



UNIVERSITY OF CAPE TOWN  
IYUNIVESITHI YASEKAPA • UNIVERSITEIT VAN KAAPSTAD

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UNIVERSITY OF CAPE TOWN  
**SUSTAINABILITY**  
AND THE

**SDGS 2023**





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# Harnessing UCT's unique position in Africa to drive social, environmental and intergenerational justice

## Vice-Chancellor, Professor Mosa Moshabela

The United Nations' Sustainable Development Goals (UN SDGs) and the African Union's (AU) Agenda 2063, have at their heart, the issue of intergenerational justice. Our current squandering of our planetary resources and transgressing of planetary boundaries give rise to many imaginings of dystopian futures. This is an unfortunate legacy we look to be leaving for future generations.

Universities are a great source of hope in this context. Our research can address current and future challenges, our teaching and learning can educate and inspire future leaders, we are networked into communities and policy makers, and we can set the example on our campuses. As Gandhi said 'we must be the change we wish to see in the world'.

The University of Cape Town's (UCT) position at the tip of Africa affords us unique challenges and opportunities in this work. The continent is at the sharp end of a failure to achieve the SDGs. Our much-vaunted youth dividend will not be

realised until we make progress in the areas of social and environmental justice. This places a burden of responsibility on those of us embedded in the deep knowledge of the contexts in which research is needed and from which teaching must spring. We need to ensure that Africa-centred knowledge drives the solutions we seek.

At the same time, our academics and students have access to extraordinary locations, populations and infrastructure. The university has three oceans on its doorstep, the great southern skies above and the most diverse floral kingdom on the planet. The African population has the richest genetic diversity of any other. We are embedded in communities that reflect the most unequal in the world, but with whom we can and do co-create solutions.

It is an exciting time to be researching, teaching and learning in this space, and I hope you will see this enthusiasm reflected in these pages.

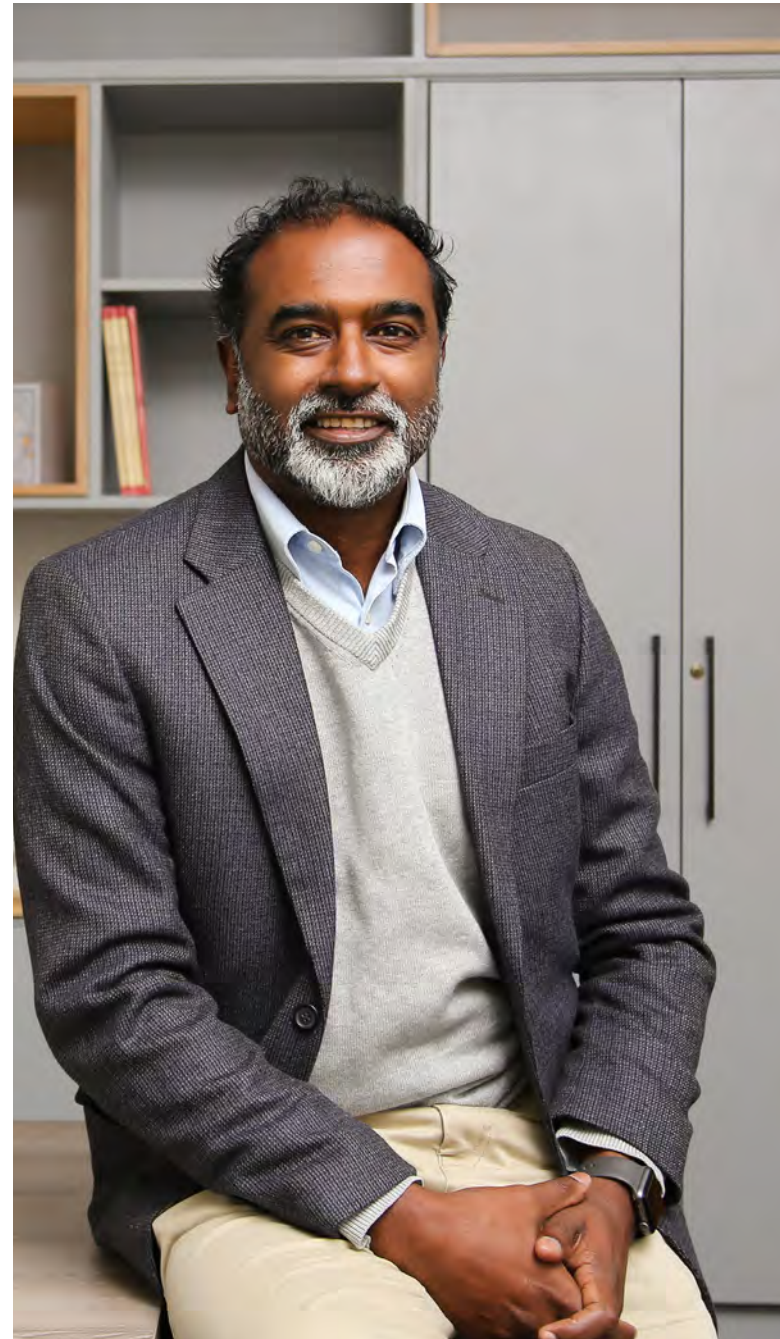






# Leading sustainable impact for Africa and beyond

**Acting Deputy Vice-Chancellor: Research and Internationalisation, Professor Jeff Murugan**



There are three pillars at the core of UCT's Vision 2030 that call on our community to pursue excellence, transformation and sustainability. These pillars give purpose to the university's massive transformative mission to "unleash human potential to create a fair and just society". Our vision is rooted in the conviction that Africa should lead the way in shaping its own developmental agenda as captured in the African Union's Agenda 2063, which predates the SDGs and centres Africa's needs in creating a liveable and thriving continent for its people. Through leveraging the alignments and overlaps of both frameworks, UCT strives to address both global and continental challenges through research, innovation and knowledge production that centres on African experience.

Long before the SDGs were developed, we knew that research, teaching and learning at UCT mapped very closely to the global priorities they address.

To accelerate sustainability efforts on our campus, we created a dedicated directorate in the Office of the Vice-Chancellor and in 2019 appointed a [Director for Environmental Sustainability](#) to lead this function. One of the first initiatives was to develop UCT's [strategy for environmental sustainability](#).

We have also intentionally brought research, teaching and learning and operations together in a living lab project, [Khusela Ikamva](#), which uniquely involves academics, professional and administrative staff and students, in which sustainability solutions are tried, developed and tested on our campus. Khusela Ikamva is expressed in four key pillars: reducing our

carbon footprint, promoting sustainable water use, advancing the nexus between waste, energy and food, and building a community of practice around sustainability. You will find some examples of this scattered through this report.

Last year, our community's efforts towards sustainability were recognised by the Quacquarelli Symonds (QS) World University Sustainability Rankings, affirming our position among global leaders in environmental and social sustainability. This recognition, alongside our achievements in the Times Higher Education (THE) Impact Rankings where we ranked 9th in the world for SDG 6: Clean Water and Sanitation, fuels our commitment to addressing the grand challenges of our time and safeguarding the future for generations to come.

In 2023, we awarded funding to two programme proposals and four pilot projects through the Vision 2030 Grand Challenges Programme. Birthed from the 2030 Research Catalytic Programme, these grand challenges seek to support new forms of working, including heightening inter- and transdisciplinary research and engaged scholarship, to produce high-impact research.

Our goal is not merely to fulfil international benchmarks. We want to make meaningful impact in our continent and the rest of the world. This report offers a glimpse into how we've woven sustainability into every aspect of what we do, from research, teaching and learning to campus operations and community engagement. Our community is walking the path toward a sustainable future for Africa and the world.



1
NO POVERTY


2
ZERO HUNGER


3
GOOD HEALTH AND WELL-BEING


4
QUALITY EDUCATION


5
GENDER EQUALITY


6
CLEAN WATER AND SANITATION


7
AFFORDABLE AND CLEAN ENERGY


8
DECENT WORK AND ECONOMIC GROWTH


9
INDUSTRY, INNOVATION AND INFRASTRUCTURE


10
REDUCED INEQUALITIES


11
SUSTAINABLE CITIES AND COMMUNITIES


12
RESPONSIBLE CONSUMPTION AND PRODUCTION


13
CLIMATE ACTION


14
LIFE BELOW WATER


15
LIFE ON LAND


16
PEACE, JUSTICE AND STRONG INSTITUTIONS


17
PARTNERSHIPS FOR THE GOALS


1
High standard of living, quality of life & well being for all


2
Well-educated citizens & skills revolution under pinned by science, technology & innovation


3
Healthy & well-nourished citizens


4
Transformed economies & job creation


5
Modern agriculture for increased productivity & production


6
Blue/ocean economy for accelerated economic growth


7
Environmentally sustainable & climate resilient economies & communities


8
United Africa (Federal or Confederate)


9
Established key continental financial & monetary institutions


10
World-class infrastructure criss-crosses Africa


11
Democratic values, practices, universal principles of human rights, justice & the rule of law entrenched


12
Capable institutions & transformative leadership in place


13
Peace, security & stability is preserved


14
A stable & peaceful Africa


15
A fully functional & operational African peace & security architecture


16
African cultural renaissance is pre-eminent


17
Full gender equality in all spheres of life


18
Engaged & empowered youth & children


19
Africa as a major partner in global affairs & peaceful co-existence


20
Africa takes full responsibility for financing her development Goals






# SDG 1 NO POVERTY

South Africa is plagued by persistent socio-economic challenges including poverty and inequality. While these are often inhibiting factors, university attendance and graduation can change life trajectories – offering a way to mitigate these hardships, but only if universities provide support to ensure success for students. UCT is dedicated to tackling barriers that limit access to higher education for students, especially those who are marginalised, facing compromised access to good healthcare, education and adequate financial support. Through initiatives focused on food security, social entrepreneurship, child poverty and support for its student community, UCT empowers individuals and creates lasting pathways for social mobility and development.

## Empowering economic inclusion for lasting change

UCT's Bertha Centre is the first specialised space in Africa dedicated to advancing social innovation and entrepreneurship. In 2023, the centre supported 1 278 changemakers, expanding its impact through initiatives like the Bertha Scholars programme, which focuses on empowering a diverse community of youth and entrepreneurs.



The centre also leads the Jasiri Talent Investor Programme, funded by Allan Gray Philanthropies. This initiative has trained over 90 fellows across 28 ventures in East Africa, equipping them with skills in systems thinking and market-creating innovation to tackle poverty and inequality. This has been actualised through the nurturing of social entrepreneurs and early-stage startups and leaders who drive meaningful employment creation in their communities.

## Supporting students in need

UCT recognises the financial hardships that many of its students face and provides support to ensure that financial barriers do not prevent students from achieving their educational goals. In 2023, the UCT Postgraduate Funding Office awarded R355.9 million to 2 801 students through 4 550 scholarships, including 734 international and refugee

students who received 1 122 awards, for a total value of R85 million. These funds, which mark a 5% increase from 2022, support students with tuition, accommodation, meals, travel or anything else, depending on individual student submissions.

## UCT's Children's Institute plays a vital role in promoting child welfare and development in South Africa

In 2023, the Children's Institute's (CI) research for the Department of Social Development modelled strategies to tackle child food poverty and highlighted the positive impact of increasing the Child Support Grant (CSG). This evidence-based approach was key to influencing policy decisions that enhance support for caregivers and improve the well-being of vulnerable children across the country.

**Their efforts secured a R30 increase in the CSG, resulting in an additional budget investment of approximately R4 billion, directly benefiting caregivers nationwide.**





# SDG 2 ZERO HUNGER

UCT recognises that food insecurity remains a critical challenge for many communities across Africa. Through a combination of research and outreach initiatives, the university is contributing to the building of greater food security in the region.

## Food parcels to students in need

UCT acknowledges that food insecurity affects its student community. To address this, the university has implemented the Food Programme, led by the Student Development cluster in the Department of Student Affairs (DSA), which provides monthly grocery packs to students facing financial challenges that impact their ability to access nutritious food. In 2023, the UCT Food Programme provided monthly grocery packs to 7 009 students. This initiative directly addresses the nutritional needs of students who are unfunded, underfunded or face periodic food shortages, ensuring their well-being and supporting their academic success.

## Seeding knowledge

Seeds represent the backbone of agricultural traditions for Africa’s 500 million small-scale farmers. The Seed and Knowledge Initiative (SKI), co-founded by UCT’s DSI/NRF Chair in Environmental and Social Dimensions of the Bio-economy, is a partnership of 15 organisations dedicated to securing food sovereignty in southern Africa.

In 2023, SKI reached over 45 000 smallholder farmers in South Africa, Zimbabwe, Malawi and Zambia, enhancing food security and seed diversity despite challenges like droughts. UCT-led research supports SKI’s mission by exploring community seedbanks, local seed systems and agroecological practices. Research projects undertaken by students feed into the SKI knowledge base, contributing to ongoing learning and innovation that shapes strategies and practical work on the ground.

This collaborative approach directly impacts the lives of thousands of smallholder farmers, bringing them closer to achieving a food-secure reality. SKI’s 2023 publication, African Perspectives on Agroecology further underscores the vital role of farmer-led approaches in driving sustainable agriculture across the region.

## Advancing food security research

In 2023, the African Centre of Excellence for Inequality Research (ACEIR), in collaboration with partners from the University of Ghana, the University of Nairobi, and several European universities, successfully established a research



consortium focused on food security, inequality and public health. This consortium is one of 21 initiatives developed by the African Research Universities Alliance (ARUA) and the Guild of European Research-Intensive Universities to address key issues outlined in the joint Innovation Agenda of the African Union and the European Union.

ACEIR expanded its research and capacity-building efforts in 2023, focusing on food security, non-communicable diseases, climate change and inequality. UCT also plays a crucial role in clusters addressing water resources, pandemic response and infectious diseases — reinforcing its leadership in research excellence across Africa.



# SDG 3 GOOD HEALTH AND WELL-BEING

The health and well-being of the UCT community remain a top priority. UCT offers a range of services supporting mental, physical and reproductive health ensuring accessible healthcare resources at minimal or no cost. In 2023, the university expanded its efforts to improve healthcare access, promote early disease detection and enhance healthcare services in under-resourced areas. By integrating advanced advanced Artificial Intelligence (AI) technology, social innovation and specialised healthcare programmes, the university continues to advance health equity and strengthen healthcare delivery across the region.

## Staff wellness

UCT has partnerships with LYRA Wellbeing and the South African Depression and Anxiety Group (SADAG) to provide psychosocial support for UCT staff and their families. The

SADAG partnership is specifically to assist university staff who are battling with anxiety and depression.

The university also facilitated various training sessions on Mental Health for staff and line managers.

UCT has hosted several staff wellness events across the university’s campuses during 2023. During these events, exhibitors provided interactive demonstrations including screening for blood pressure, cholesterol, diabetes, body mass index, HIV, neck and shoulder massages and clinical breast examinations.

## UCT lifestyle challenge

The programme offers staff support from a dietician, nursing sister and a personal trainer, at minimal cost. The programme includes a wellness screening and monthly progress measurements. A dietician addresses participating staff monthly on healthy eating and they have access to a personal trainer to assist them with their weekly exercise programme.

## Student wellness

UCT’s Student Wellness Service (SWS) offers a comprehensive range of both preventative and responsive healthcare services, supporting students’ physical and mental health.

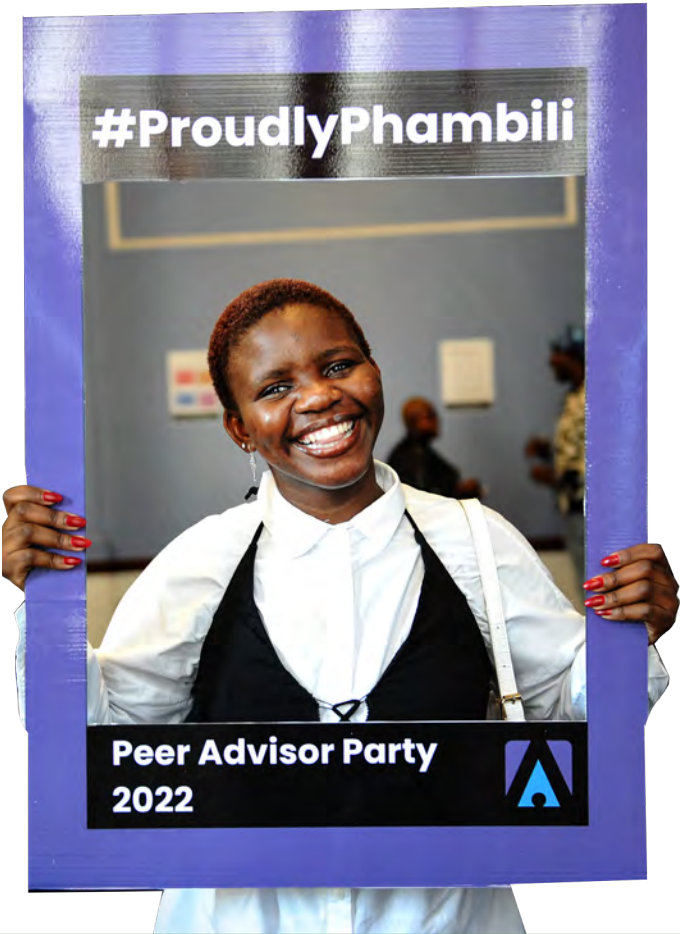
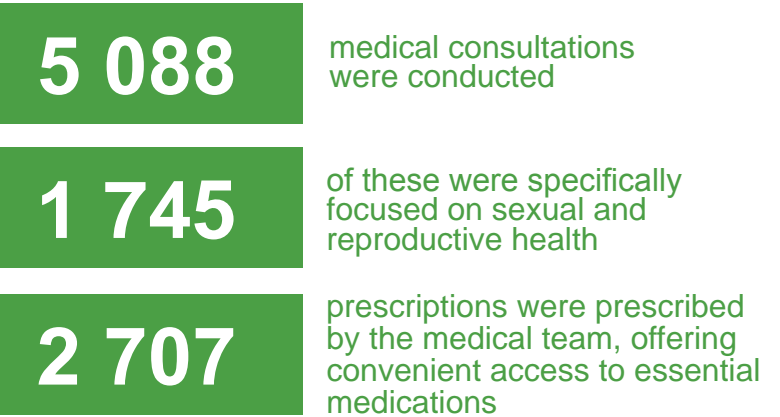
2023 saw an increase in uptake of all the services provided



These offerings are designed to ensure that students have the required resources to succeed academically and personally, with a focus on accessibility and holistic well-being.

## On-campus clinics

Throughout 2023, on-campus clinics provided both in-person and virtual medical consultations to meet the diverse needs of the student community.





### Counselling and mental health services

A range of counselling services was offered to students in 2023:

10 575

counselling sessions were conducted, providing virtual, telephonic and in person support



24-hour

access to counselling services was available through digital platforms like the Panda App, Vimbo App, and Ollie Health, along with telephonic support via SADAG for immediate crisis intervention

### Health promotion and outreach services in 2023

40

health and wellness events were organised, featuring health talks, webinars and workshops with external health experts

2

campus-wide health promotion campaigns engaged students in proactive health practices, promoting overall well-being and preventative care



### Community wellness

#### Khayelitsha Cervical Cancer Screening Project

Over 85% of cervical cancer cases and deaths occur in low-and middle-income countries, with a significant concentration in sub-Saharan Africa. Khayelitsha, a densely

populated and impoverished area in Cape Town, faces a high risk due to limited access to early medical care. Established in 1995 by UCT’s Division of Obstetrics and Gynaecology in collaboration with Columbia University, the Khayelitsha Cervical Cancer Screening Project (KCCSP) has been crucial in combating cervical cancer in underserved communities, focusing on early detection and treatment to improve health outcomes for women in the region.

“In 2023, KCCSP screened **1 125** women and provided colposcopy care to **630** patients with abnormal results.”



## The Desmond Tutu Health Foundation

The Desmond Tutu Health Foundation (DTHF) is a non-profit organisation affiliated with the Desmond Tutu HIV Centre (DTHC) within UCT’s Department of Medicine. Together, they form a Centre of Excellence focusing on research, community engagement and resource development in the prevention and treatment of HIV/AIDS, TB and related infections. Operating across six research sites, DTHF is addressing key health challenges including adolescent health, sexually transmitted infections (STIs), and LGBTQIA+ health.

In 2023, DTHF recorded over

31 407	client engagements conducted
2 263	HIV tests conducted
7 293	STI tests conducted
3 271	Pregnancy tests conducted

**2023 projects include:**

**FastPrEP Project:** Adolescent girls, young women and men who have sex with men in Cape Town remain at disproportionately high risk of HIV infection. Supported by



the Bill & Melinda Gates Foundation, FastPrEP focuses on expanding HIV prevention strategies for these key populations. In 2023, the project introduced innovative prevention methods, including the dapivirine vaginal ring alongside oral PrEP. FastPrEP engaged 18 282 clients throughout the year, resulting in 9 189 oral PrEP initiations and 85 dapivirine ring initiations. The project continues to enhance its efforts to provide accessible and tailored HIV prevention solutions to high-risk communities.

**KiSS-TP Programme:** The KiSS-TP initiative aims to build HIV research and academic capacity within South Africa’s

historically disadvantaged universities, developing a critical mass of skilled HIV researchers. The programme includes divisions in the Eastern Cape and a specialised focus on LGBTQI+ health. In 2023, the DTHF LGBT+ Health Division, based at the Groote Schuur Hospital Clinical Research site, partnered with the KiSS-TP initiative to establish the LGBTQI+ Health Research Fellowship.

This fellowship aims to strengthen the research capacity of emerging HIV researchers, with a focus on sexual and gender minorities, contributing to a more inclusive and comprehensive approach to HIV research.

## The PACK Child Guide

The UCT Knowledge Translation Unit (KTU), in partnership with The Health Foundation of South Africa, developed the PACK Child Guide to support healthcare workers in managing childhood conditions. Building on the Integrated Management of Childhood Illnesses (IMCI) programme, this clinical tool enhances aediatric care at the primary level. Launched in November 2023 with the Western Cape Department of Health, PACK Child is available as a free eBook, accompanied by an online training course, to improve the delivery of comprehensive child healthcare in diverse and underresourced settings.

## Artificial Intelligence Research Unit (AIRU)

UCT’s AIRU is advancing AI technology in public health across Africa. In 2023, AIRU secured the DSI/ NRF-UCT SARCHI Research Chair in AI Systems, strengthening its leadership in AI-driven healthcare. Collaborating with Jembi Health Systems, AIRU the unit developed AI solutions using 3D digital twins to transform public health in low-resource settings. This work led to a 2023 position paper that explores the potential of AI and digital twins in improving health and well-being in low-resource African countries, focusing on public health emergency response, disease outbreak management, and epidemic control.





# SDG 4 QUALITY EDUCATION

UCT recognises the transformative role of education in individual and economic development. In 2023, the university continued expanding access to education by bringing learning opportunities directly to communities – in-person and digitally – empowering disadvantaged youth and fostering lifelong learning.

## Lifelong learning for all

In 2023, the UCT Centre for Extra-Mural Studies (EMS) continued its Saturday Summer School outreach programme, offering disadvantaged youth opportunities to help them rise above their economic and social circumstances. Held in Masiphumelele, a township in Cape Town, the programme provided practical short courses designed to enhance students' skills and support their transition into higher education or employment. In collaboration with the Denis Goldberg House of Hope, EMS also offered coding courses for senior high school learners and unemployed youth, reinforcing its commitment to lifelong learning for all.



## Improving the quality of basic education

UCT's Schools Improvement Initiative (SII), part of the Schools Development Unit (SDU), draws on the university's broader resources to support the Western Cape Education Department in enhancing education quality. In 2023, the SII expanded its focus to include workshops on additional subjects and held specialised workshops to address challenges like bullying and substance abuse within schools.

The SII also places students across UCT in partner schools for their professional learning modules. The SDU's Grade R Mathematics Project is expanding its efforts to enhance early childhood education in collaboration with the Gauteng Department of Education and JET Education Services.

In 2023, the following students were placed in partner schools:

130

Audiology students to conduct hearing screenings



70

students from occupational therapy, speech-language therapy, physiotherapy and audiology





Teaching the teachers

A key objective of SII is teacher professional development. In 2023, SII took 181 foundation phase subject advisors, departmental heads and lead teachers through four training-of-trainers (ToT) sessions. Additionally, 1 700 departmental heads participated in sessions on effective Grade R teaching strategies, with ongoing mentorship provided to enhance mathematics education.

## UCT 100UP Project

Led by the SDU, the 100UP Project addresses educational inequality by equipping learners from underserved communities with the academic and life skills needed for higher education. The programme focuses on broadening access to tertiary institutions, enabling successful participants to enter UCT or other universities of their choice.

In 2023:

200	Matriculants participated in the 100UP project
86%	Enrolled in tertiary institutions across South Africa
98%	100UP Grade 12 learners achieved a bachelor's pass in their final examinations, allowing them to apply for bachelor's degrees at university
40.9%	National average



## Early childhood development

UCT’s [Children’s Institute](#) collaborated with the local non-governmental organisation, True North, to examine the factors affecting the safety, participation and inclusion of young children in early learning programmes in the informal settlement of Vrygrond, Cape Town. A community advisory board was established to facilitate the co-creation of strategies for meaningful change in early childhood development (ECD). In 2023, this partnership resulted in an action plan that emphasised teacher training and the community coordination of ECD initiatives. Two safe play spaces were developed at the community centre and library, enabling ECD centres to book structured play sessions for children. Additionally, tools were created to empower parents in early learning, including a guide to help them select quality ECD centres.





## SDG 5 GENDER EQUALITY

Diversity and gender equality are central to UCT's Vision 2030 strategy, aiming to create a socially just, inclusive culture that mirrors South Africa's diverse demographic. UCT tackles gender inequality through focused efforts in research, scholarships, mentorship, and leadership development, fostering an equitable environment within the university and extending its impact to the broader community.

### Support for women in science, technology, engineering and mathematics (STEM)

UCT continues to support women pursuing degrees in the Faculty of Engineering and the Built Environment (EBE) by offering entrance scholarships. Recognising the gender disparity in engineering, where only 11% of engineers globally are women, these scholarships aim to encourage greater female participation in the field. In 2023, UCT awarded **25 scholarships**, each valued at **R60 000**, to promote gender diversity and empower women in STEM careers.





## Building a cohort of black women researchers in human evolution studies

The UCT Human Evolution Research Institute (HERI) is committed to addressing the underrepresentation of women, especially black women, in the field of human evolution. HERI supports women doctoral student through targeted programmes that offer financial assistance, mentoring and career development opportunities, promoting greater inclusion in this traditionally male-dominated discipline.

HERI also organises field camps for final-year geology and archaeology students, providing hands-on learning

“By 2050, Africa’s adolescent population is expected to reach half a billion, representing a significant yet untapped resource for the continent’s development.”

experiences that equip young women with essential field research skills while fostering supportive peer networks.

In 2023, HERI hosted the African Palaeoproteomics Workshop, gathering researchers from across Africa to build a pan-African network that nurtures emerging talent in the study of ancient biomolecules within human evolution research.

## Advancing sexual and reproductive health with the Genital Inflammation Test

The Genital Inflammation Test (GIFT), developed at UCT, focuses on detecting vaginal inflammation, a key factor in increasing HIV risk. GIFT is the focus of an international collaboration of almost exclusively female scientists led by Professor Jo-Ann Passmore and Dr Lindi Masson, members at UCT’s Institute of Infectious Disease and Molecular Medicine (IDM). This low-cost diagnostic tool is currently being validated with nearly 700 women in South Africa, Zimbabwe and Madagascar.

GIFT’s advanced technology identifies inflammation biomarkers at low concentrations, enabling early diagnosis of conditions like sexually transmitted infections (STIs) and bacterial vaginosis, which often go unnoticed but significantly elevate the risk of HIV transmission. The initiative benefits from strong collaborations with partners such as the Institut Pasteur de Madagascar and the Organisation for Public Health Interventions and Development in Zimbabwe.



With support from the Technology Innovation Agency (TIA) and the South African Medical Research Council (SAMRC), GIFT aims to commercialise a locally produced diagnostic tool tailored for resource-limited settings, making it accessible and affordable for those who need it most.

## Driving positive outcomes for adolescents in Africa

By 2050, Africa’s adolescent population is expected to reach half a billion, representing a significant yet untapped resource for the continent’s development. Without targeted support, many of these young people risk remaining trapped in cycles of poverty. The international collaborative Adolescent Accelerators Research Hub (AARHub), led from the University of Oxford’s Department of Social Policy and Intervention and UCT’s Centre for Social Science Research (CSSR), and funded by the United Kingdom

Research and Innovation (UKRI) Global Challenges Research Fund aims to shift this trajectory. Collaborating with interdisciplinary researchers, policymakers and NGOs, AARHub develops evidence-based, cost-effective interventions that empower African youth in resource-limited settings to realise their full potential.

One of AARHub’s flagship projects, hey baby, works with the largest cohort of adolescent mothers in the world. In 2023, the study entered a new phase, engaging 1 159 young women from the Eastern Cape who became mothers as adolescents, along with their 1 504 children. This phase focuses on the experiences of young mothers, exploring areas like sexual health, HIV, pregnancy, childbirth and child development, while also introducing tools like child assent booklets and cognitive assessments. The project made a notable impact at the 2023 Paediatric-Adolescent Treatment Africa Summit, engaging stakeholders on adolescent HIV care across 12 countries.



# SDG 6 CLEAN WATER AND SANITATION

Access to clean water is an increasingly critical issue in Africa, and UCT is committed to advancing sustainable water management both on campus and beyond. Through its research-driven initiatives, the university focuses on fostering a water-resilient mindset and implementing innovative, nature-based solutions to address water challenges. UCT promotes daily water conservation, provides free, safe drinking water across multiple outlets on campus, and embeds holistic water management principles to create a water-sensitive campus community.

## Khusela Ikamva: Creating a ‘no-drop-wasted’ campus

As part of the Khusela Ikamva sustainable campus initiative, UCT’s Future Water Institute is transforming the campus into a ‘no-drop-wasted’ environment. Using co-creation and a living laboratory model, this initiative integrates water-sensitive design principles into campus infrastructure, fostering a holistic approach to water management. These efforts aim to position UCT as a leader in sustainable

water management, creating a resilient and water-sensitive campus community.

In 2023, the project focused on:

- Utilising internet of things (IoT) technology to monitor water levels, rainfall and temperatures across campus.
- Profiling stormwater quality to explore opportunities for reuse.
- Developing a sustainability map and interactive tour to engage the UCT community in water conservation practices.
- Establishing multiple living labs across UCT, incorporating real-time data, monitored to support sustainable water initiatives.
- Launching a Khusela Ikamva interactive website in partnership with the Future Water Institute, African Climate and Development Initiative (ACDI), and the Environmental Sustainability Directorate in the Office of the Vice-Chancellor.
- Conducting social acceptance surveys and extensive stakeholder engagement to promote sustainable practices.
- Publishing research and hosting workshops to advance knowledge on water-sensitive urban design.

## Stormwater ponds for sustainable and water-resilient cities

In 2023, the Pathways to Water-Resilient South African Cities (PaWS) project, a collaboration between UCT’s Future Water Institute and the University of Copenhagen, expanded into PaWSII with additional funding from DANIDA MFA







(Danish government). Building on earlier work, the project now focuses on broadening the role of stormwater ponds beyond flood control to enhance water quality and support sustainable urban areas.

As part of the project, several co-creation and engagement activities were held with residents, including the painting of a large mural to tell the story of stormwater management and the design and planting of an indigenous knowledge garden to support local plant biodiversity on the site.

## Confluency colloquium

In June 2023, UCT's Future Water Institute, in partnership with the University of Toronto and supported by the Social Sciences and Humanities Research Council of Canada, hosted the Confluency Colloquium. This three-day event combined knowledge exchange with arts-based workshops to explore water justice. The resulting exhibition showcased diverse media, including comics, photo stories, murals and

“In 2023, it completed a comprehensive study on urban groundwater flows in Cape Town and Nelson Mandela Bay, using an urban water metabolism framework to model the impacts of climate change and land use on groundwater resources.”

string art, highlighting key themes from the colloquium. The exhibit was displayed at UCT's Centre for African Studies (CAS) gallery, the National Arts Festival in Makhanda, and later toured universities in Canada.

## GoFlow project

Led by UCT's African Climate and Development Initiative (ACDI) and funded by the Water Research Commission, the GoFlow project addresses groundwater management challenges in South African cities facing drought risks.

In 2023, it completed a comprehensive study on urban groundwater flows in Cape Town and Nelson Mandela Bay, using an urban water metabolism framework to model the impacts of climate change and land use on groundwater resources.

The project also facilitated collaborative learning labs to promote sustainable groundwater management strategies, culminating in an online learning event in 2023.





SDG 7

AFFORDABLE AND CLEAN ENERGY

South Africa’s dependence on coal has made it one of the world’s top greenhouse gas emitters, further exacerbated by an ongoing energy crisis. UCT is driving the transition to affordable, sustainable energy through capacity building and innovation, reducing the country’s carbon footprint and ensuring a resilient energy future.

Transforming Energy Access – Learning Partnership (TEA-LP)

The Transforming Energy Access – Learning Partnership (TEA-LP) project, led by the UCT African Climate and Development Initiative (ACDI), is a collaborative initiative aimed at building a skilled local workforce to lead the transition to sustainable energy access. In 2023, it expanded its network to 30 universities across Africa, South Asia and the Indo-Pacific, developing three new master’s courses on energy access. By integrating academic and professional training, TEA-LP builds long-term local capacity, promotes knowledge exchange and

strengthens a Global South network of expertise to tackle energy challenges worldwide.

Electric mobility driving clean energy innovation

UCT’s Environmental Sustainability Directorate is piloting an electric vehicle (EV) project as part of its living lab initiative, providing a platform to experiment with new technologies. A detailed technical feasibility study has also been conducted to explore the transition of the UCT shuttle service to an EV fleet, supporting informed decisions about fleet integration.

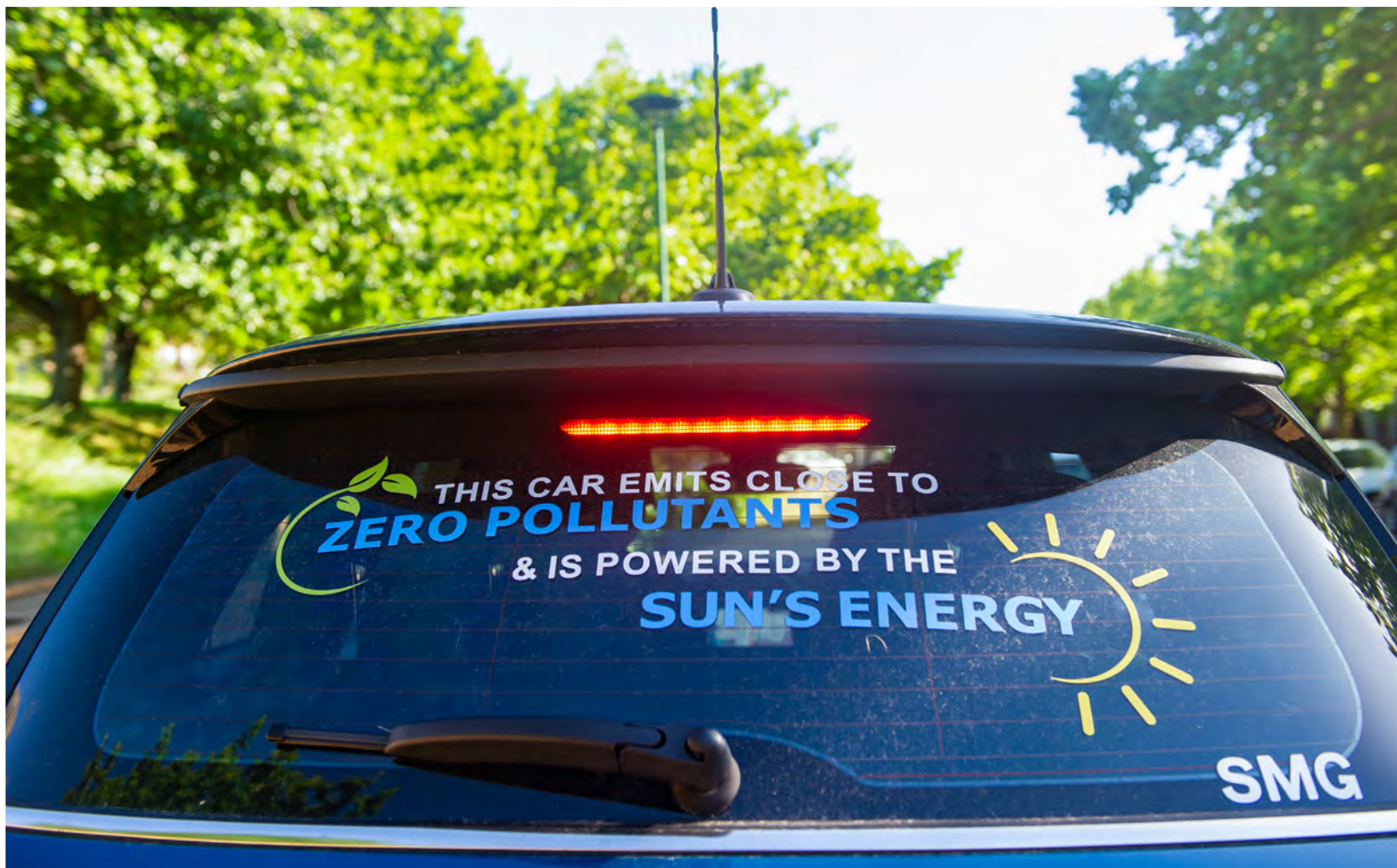
The initiative empowers students and staff to research EV operations, charging infrastructure, driver experiences and cost recovery methods – critical areas still underdeveloped in South Africa. These insights will guide the future deployment of EV charging stations on campus.

Another key innovation is a wireless charger with non-planar coils, developed by Dr Sampath Jayalath and doctoral student Nikhil Bejrajh from the Department of Electrical Engineering.

This charger is designed to address alignment challenges in conventional systems. Initially focused on e-scooters, it supports vertical docking, reducing the infrastructure footprint, which is critical in urban environments. With support from







UCT’s Innovation Builder Fund and uYilo Kickstarter funding, the team is developing a multi-vehicle docking station for e-scooters, with trials planned on campus.

## Energy Systems Research Group (ESRG)

Based at UCT, the Energy Systems Research Group (ESRG) is internationally recognised for its interdisciplinary work in

climate change mitigation and energy transition studies. By combining energy and economic system modelling with policy analysis, ESRG generates crucial insights into energy systems at the national and regional levels, focusing on South Africa and the Southern African Development Community (SADC) region.

ESRG provided scenario-based forecasts for the 2023 revision of South Africa’s Integrated Resource Plan (IRP), which guides electricity generation capacity planning.

The group also contributed to the Just Energy Transition Partnership (JET-P), estimating investment requirements for the country’s energy transition. Additionally, ESRG supported updates to the country’s Nationally Determined Contribution (NDC) under the Paris Agreement, using their hybrid energy-economic model (SATIMGE) to inform climate policy.

By working closely with government, industry and civil society, ESRG advances sustainable energy solutions and supports the transition to affordable, clean energy.

## Hydrogen Energy Application

Hydrogen Energy Application (HYENA), a UCT hard-tech spin-off, focuses on hydrogen-based power solutions as cleaner alternatives to traditional diesel generators. The company is preparing for field trials of its POWER POD technology, designed to provide scalable, reliable power in low-resource settings. As the industrial lead in the GreenQUEST consortium, HYENA is also developing renewable Liquefied petroleum gases (LPG) from captured carbon dioxide and green hydrogen, further enhancing the environmental benefits of its technology. HYENA’s approach integrates innovative energy solutions with existing LPG infrastructure, offering a sustainable alternative to diesel generators.







# SDG 8 DECENT WORK AND ECONOMIC GROWTH

South Africa has one of the highest rates of unemployment globally. UCT has research groups dedicated to exploring the dynamics of unemployment and the country's labour market, such as the [Development Policy Research Unit \(DPRU\)](#), which has a strong relationship with the government and policymakers to support evidence-informed policy in South Africa. UCT also supports the Just Transition, ensuring that economic sectors can shift toward sustainability without marginalising workers and communities dependent on carbon-heavy industries.

## Supporting and expanding South Africa's economy

In 2023, the DPRU in collaboration with Harvard University's GrowthLab [conducted research](#) on the socio-economic impacts of transitioning away from coal, particularly in Mpumalanga, where coal remains a major economic driver.





The study provided estimates of coal sector employment and examined labour market challenges.

## Temporary Employer–Employee Relief Scheme (TEERS)

DPRU’s 2023 study on the temporary employer-employee relief scheme (TEERS) assessed its role in job retention during the COVID-19 pandemic. Using panel labour force survey data,

the research found that the scheme increased the likelihood of retaining employment by 15.6%, suggesting that TERS saved 2.7 million jobs in the short-term during April and May 2020.

Core to the DPRU’s work was engagement with local government officials to understand the constraints on informal-sector activity and explore how appropriate regulatory reforms and policies could be used to encourage greater participation in the informal sector and support future job creation strategies.

## Labour Market Intelligence research programme

In 2023, the unit managed the Labour Market Intelligence (LMI) research programme, a government initiative supported by the Department of Higher Education and Training (DHET) and the National Skills Fund (NSF). This multi-year programme aims to create a credible institutional framework for skills planning in South Africa, integrating labour market data to build a capable workforce that supports inclusive economic growth.

The LMI research programme focuses on aligning the country’s education and training systems with employer needs, removing a lack of skills development as a barrier to economic growth, and informing policy and planning to better match education outcomes with labour market demands.

## National minimum wage

In 2023, the DPRU continued to provide research assistance to the National Wage Commission. The commission is tasked with recommending the annual national minimum wage adjustment to the Minister of Labour. The unit’s research uses nationally representative household survey data, provided by Statistics South Africa, to examine how an increase in the national minimum wage (NMW) impacts a few key outcomes for covered workers. This data-driven approach helps the commission understand the broader labour-market impacts of minimum-wage adjustments, ensuring that wage growth is balanced with economic sustainability. By equipping the commission with robust

evidence, the DPRU is helping shape fair and effective wage policies for South Africa.

## Supporting a just transition

### Pathways to climate resilience

UCT’s Climate System Analysis Group (CSAG) is playing a key role in South Africa’s just transition, which seeks to reduce greenhouse gas emissions while ensuring that workers and communities dependent on carbon-heavy industries are not left behind. In collaboration with the African Climate and Development Initiative (ACDI), CSAG co-developed a Climate Resilient Development Pathways (CRDP) framework commissioned by South Africa’s Presidential Climate Commission (PCC). In 2023, the framework was deployed, engaging South African officials through virtual learning sessions.

### A just urban transition

The African Centre for Cities (ACC) was commissioned by the World Bank, the National Treasury, and the PCC to draft a discussion paper on the Just Urban Transition. The report, Pathways for a Just Urban Transition in South Africa, was launched by the PCC in February 2023 and outlines how South Africa’s eight metropolitan municipalities can implement the just transition framework, with a focus on climate justice, improved service delivery, and sustainable urban development. ACC’s work is now in its second phase, implementing Just Urban Transition projects and programmes furthering work from its collaborative Cities Support Programme.



SDG 9

INDUSTRY, INNOVATION AND INFRASTRUCTURE

Universities serve as key drivers of innovation. When research results in protected and commercialised intellectual property, it generates widespread benefits, creating new industries, infrastructure and jobs.

Research Contracts & Innovation (RC&I)

The university’s RC&I office supports UCT innovators in protecting and patenting inventions and building spin-off companies to grow South Africa’s economy and competitiveness.

In 2023, the following outcomes were achieved:

3	new spin-off companies launched - Sleep Science (Pty) Ltd, Vas MedTech (Pty) Ltd and PeeCycling (Pty) Ltd (totalling 34 spin-offs since 2004)
6	new projects funded by the Innovation Building Fund
21	licenses issued
33	new invention disclosures received
35	new patent applications filed

MedTech healthcare innovation

UCT’s MedTech group, based in the Biomedical Research Centre, is reshaping healthcare with advanced

technologies focused on improving access to care in underserved communities.

The FlexiGyn device, co-developed by doctoral student Edmund Wessels and Professor Sudesh Sivarasu, won the 2023 Africa Prize for Engineering Innovation. FlexiGyn allows for gynaecological diagnosis and treatment without general anaesthesia, ensuring critical care is accessible in low-resource settings. This innovation has sparked partnerships with healthcare professionals across Africa, building a network committed to expanding screenings and healthcare services in remote areas.

UCT MedTech has also developed other transformative devices such as Easy Squeezy, a reusable asthma pump attachment that reduces activation force, fits a variety of pump sizes, and includes a dose counter—empowering children to manage their condition independently while reducing stigma through its child-friendly design. Another key innovation is the Activities of Daily Living (ADL) Arm, a 3D-printed below-elbow prosthetic optimised to assist trans-radial amputees with bimanual tasks. Unlike other open-source prosthetics, the ADL Arm is designed for real-world usability, with future enhancements planned through clinical trials and design updates.

UCT MedTech’s focus on collaborative innovation and open-source solutions establishes UCT as a leader in global medical technology. Through frugal bio design, it develops affordable, sustainable tools tailored for resource-limited settings, leveraging local expertise to address context-



specific healthcare challenges and reduce disparities in Africa and beyond.

Infrahub.Africa

The African Centre for Cities (ACC) is an interdisciplinary hub at UCT that conducts research into issues faced by cities in the Global South. One initiative, Infrahub. Africa, launched in May 2023, is a collaboration between UCT,



Utrecht University and Stellenbosch University’s Centre for Sustainability Transitions. This online platform showcases sustainable infrastructure projects across Africa, promoting equitable urban development. A key case study is the [Solar Public Lighting Initiative](#) in Khayelitsha, which installed 800 solar-powered lights, enhancing nighttime safety and community engagement in six informal settlements.

### Innovation for greywater solutions

In 2023, UCT’s NextGen Engineers team won the RS International Innovators Championship with their 3D-printed modular greywater filter, [GreyCycle](#), designed to address water scarcity in low-income communities. The system filters and recycles greywater for reuse in activities like laundry and agriculture. GreyCycle uses a simple, low-maintenance design with natural filtration materials to improve water quality. Field-tested in Cape Town’s Springfield township, it showed significant benefits for water-stressed areas.

The team plans to expand GreyCycle’s reach through further testing and partnerships, aiming to promote sustainable water usage in under-resourced communities.





SDG 10

REDUCED INEQUALITIES

South Africa continues to have some of the highest levels of inequality in the world, with racial inequality deeply rooted in its history, intersecting with other forms of marginalisation. UCT is committed to addressing these challenges, both within the university and in broader society.

Inclusive education for children with disabilities

UCT’s [Including Disability in Education in Africa \(IDEA\) Research Unit](#) was created to address the exclusion and poor-quality education of children with disabilities in South Africa. The unit engages in research, networking and training to strengthen inclusive education for learners with disabilities.

In 2023, the [Lego Foundation](#) awarded IDEA a tender to assess the feasibility of implementing Lego Braille Bricks for visually impaired learners in South Africa. The project includes training educators and evaluating government support. In collaboration with Special Olympics International (SOI), IDEA also conducted a study on the employment impact of unified leadership training for people with intellectual disabilities.



IDEA published the online textbook [Disability Studies in Inclusive Education](#) to further support educators with practical tools for creating accessible learning environments.

Accelerating transformation

Launched in 2021 with funding provided through the Office of the Deputy Vice-Chancellor: Transformation, the UCT [Accelerated Transformation of the Academic Programme \(ATAP\)](#) addresses the underrepresentation of black South African academics by building a pipeline of high-performing postgraduates and early-career scholars. The programme provides funding, mentorship and capacity development, including research skills training,

teaching preparation, and support for conference travel, to prepare scholars for academic careers.

In 2023, [ATAP welcomed](#) three master’s students, four doctoral students and one postdoctoral researcher, bringing together awardees from all three cohorts for the first time. Through targeted mentorship and development, ATAP plays a vital role in fostering a more diverse and inclusive academic community.

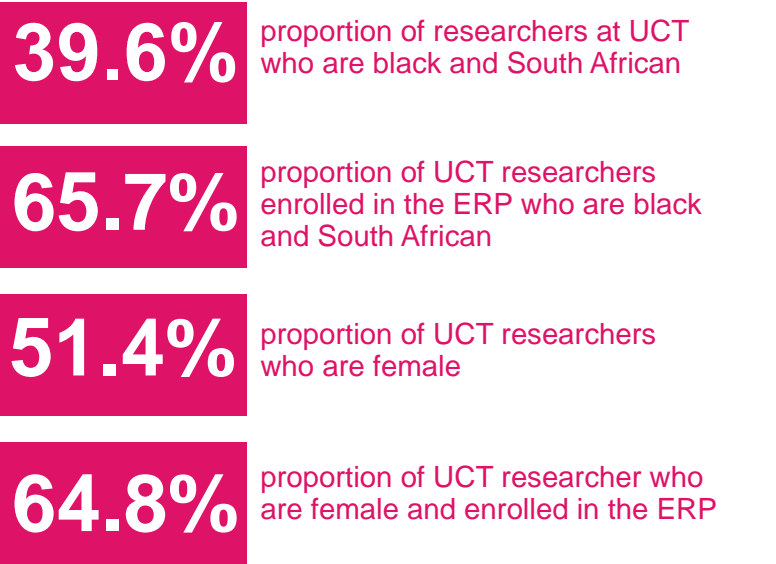
Supporting emerging researchers

Since its inception in 2003, the [Emerging Researcher Programme \(ERP\)](#) has played a pivotal role in supporting

early-career academics at UCT to grow their research, enhance their productivity and provide an enabling environment that contributes to transformation and retention. A key contributor to reducing inequalities and transformation, the ERP has successfully attracted and supported a larger proportion of women and black South African researchers than reflected in the overall researcher demographics at UCT. In 2023, the programme welcomed 51 new members. Additionally, 67 of the 124 academics who received a promotion in 2023 were ERP members at some stage in their career.

Reducing racial and gender inequality

Data collected in 2023 shows the effectiveness of the ERP in reducing racial inequality among academics at UCT:





## STEM outreach and e-Mobility at Portland High School

In 2023, with the aim of reducing inequality in the uptake of science, technology, engineering and mathematics (STEM) subjects at university, a team from the Department of Electrical Engineering led a two-day STEM outreach programme at Portland High School in Mitchells Plain, focusing on the practical and theoretical aspects of sustainability and electromobility. The program highlighted the role of these fields in building a cleaner future and was led by master's student Kai Goodall, Associate Professor David Oyedokun and Muhammad Aadil Eyasim with support from UCT student volunteers.

The team showcased Goodall's AI -solar-powered car, HeliosRover, a self-driving car capable of autonomous navigation through road lanes, and Eyasim's MercuryRover, a high-speed AI car with traffic light and stop-sign detection. Students also explored an electric scooter and an electrically powered MINI Cooper.

Participants gained hands-on experience building solar-powered alarm systems and learned practical renewable energy applications, with 14 robotics kits donated by RS South Africa.

The event also launched the school's STEM Club, which received two Arduino kits.

Learners explored the connection between solar energy and e-mobility, the skills needed to enter the field and the



importance of pursuing STEM subjects. This initiative is part of the department's socially responsive programme, linking UCT's research with direct community impact.

## Understanding how continental and global inequalities can be overcome

The African Centre of Excellence for Inequality Research (ACEIR), led by UCT as part of the African Research Universities Alliance (ARUA), marked its fifth year in 2023. ACEIR focuses on generating a multidimensional understanding of inequality, poverty and deprivation across Africa.

The centre co-hosted an international conference on inequality, work and nature, in collaboration with the Agence Française de Développement (AFD), the European Union and the South African Presidency. The event gathered over 150 researchers, government officials and civil society practitioners to discuss research aimed at informing sustainable, long-term development policies.

ACEIR also co-hosted the 31st International Association for Feminist Economics with the International Food Policy Research Institute, which included a pre-conference mentoring workshop.

In 2023, their work was included in the following publications:



A social perspective on  
The Socio-Economic Dimensions Of Racial Inequality In South Africa

Fiscal Interventions and Welfare in Ghana: A CEQ Assessment using Ghana Living Standards Survey

### Policy Brief

October 2023

**Fiscal Interventions and Welfare in Ghana: A CEQ Assessment using Ghana Living Standards Survey (round 7)**

Authors: Dariusz Matusz, Richmond Atta-Ankomah, Robert Darko Osei, Isaac Osei Akpan

#### Introduction

Ghana experienced a relatively high and steady economic growth of over 6% on average from 2005 to 2017 (World Development Indicators, 2022). However, the benefits from this high growth have not been equally distributed (Ankomah et al., 2020; GSS, 2018; Coker, Hagan, and McKay, 2016). This situation has the potential to undermine the extent of poverty reduction and welfare improvement that could result from the high economic growth (GSS, 2018). Indeed, the trend in poverty rates shows a declining rate of poverty reduction while inequality has been rising (GSS, 2018; Ankomah et al., 2020).

The fact that any government is a major (or the most important) agent in ensuring that economic growth yields significant welfare gains in terms of improvement in income distribution and poverty reduction cannot be overemphasised. This is because governments exert enormous control in any economy particularly through fiscal (tax and spending) policy measures. The nature of these policy measures can undermine inclusive growth and can directly or indirectly lead to major changes in welfare outcomes both in the short and long term (Fradette et al., 2014; Luning, 2016; Aguilera et al., 2017). This brings to the fore the need to investigate in a comprehensive manner, the extent to which various government's spending and taxation instruments independently or together impact on poverty and inequality. An analysis such as is done in this study, provides evidence on key factors that promote or limit the redistribution and poverty reduction effect of government's fiscal. Ultimately, the evidence from this analysis can be utilised to ensure that government's policy decisions and interventions are not only efficient and effective but also prioritise equity across the various population segments within the country.

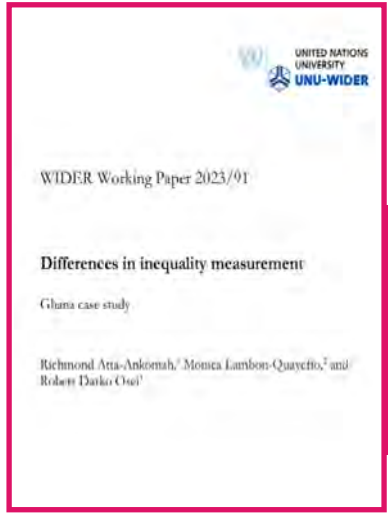
By applying the Commitment to Equity (CEQ) framework for incidence analysis of government fiscal, developed by the CEQ Institute, this study examines and quantifies the extent to which a range of taxes (both direct and indirect), government subsidies and social spending affect poverty and inequality in Ghana. In particular, this study sheds light on three important issues, namely: (1) How much income redistribution and poverty reduction were accomplished in 2016/17 through fiscal policy? (2) How pro-poor were specific taxes and government spending in 2016/17? (3) To what extent do recent fiscal reforms programmes like the free secondary school policy (Free SHS policy) and the COVID-19 relief interventions on electricity and water impact poverty and inequality?

#### Methodology

The analysis in this study follows the CEQ assessment framework, developed by the CEQ Institute and presented in the CEQ Handbook (Luning, 2016). Unlike other approaches for fiscal incidence analysis which are only amenable for conducting incidence analysis for a specific tax or expenditure, the CEQ assessment framework can accommodate as many fiscal policy elements as possible at the same time and provide a comprehensive analysis of their redistributive impact (Luning, 2016). This is made possible by offering the benefits from the various fiscal interventions and government programmes to individuals and households defined in a micro-level socio-economic survey and comparing various income concepts in the CEQ building blocks of fiscal incidence analysis.

The CEQ approach deals with several income concepts beginning with market income. Each successive income concept is generated by adding or subtracting an element of the fiscal system in a stepwise manner, and after each step, the measures of poverty, inequality and progressivity are computed to determine the influence of the relevant fiscal instrument(s) on welfare as well as the incidence of the policy instrument(s). The concepts are defined or derived as follows:

- **Market income** includes all earned and unearned income before government transfers and receipts from contributory pensions; then, it is income before any government influence through taxes and expenditures.
- **Net market income** refers to the cash income available after the government has deducted direct



Working paper on the Differences in inequality measurement





# SDG 11

## SUSTAINABLE CITIES AND COMMUNITIES

Africa is the fastest urbanising continent, with rapid urban growth posing significant challenges and opportunities. Ensuring that cities are sustainable, safe and resilient in the face of climate change is critical. UCT contributes to this mission through various projects aimed at addressing urban challenges, climate resilience and preserving Africa’s rich cultural heritage.

### Supporting sustainable urban infrastructure

The African Centre for Cities (ACC) is an interdisciplinary hub at UCT that conducts meaningful research on how to understand and address urban crises in the Global South. Since most urban challenges – for example, food security, climate change adaptation, economic inclusion, cultural vitality and tolerance – are inherently interdisciplinary and spatially layered, ACC nurtures the co-production of knowledge between academia and other social sectors.





## Prediction, emergence, adoption and knowledge urban partnership

ACC was one of five partners in the Prediction, Emergence, Adoption and Knowledge (PEAK) Urban global partnership, funded by the United Kingdom Research and Innovation Global Challenges Research Fund (UKRI GCRF) which identifies the proactive policies and interventions that can produce an efficient, productive, inclusive and sustainable urban future. In Cape Town, the project investigated the data and knowledge registers mobilised by the city for the localisation and implementation of SDGs. This work led to a [webinar](#) co-organised with the International Science Council and the ACC to launch the book on *Localizing the SDGs in African Cities* in May 2023, where stakeholders explored practical experiences of how the SDGs can be adapted to and implemented at the local level in ways that contribute to sustainable urbanisation.

## Beyond the Networked City project

The [Beyond the Networked City project](#), funded by the Economic and Social Research Council (ESRC) in collaboration with the ACC, the University of Bristol, Loughborough University, Sierra Leone Urban Resource Centre and Makerere University, focuses on improving infrastructure works and service delivery in African cities. In 2023, the project explored how a mixed model of on-grid and off-grid systems can enhance the provision of sustainable water, sanitation and energy services in marginalised communities in Freetown (Sierra Leone) and Kampala (Uganda). By working with local stakeholders, government and development agencies, the project highlights innovative off-grid technologies to ensure access to clean water, sanitation and affordable energy in underserved urban areas.

## Preserving African musical heritage

Now in its 21st volume, the *Journal of the Musical Arts in Africa (JMAA)*, published by SACM, bridges oral and written traditions, promoting African musical heritage through peer-reviewed research and compositions. It advances African scholarship and preserves socio-cultural transformations, fostering resilient, inclusive communities.

In 2023, the JMAA was featured at the 47th World Conference of the International Council for Traditional Music in Ghana, where SACM staff launched Volume 19, focused on African

music theory and aesthetics. During the Nketia Memorial Concert, JMAA presented copies of this special edition to the J.H. Kwabena Nketia Archives at the University of Ghana, further promoting African scholarship.

## d-school Afrika\* and green building excellence

UCT's Hasso Plattner School of Design Thinking Afrika\* (d-school Afrika\*) received [multiple accolades](#) in 2023 for its innovative and sustainable building design, including a

6-Star Green Star Design rating from the Green Building Council of South Africa (GBCSA). As the first academic building on the continent to receive this rating, the d-school Afrika\* sets a new benchmark in environmental sustainability. The building features rooftop solar panels, rainwater harvesting systems, low-energy lighting and electric vehicle charging points.

These green initiatives support UCT's goal of becoming a net-zero carbon campus by 2050, aligned with the university's Environmental Sustainability Strategy and Vision 2030.





# SDG 12 RESPONSIBLE CONSUMPTION AND PRODUCTION

UCT continues to promote responsible consumption and production through innovative research, sustainable practices and interdisciplinary collaborations that reduce environmental impact.

## Decarbonising concrete production

The Department of Civil Engineering has conducted extensive research on the deterioration of marine concrete structures and methods to extend their lifespan. Emeritus Professor Mark Alexander has contributed significantly to this area, also collaborating with Professor Sabbie Miller on critical issues for a United Nations Environment Programme (UNEP) report on low-carbon cement initiatives.

In 2023, Alexander co-authored a [paper](#) showing how emissions from global concrete production can be reduced

by improving material efficiency. The study demonstrated that cement demand could be lowered by up to 65%. These methods contribute to climate mitigation without requiring substantial investments in alternative manufacturing or materials offering a practical approach to decarbonising concrete production while enhancing resource efficiency and sustainability.

**“The study demonstrated that cement demand could be lowered by up to 65%. These methods contribute to climate mitigation without requiring substantial investments.”**



## Contributions to sustainable consumption and production

For over 25 years, Professor Harro von Blottnitz of the Department of Chemical Engineering has advanced research on sustainable consumption and production. In 2023, he co-authored a [study](#) on cleaner production technologies in South Africa’s ferrochrome sector, showing reduced energy use and a symbiotic relationship with the platinum-group metals industry. His [lifecycle carbon footprint analysis](#) quantified the global warming potential of the plastics industry and won the South African Journal of Science’s best paper prize.

Collaborating with material flow experts from the University of Natural Resources and Life Sciences, Vienna, Von Blottnitz contributed to the first-ever [circularity assessment](#) of the full South African economy, highlighting the urgent need for more sustainable resource management across the economy.

## Khusela Ikamva: Integrated food-water-energy system

Launched in 2022, the [Khusela Ikamva project](#) seeks to develop a campus-wide, integrated food–water–energy



system using anaerobic digestion of organic waste. Led by the Centre for Bioprocess Engineering Research (CeBER), the project converts food waste into renewable energy (biogas), fit-for-purpose water and fertilisers. These products are used to power campus kitchens and maintain UCT's grounds through sustainable irrigation.

In 2023, the Khusela Ikamva project introduced algae scrubbers to remove carbon dioxide during the digestion process, producing biofuels and valuable bioproducts like natural pigments. The nutrient-rich effluent is used in aeroponic systems to support sustainable landscaping. The project also integrates vertical green walls, which help reduce energy consumption while cooling campus buildings.

Khusela Ikamva also serves as a living laboratory for UCT staff and students, offering hands-on learning in sustainable waste management and circular design thinking, supporting UCT's sustainability goals by transforming waste into valuable resources.

## Sustainable photography

An eco-conscious project at UCT's Michaelis School of Fine Art is leading the way in reducing the environmental impact of traditional photographic practices. The [Sustainable Photographic Garden](#), located on UCT's Hiddingh Campus, is dedicated to exploring and implementing aims to fast-track research in the field of sustainable photographic practices and cultivate a sense of environmental consciousness and agency among students and staff on campus.

Traditional darkroom photography relies heavily on silver-based processes, which are harmful to the environment



due to the toxic chemicals involved. The photographic garden at UCT serves as a research and teaching space where alternative, sustainable photographic techniques are explored and developed.

The garden's primary purpose is to gather and produce plant material for lumen prints (a simple way to make an image with

the sun), anthotypes (an image created using photosensitive material from plants) and phytograms (an image created using the internal chemistry of plants to create visible chemical traces and marks on the photographic emulsion).

The garden is also used for water recycling and as a communal space for students and staff.



# SDG 13 CLIMATE CHANGE

Climate change affects all aspects of life, with varying impact across regions. Africa is the most vulnerable region to its effects, facing disproportionate challenges. Addressing these challenges requires robust research, strategic planning and collaborative, localised responses. UCT plays a leading role in advancing climate resilience across Africa by integrating research, education and policy and working closely with communities and governments to drive evidence-based climate action.

## Community of practice in climate research

Launched in 2023, the Community of Practice (CoP) in Climate Research, led by Professor Bruce Hewitson in the UCT Climate System Analysis Group (CSAG), in partnership with Stellenbosch University and the University of the Witwatersrand, addresses gaps between climate research and practical decision-making, particularly in managing uncertainties in climate projections. While cities play a crucial role in climate mitigation and adaptation, decision-makers



often need more tailored, actionable and easy-to-understand information than is currently available.

Funded by the National Research Foundation (NRF), CoP works with municipal officials in Cape Town, eThekweni and Johannesburg to address challenges such as fresh water supply, wastewater management and infrastructure resilience. This collaboration ensures that scientific insights are translated into practical solutions, supporting climate risk management and informed planning at the city level.

Activities such as the CSAG Short Course on Navigating Climate Risk equip city officials with tools to integrate climate science into decision-making processes. CoP currently supports five students, building future expertise and leadership in climate research. Upcoming activities include a progress review meeting to evaluate outcomes and guide future initiatives, helping cities develop effective responses to climate challenges.

## Digital library for climate change and sustainability education

The Climate Change and Sustainability Education Digital Library (CCSDL), developed by UCT's Schools Development Unit (SDU), is part of the Keep It Cool Climate Change Education (KIC: CCE) project. The project is implemented by VVOB Education for Development (VVOB) and GreenMatter, in partnership with Fundisa for Change, and funded by the government of Flanders. The CCSDL provides open educational resources (OERs) to enhance climate and sustainability knowledge for teacher educators and practitioners.





Built on the Ibalì platform by UCT’s [Digital Library Services](#), the CCSDL Library connects educators with resources supporting curriculum-based climate projects. It is linked with existing teacher training resources, educational platforms, and climate

programmes. These include the Intermediate Phase Natural Sciences Education for Sustainable Development [course](#), [Fundisa for Change Teacher Training](#), the UCT African Climate and Development Initiative (ACDI), the Western

“ASCEND is the world’s first synthesis centre focused on climate change and development.”

Cape Education Department, and the Rhodes University Environmental Learning and Research Centre (ELRC).

The CCSDL has reached 100 secondary schools, engaging students and communities in climate action to build resilience. Since launching in 2021, the library has been featured in 2 023 workshops involving over 1 000 teachers.

The ELRC, along with the University of Venda, the University of KwaZulu-Natal, the University of Zululand and the University of Fort Hare, participated in the KIC: CCE project. This collaboration ensures educators have access to tools and resources needed to drive sustainable change in schools and communities. Since its launch in 2021, the site has received over 51 000 unique views.

### African synthesis centre for climate change

Launched in November 2023 and hosted by the UCT African Climate and Development Initiative (ACDI), the [African Synthesis Centre for Climate Change, Environment and Development \(ASCEND\)](#) is the world’s first synthesis centre focused on climate change and development, with a strong emphasis on the Global South. The centre provides a platform for transdisciplinary teams of researchers, policymakers and

practitioners to collaborate, synthesise existing data and generate actionable solutions for climate-resilient development, prioritising the well-being of people and ecosystems.

Established with support from various international bodies, ASCEND’s flagship initiative, the BAOBAB Synthesis Project, will fund up to six African-led teams over three years. Each team will include a postdoctoral researcher based at UCT. These teams, drawn from policy, research and practitioner backgrounds across Africa, will address key climate challenges and contribute to building long-term climate resilience on the continent.





# SDG 14 LIFE BELOW WATER

Oceans are crucial for human health and well-being, as well as the sustainability of the planet. Unfortunately, the health of our interconnected oceans and freshwater systems is under threat. UCT is increasingly taking a global leadership role in ocean observations to monitor the health of aquatic ecosystems in southern Africa. On campus, UCT strives towards sustainable water management practices and aims to foster a water-wise community through water-sensitive waste disposal and an action plan for proper plastic disposal on campus.

## Keeping oceans and people healthy

Plastic pollution poses a serious threat to marine ecosystems, entangling and being ingested by aquatic species. The [FitzPatrick Institute of African Ornithology](#), based in the Faculty of Science, has been documenting the impact of plastics on seabirds since the 1980s.

While plastic pollution is a global issue, most marine litter in South Africa and the Global South originates locally, stressing the need for targeted local solutions. The institute pioneered

the use of plastic bottles as tracers of marine litter, a method now adopted by research teams worldwide. Their research uncovered [illegal dumping](#) of Polyethylene terephthalate (PET) bottles from ships, particularly from Asia, while lighter polymers such as High-density polyethylene (HDPE) and Polypropylene (PP) drift long distances from land-based sources.

In 2023, doctoral candidate Vonica Perold analysed several long-term datasets on seabird ingestion, showing

increases in some species but not others over the last three to four decades. This surprising outcome reflects complex interactions between wildlife and plastic waste, despite the continuous rise in global plastic production.

In the same year, doctoral student Kyle Maclean expanded his research on litter interception devices in Cape Town to explore the social factors driving littering, offering insights for more effective interventions.

Beyond research, the FitzPatrick Institute provides world-class conservation education through its coursework-based master's programme in conservation biology. In 2023, 24 students graduated from the programme, which admits 12–14 students annually and attracts participants from across Africa and beyond. Many graduates go on to play vital roles in biodiversity conservation and ecosystem resilience efforts across the continent and internationally.

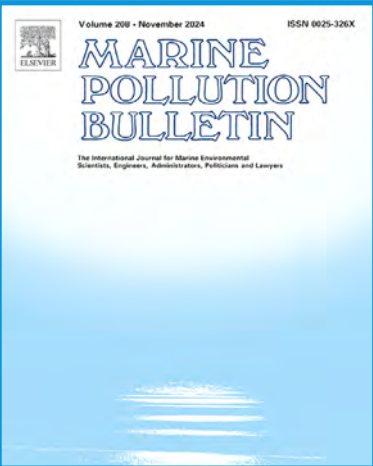


“While plastic pollution is a global issue, most marine litter in South Africa and the Global South originates locally, stressing the need for targeted local solutions.”

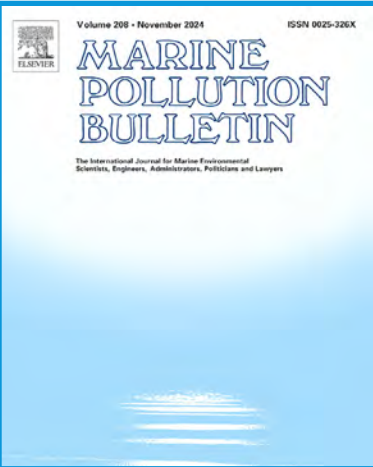


## Knowledge contributions

In 2023 the work on plastics influenced several research publications, including:



Illegal dumping from ships is responsible for most drink bottle litter even far from shipping lanes



Abundance and composition of small floating plastics in the eastern and southern sectors of the Atlantic Ocean



Understanding the sources of marine litter in remote islands: The Galapagos islands as a case study



Global assessment of marine plastic exposure risk for oceanic birds

## Southern Ocean marine predator ecology

Chinstrap penguins play a critical role in the Southern Ocean ecosystem by consuming large amounts of Antarctic krill, a key species also targeted by commercial fisheries. Understanding the predator-prey dynamics between penguins and krill is essential for ecosystem-based fisheries management, which seeks to balance conservation efforts with sustainable harvesting.

In 2023, UCT researchers, including postdoctoral researcher Stefan Schoombie, developed a machine learning method using animal-borne sensors to monitor penguin prey capture. This method tracks diving depth and body movement, allowing accurate detection of prey captures without relying on video footage. The innovation enables long-term monitoring of penguin foraging patterns, helping assess the impact of fishing activities and climate change on krill availability. South Africa, as part of the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR), will apply these insights to set sustainable krill catch limits aligned with ecosystem needs.

Building on this research, UCT, in collaboration with the African Institute for Mathematical Sciences (AIMS) and Nelson Mandela University, is further refining non-invasive monitoring techniques. These methods offer deeper insights into penguin foraging patterns, strengthening policies for sustainable krill fishing and ecosystem management in the Southern Ocean.







# SDG 15 LIFE ON LAND

Environmental sustainability is central to UCT, with ongoing efforts to promote conservation and sustainable coexistence with nature. As a living laboratory, UCT empowers researchers and students to develop innovative solutions that advance biodiversity conservation and ecological resilience.



## Honeyguide research project

The Honeyguide research project, led by Claire Spottiswoode at the FitzPatrick Institute of African Ornithology, investigates the unique mutualism between greater honeyguides and human honey-hunters across Africa. Honeyguides lead humans to bees' nests seeking wax, while humans harvest honey by subduing the bees. This co-evolved relationship provides a model for studying the ecology and evolution of mutualism and the variation in human--wildlife interactions across different cultures.

Since 2013, Spottiswoode and her team have conducted research in the Niassa Special Reserve, Mozambique, in partnership with the Mbamba community and the Mariri Environmental Centre. Their work focuses on the reciprocal communication between humans and honeyguides. For example, Yao honey-hunters in Mozambique attract honeyguides with a specific call that has been shown to increase cooperation.

Activities in 2023 included multiple field trips to the Niassa Reserve, led by Spottiswoode and collaborators, to explore how honeyguide-human interactions affect pollination and fire regimes. New field experiments were also launched in Tanzania, focusing on pollination services related to this mutualism.

Since 2022, they have been documenting honey-hunting cultures in over 10 African countries as part of a collaborative effort led by a UCT postdoctoral researcher and funded by a Cultural Evolution Society Transformation Grant.







The citizen science project [Honeyguiding.me](#) continues to gather records of greater honeyguides, map changes in guiding behaviour, and uncover how honeyguides develop cooperative skills with humans.

### Hot Birds research project

The [Hot Birds research project](#), led by Associate Professor Susie Cunningham, investigates the impact of climate change on bird species across southern Africa and beyond. In 2023, the project identified key insights into how birds adapt to extreme temperatures. Research in the Kalahari revealed that Sparrow Weavers in shaded environments forage more efficiently and experience less heat stress, highlighting the importance of habitat structure. Studies on Fork-tailed Drongos found that hydration, not energy, limits activity during hot conditions, with birds continuing to forage for water despite heat stress. Further work in the Kalahari showed that mistletoes, although cooler than surrounding vegetation, serve primarily as foraging resources rather than thermal refuges.

The team also published a [2023 vulnerability assessment](#) of 241 arid-zone bird species, offering critical insights for conservation planning. They found that cooperation among animals influences breeding success in harsh climates, with outcomes linked to the energy invested in reproduction.

New tracking studies on Secretarybirds were launched in 2023 to investigate how warming temperatures affect nestling development, parental care and post-fledging survival. The project will expand to Marion Island to study the impact of climate change on surface-nesting seabirds.



### A platform for African biodiversity data

The Virtual Museum, developed through a collaboration between the FitzPatrick Institute and the Biodiversity and Development Institute, is a citizen science-driven biodiversity database with over 2.2 million records. Originally launched in 2005 to support the Southern African Reptile Conservation Assessment (SARCA), the Virtual Museum has since expanded to encompass 17 biodiversity sections, enabling public contributions to species distribution data across Africa.

This unique platform collects photographic records with metadata such as date, location and observer details, providing essential biodiversity information that complements traditional museum specimens. Unlike physical specimens, Virtual Museum records capture habitat context and species behaviour without degrading over time, enhancing ecological understanding.

In 2023, the [museum demonstrated](#) its continued value, with data contributing to biodiversity conservation initiatives and research efforts across Africa. The platform empowers citizen scientists and professional researchers alike, ensuring everyone can participate in biodiversity mapping. With built-in tools guiding contributors to areas where data is lacking, the Virtual Museum strengthens efforts to update species distribution maps – critical for effective conservation planning.

The platform exemplifies how public engagement and open data can drive sustainable biodiversity management, offering insights to protect Africa’s rich ecological heritage.





# SDG 16

## PEACE, JUSTICE AND STRONG INSTITUTIONS

UCT provides a neutral, inclusive space for open dialogue, bringing together thinkers and speakers from diverse political backgrounds to address South Africa’s challenges. In line with its Vision 2030 to advance knowledge in, for, and from Africa, UCT actively supports democratic institutions and fosters good governance across South Africa and the continent.

## Working towards achieving access to justice

The UCT Democratic Governance and Rights Unit (DGRU) works towards achieving access to justice and fair, accountable, independent and transparent judiciaries and justice systems in Africa. This is done through three main pillars of work: research and advocacy, ongoing professional development of judges and free access to the law.



## Judicial Institute for Africa

Ongoing professional development for judges is essential to maintaining competence, ethical standards and awareness of legal and societal developments. Since 2016, the Judicial Institute for Africa (JIFA) has provided UCT-certified short courses for judges across Africa, developed in collaboration with academics and subject matter experts. In 2023, JIFA expanded its offerings with the launch of a Postgraduate Diploma (PGDip) in Judicial Studies.

In 2023, numerous professional development courses were provided:

310	judges completed short courses
10	judges completed their first year of the PGDip

## Judges Matter

Judges Matter is a unit within the DGRU committed to fostering transparency, accountability and excellence within South Africa’s judiciary. Part of its work involves building public awareness of judicial appointments by publishing profiles of judicial candidates and making public the processes of the Judicial Services Commission (JSC) which is responsible for appointing judges in South Africa.

### In 2023, the DGRU:

- Monitored and publicised a judicial conduct tribunal on corruption.
- Published a report highlighting public trust in lower courts.
- Advocated for women’s leadership, resulting in five new female judicial heads, including the chief justice.
- Highlighted the shortage of judges, prompting government action.
- Conducted over 200 media engagements to defend judicial independence and promote public awareness.

## South Africa’s first youth violence-prevention centre

In 2023, UCT initiated the establishment of South Africa’s first youth violence-prevention centre, an initiative led by student and community activist Zukile Ntentema. The centre, based at UCT, will collaborate with government, law enforcement and civil society to monitor crime trends and develop targeted strategies to address youth violence in Cape Town.

The centre’s core activities will focus on developing Afrocentric, evidence-based interventions tailored to local contexts, emphasising African values, experiences and cultures. It will partner with NGOs, community policing forums and other stakeholders to identify effective practices and design new solutions for safer communities.

The initiative also aims to serve as a collaborative space for students, academics and volunteers to share resources and ideas, track progress and guide policy development. With partnerships already established with the South African Police Services youth desk, the Western Cape Government and the City of Cape Town, the centre will contribute to creating rigorously evaluated interventions that inform future government policies.





# SDG 17 PARTNERSHIPS FOR THE GOALS

With extensive networks across Africa and beyond, UCT plays a crucial role in connecting partners from the Global South and Global North to share knowledge and foster collaborative solutions for sustainable development. Through partnerships with governments, civil society, academia and the private sector, UCT actively contributes to addressing global challenges.

## Strengthening mayoral leadership

In January 2023, the African Centre for Cities (ACC) launched the African Mayoral Leadership Initiative (AMALI), bringing together 15 mayors and governors from eight African countries at the inaugural AMALI City Leadership Forum in Cape Town. AMALI provides city leaders with tailored support to transform their cities through three core programmes: the City Leadership Forum, the Urban Governance Research Lab and the Data Programme.

Through direct coaching, technical support and research-driven training, the initiative equips city leaders to implement innovative solutions that drive urban transformation. AMALI

is a partnership between ACC, Big Win Philanthropy and Bloomberg Philanthropies.

## Supporting climate action for the Paris Agreement

In September 2023, Professor Harald Winkler, from the School of Economics, co-facilitated the technical dialogue of the Global Stocktake (GST) on implementing the Paris Agreement. This comprehensive report provides a scientific foundation for political negotiations at United Nations Climate Change Conference (COP28) in Dubai, set for December 2023.

The GST report revealed that while progress has been made since the Paris Agreement, more ambitious targets and faster implementation are essential. It emphasised the need for system-wide transformations across the energy, land, water and health sectors and stressed the importance of equity and inclusion in these transitions.

Winkler highlighted that the report offers actionable solutions and best practices, but urgent action is needed to close the gap between commitments and outcomes. He noted the importance of aligning financial flows with low-emission development and addressing loss and damage through increased support for vulnerable countries. The report's findings will guide the next round of Nationally Determined Contributions (NDCs) and inform high-level discussions on future climate action at COP28.

Through these diverse partnerships and collaborative efforts, UCT exemplifies its commitment to sustainable development



by advancing knowledge, fostering global collaboration and building strong networks to address critical challenges.

## South-South partnership establishes Knowledge Translation Unit in Brazil

In 2023, UCT's Knowledge Translation Unit (KTU) helped establish the Unidade de Tradução de Conhecimento (UTC) in Brazil, housed at the Fiocruz Foundation. This initiative follows the successful pilot of KTU's Practical Approach to Care Kit (PACK) in Brazil, which equips primary healthcare

workers with tools to diagnose and manage 40 symptoms and 20 conditions, including HIV/AIDS, TB and mental health.

The formation of UTC ensures PACK is adapted to the Brazilian context and implemented across key municipalities, creating hubs for future regional expansion. The initiative exemplifies the benefits of South-South partnerships by enhancing healthcare delivery through shared expertise and resources.

Through these diverse partnerships and collaborative efforts, UCT advances sustainable development by fostering collaboration, sharing knowledge and building strong networks to address critical challenges.





## Africa charter transforming research collaborations

In 2023, the [Africa Charter for Transformative Research Collaborations \(ACTRC\)](#) was launched at the Association of African Universities' biennial conference in Windhoek, Namibia. The charter, developed to promote equitable research collaborations between Africa and the Global North, received 84 signatories at its launch.

ACTRC introduces a framework that emphasises equitable partnerships with guiding principles, measures of success

and accountability. Supporters of the charter include leading African and global universities, networks like the African Research Universities Alliance (ARUA), funders like the United Kingdom Research and Innovation (UKRI) and institutions such as the African Academy of Science (AAU).

The charter challenges existing power imbalances in global research by advocating for collaborative partnerships that recognise African knowledge systems and ensure local involvement throughout the research process. A secretariat, formed by UCT, the University of South Africa, and the University of Bristol, will coordinate the initiative and oversee the next steps. A steering committee will also be established

## “The Cascading Climate and Health Risks in African Cities (CASCADE) consortium, launched in November 2023, addresses urban health challenges intensified by climate change and rapid urbanisation in African cities.”

to engage stakeholders and ensure the charter's principles are integrated within participating institutions.

## Tackling climate and health risks in African cities

The [Cascading Climate and Health Risks in African Cities \(CASCADE\) consortium](#), launched in [November 2023](#), addresses urban health challenges intensified by climate change and rapid urbanisation in African cities. CASCADE fosters transdisciplinary collaboration through participatory city learning labs in five African cities – Kampala, Harare, Accra,

Johannesburg and Cape Town – developing tailored solutions for local needs. A key focus is capacity building, empowering young researchers to tackle climate-health risks and fostering future scientific leaders, ensuring sustainable outcomes.

Led by Dr Chris Jack and Professor Bruce Hewitson of UCT's Climate System Analysis Group (CSAG), CASCADE collaborates with Makerere University, the University of Ghana and the Global Change Institute at the University of the Witwatersrand, with support from the Red Cross Red Crescent Climate Centre and START International. Building on CSAG's previous programmes, such as [Future Resilience for African Cities and Lands \(FRACTAL\)](#), the consortium leverages a long-standing partnership with the City of Cape Town to strengthen regional impact.

CASCADE is part of the Developing Excellence in Leadership, Training, and [Science II \(DELTA II\) Africa programme](#), which engages 75 institutions across 36 countries. This is led by the Science for Africa Foundation with support from the Wellcome Trust and the UK's Foreign, Commonwealth and Development Office (FCDO). DELTA II promotes world-class African research and scientific leadership across the continent, focusing on key research priorities such as infectious diseases, neglected tropical diseases, non-communicable diseases, and the social sciences and humanities.





