
Wetland ecology	Mr, M. Mogashoa	Wetland identifications, assessments and classification.	I am a Junior lecturer at the department of Environmental Sciences. My background is in Geology, ultimately branching into wetlands and associated systems.	<p>Wetland assessment and classification</p> <p>Species diversity assessment in wetlands</p> <p>Hydrogeomorphic assessment of wetlands</p>	MSc: 1

Water and Wastewater treatment	Ms T.N. Mhlongo eshongtn@unisa.ac.za	Water quality management, Water and Wastewater treatment, Water resources management	M-Tech Civil Engineering specializing in Water Resources Management, BSc Environmental Health Science specializing in Water and Sanitation and Diploma in Water Technology specializing in Water and Wastewater Engineering	<ul style="list-style-type: none"> <li>• Water and Wastewater treatment processes in the removal of emergent microbial pollutants</li> <li>• Contaminants effect on ecosystem services considering biotic and abiotic indices, land-use and biodiversity</li> <li>• Development of technologies for the remediation of wastewater and resource recovery</li> <li>• Innovative techniques for safe guiding the ecosystem against pollution</li> <li>• Scientific bases for water quality risk assessment and risk management</li> <li>• Organic and inorganic compounds on disinfectants demand and formation of disinfection by-products in wastewater/water treatment plants</li> <li>• Alternative disinfectants to mitigate contaminants emerging as by-products</li> </ul>	1 MSc
Decolonization of African epistemology and ontology of law and science of environment	Prof Machate Machate machef@unisa.ac.za	<ol style="list-style-type: none"> <li>1. Law</li> <li>2. Environmental Health</li> <li>3. Environmental Science</li> <li>4. Environmental Management</li> </ol>	Prof Machate is a Full Professor in the Department the Department of Environmental Science. He is a Lawyer with an LLB, and a Scientist with BTech in Environmental Health, MSc in Environmental Science and holds a PhD in Environmental Management. He is an advocate of the decolonization and indigenization of knowledge and their application in different human developmental areas of science and law.	<ul style="list-style-type: none"> <li>• Comparative studies of the efficacy of African indigenous practices vs colonial theories of law, health and environmental sciences.</li> <li>• Exploring and re-evaluation of African epistemologies and ontologies of sustainable development, justice, democracy and humanity</li> <li>• Exploring African indigenous methods of improving the quality of lives of Africans and of sustainable use of environmental resources, eradication of poverty, unemployment and inequality</li> </ul>	MSc:3 PhD:2

<b>Social ecology</b>	Mr SB Hlabisa hlabisbl@unisa.ac.za	Environmental performance Society and the environment	Mr Hlabisa is a lecturer in the Department of Environmental Sciences. He holds a Master's degree from the Monash University and is currently enrolled for a PhD with the University of the Witwatersrand. He also holds a Bachelor of Technology degree in Nature Conservation as well as a National Diploma, both from Mangosuthu University of Technology. His research focus is on environmental and natural resource access.	<ol style="list-style-type: none"> <li>1. Environmental performance</li> <li>2. Conservation and livelihoods.</li> <li>3. Resource-use, access, and governance</li> <li>4. Community based natural resource management.</li> </ol>	Masters: 2
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