BRITISH COUNCIL

Global report by
Nadia El-Awady

The Climate Connection Higher Education Roundtable

Impact Mechanisms for Climate Change Research in Southern Africa

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About the Climate Connection

The British Council's Climate Connection programme brings people around the world together to meet the challenges of climate change.

Drawing on our global network, the Climate Connection programme connects 200 million people from different countries, generations and backgrounds – young people and policy makers, artists and scientists, business and community leaders, and many others.

In particular, it focuses on the next generation of climate leaders and gives practical support to young people and communities most impacted by climate change, helping them share their perspectives globally and achieve real change.

About the author

Nadia El-Awady

Nadia El-Awady is a freelance science writer and editor. She is the chief editor of Nature Middle East and a senior writer at Asia Research News. She also freelances for several Springer-Nature publications and clients. Nadia was a co-founder and the first president of the Arab Science Journalists Association, a president of the World Federation of Science Journalists, and a co-director of the 2011 World Conference of Science Journalists. She has taught university undergraduate-level online and science journalism, worked as a communications director of a large science institution in Egypt and managed journalism training programs. When she's not working, Nadia is out in the hills, on the mountains, diving in seas, or running, swimming and cycling.

Nadia has a MB BCh in medicine and surgery from Cairo University and a master's degree in journalism and mass communication from the American University in Cairo.

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Foreword

In October 2021, in the lead up to the COP26 climate summit and as part of The Climate Connection, the British Council hosted a series of online roundtables in Australia; Egypt; Japan; Indonesia, and South Africa.

The roundtables brought together stakeholders from higher education (HE); industry; governments and civil society to explore the role and purpose of the HE sector in responding to the climate crisis. The roundtable series explored a range of core issues including:

- **The role of universities in supporting governments to develop evidence-based climate policies.**
- **Whether the HE sector is equipping the next generation with the skills they need to live with the reality of climate change.**
- **How universities can be more adept at knowledge production and exchange and at working across traditional academic boundaries.**
- **Showcasing some of the latest collaborative climate research projects between the UK HE sector and counterparts around the world.**
- **The role universities play in the public discourse around climate change to help build wider trust in and understanding of the science.**
- **Exploring how Higher Education Institutions can reduce their own carbon footprint, whilst realising their internationalisation ambitions.**

The Roundtables, which were open to all, attracted audiences of students and Early Career researchers, academics, climate activists and policy makers. Importantly, attendees were given the opportunity to submit questions to the panel in advance of each roundtable. These helped inform and guide of the discussion and ensured that there was genuine and valuable interaction between panellists and the audiences.

Although each roundtable was hosted by a specific country, and the themes they addressed were relevant to that country and region, the issues addressed by the panels of experts and the resulting calls to action have significance for Higher Education sector leaders, researchers and policymakers globally. The roundtable series has already created new perspectives and have triggered conversations which we hope will result in new collaborations and ways of working.

SAA report

Impact Mechanisms for Climate Change Research in Southern Africa explored approaches to knowledge exchange which can enable universities to be more agile in their response to the climate crisis and have greater impact. The panel discussed different mechanisms for migrating applications and inventions from the bench to the community, and how universities can across traditional academic boundaries in order to innovate.

With the pressure to innovate accelerating, the panellists agreed higher education institutions in Africa still have a lot of catching up to do. They also identified a need to enhance multidisciplinary and multilateral research cooperation and for universities to come together to develop the needed innovations.

List of panellists

Ms Ela Romanowska (Chair)
University of Witwatersrand

Dr Oyediran Olusegun Oyebola (provocateur)
University of Ibadan

Dr Henri-Count Evans (rapporteur)
University of Eswatini

Ms Alice McClure
University of Cape Town

Professor Pat Naidoo
University of Johannesburg

Professor Martin Oosthuizen
Southern African Regional Universities Association

Dr Roshan Ramesseur
University of Mauritius

Dr Gilbert Siame
University of Zambia

Dr Tirusha Thambiran
Council for Scientific and Industrial Research, South Africa

Professor Cristina Trois
University of KwaZulu Natal

Professor Coleen Vogel
University of Witwatersrand

Southern Africa embraces the messiness of climate change

Southern Africa's rich tradition of knowledge exchange could help bring together the complex systems of modern society to solve the messy problems of climate change.

Climate change has long been discussed as a slightly abstract concept; yet it is here, it is now and it is real, said Susana Galvan, the British Council's South Africa country director, at the start of a roundtable discussion titled 'Impact Mechanisms for Climate Change Research in Southern Africa'.

The roundtable gathered panellists from Southern Africa to explore how climate change research in higher education institutions can cross the theory-practice divide and have a real impact on society.

The region may already have a head start, with strong regional and international research partnerships, collaborative work with local authorities and the establishment of living and learning laboratories with local communities.

A need for new paradigms

To address the challenges of climate change, we must first embrace the messiness, says Alice McClure, the academic co-ordinator for the Future Resilience for African Cities and Lands (FRACTAL) project at the University of Cape Town, South Africa. **'The risks [from climate change] and the opportunities for adaptation and mitigation occur at the intersections of complex social, political, financial and technical systems,'** McClure explains. At the same time, climate change is a cross-cutting issue that involves a broad range of disciplines. **'Bringing all this together requires a different paradigm that we haven't really wrapped our heads around yet,'** she says.

Southern Africa has a strong research community working on climate change, and many strategies and policies, says climatologist Coleen Vogel, of the University of Witwatersrand's Global Change and Sustainability Research Institute. These include a climate change bill currently being discussed in South Africa's parliament, adaptation policies, and the Southern African Development Community climate change policy. 'There is also a move, especially among African scholars, to bring different knowledge domains, like traditional, local and tacit knowledge, into the [climate change] discourse.'

The executive director of the Southern African Regional Universities Association, Martin Oosthuizen, adds there is a growing appreciation for the unique role played by universities in the response to climate change.

But for that response to be more directed, Vogel and Oosthuizen agree that the disjointed efforts of individual universities, and the many policies and strategies that have been developed internationally, regionally and nationally, need to somehow come together into a more coherent framework.

Universities also need to ask themselves a fundamental question: **'Unless we engage in a conversation about what the university is good for, not just what it is good at, we have a problem,'** says Oosthuizen. **'I think the challenge many universities are facing is that they don't quite know how to express what they are trying to do in terms of their societal contribution, while the reward and recognition systems are not in place to acknowledge that contribution,'** he says.

"We need to stop pretending it's a siloed problem and really work together and embrace the messiness."

Alice McClure, University of Cape Town

The structures of knowledge exchange

Despite the challenges and complexities, many Southern African higher education institutions have developed a tradition of knowledge exchange among each other and with their surrounding communities.

Ocean Acidification Africa (OA-Africa) [i] is a pan-African network of scientists that demonstrates the power of coming together. **'Ocean acidification, which results from the absorption of carbon dioxide into seawater, is the twin evil of climate change,'** says OA-Africa co-chair and biogeochemist Roshan Ramesseur of the University of Mauritius. It affects marine ecosystems and local economies by impacting the fishing and tourism industries, in addition to coastal infrastructure. But there are knowledge gaps in the consequences of regional ocean acidification on the African continent, explains Ramesseur.

This is where a very rich network of international ocean acidification bodies, including the Global Ocean Acidification Observing Network, the Ocean Foundation and the Ocean Acidification International Coordination Centre, comes in. This network is contributing to knowledge exchange and enhancing regional and local capacities and funding for high-resolution ecosystem monitoring. OA-Africa is also empowering scientists to play a stronger role in informing policymakers to include ocean acidification into their legal frameworks.

But policy needs to be translated into action, an area where researchers can play a role through advising local authorities.

Cristina Trois, the South African Research chair (SARChI) in waste and climate change at the University of KwaZulu Natal, has 20 years of experience providing local authorities with evidence-based advice for developing more sustainable infrastructure.

For example, Trois and her colleagues at the University of KwaZulu Natal developed a model to help local authorities in her region prioritise the sustained reduction of greenhouse gas emissions by the waste management sector. **'For many years, the parameters for developing an integrated waste management plan focused on cutting costs and implementing landfill sites,'** says Trois. Globally, this led to 90 per cent of solid waste ending up in 'super-emitter' landfill sites that account for six per cent of global greenhouse gas emissions, she says. Trois and her colleagues wanted to shift the municipal decision-making process so that it factored in other considerations, such as climate change, job creation potential and socio-economic factors, with the aim of prioritising the diversion of waste from landfills to treating, reusing, recycling or composting it. To do this, they developed a decision-making tool called the waste and resource optimisation strategy evaluation model to help municipalities choose waste management strategies that are good for the climate and the economy.

Trois says her research has had dramatically more impact on her surrounding communities since she became the SARChI in waste and climate change. SARChI was jointly established by South Africa's Department of Science and Technology and the National Research Foundation to strengthen the research and innovation capacity of the country's public universities. 'The infrastructure behind the initiative has contributed to advancing the profile and impact of our research,' she explains.

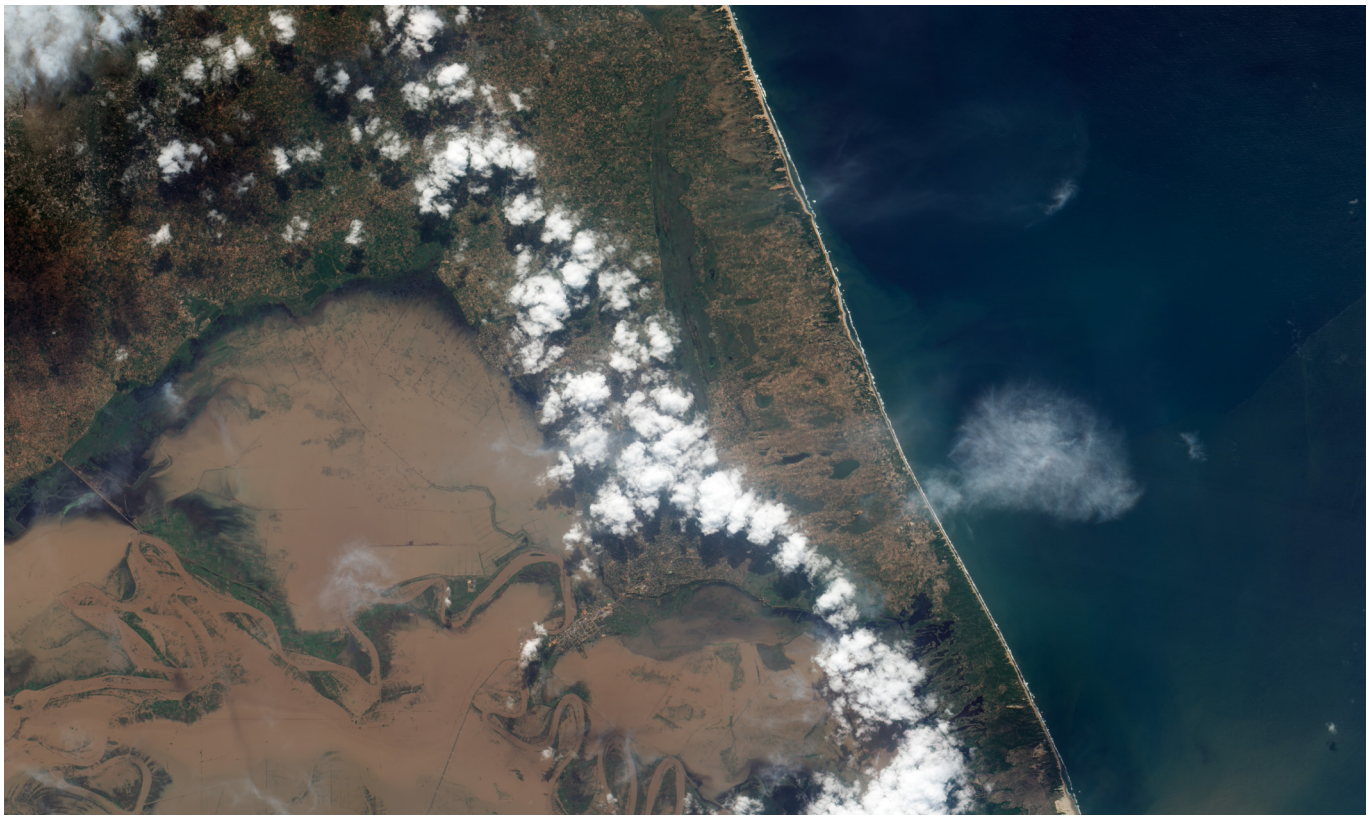
Learning and living laboratories

'I'm of the firm view that universities must be the laboratory for society,' says University of Johannesburg mechanical engineer and research and innovation chair in the green economy Pat Naidoo. He says this in the context of universities' role in providing climate change solutions and alternatives to fossil fuels. Naidoo thinks universities aren't doing enough. Even so, students at his university are now actively involved in finding creative innovations to transform currently used vehicles into electric ones.

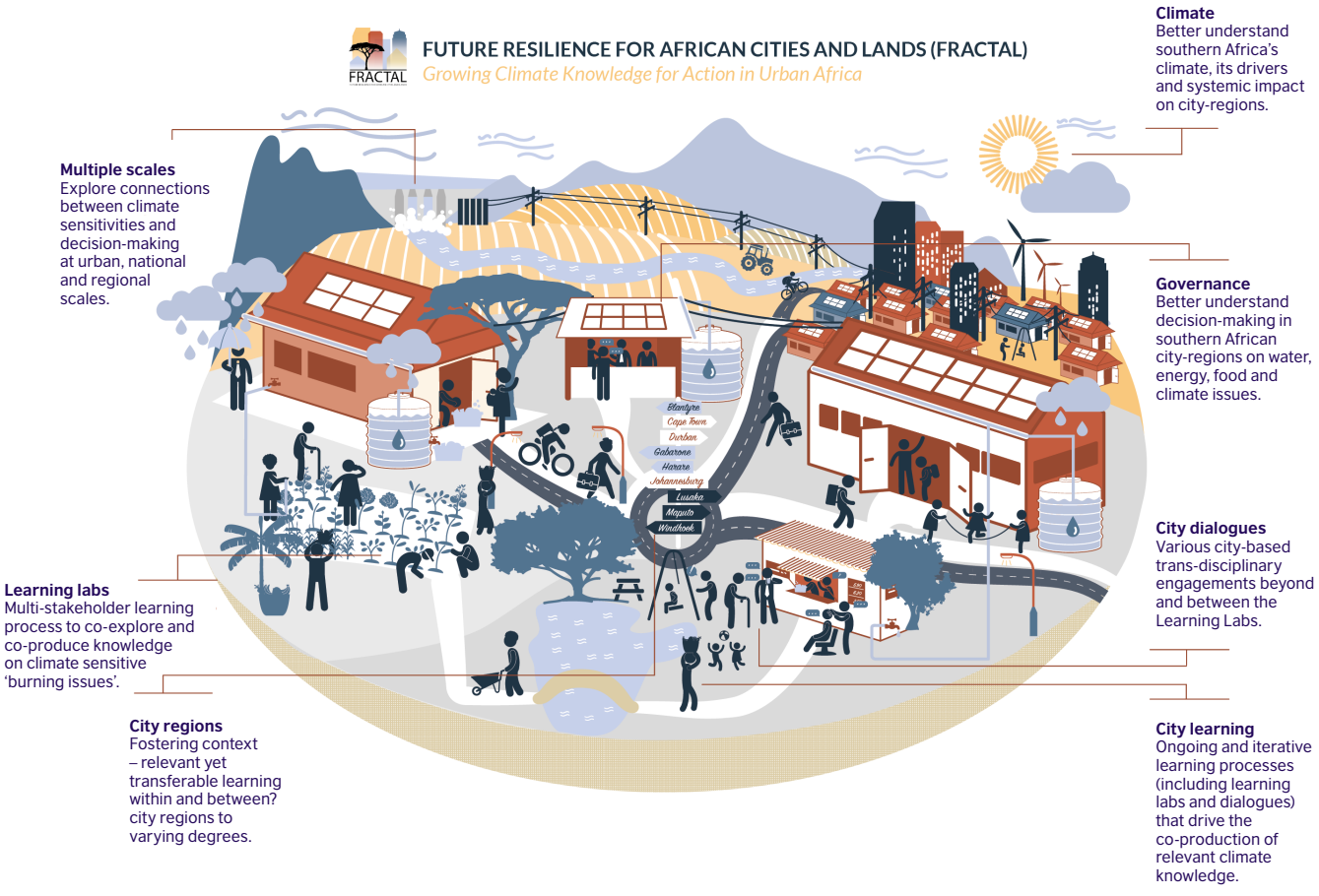
The director of the University of Zambia's Centre for Urban Research & Planning says university undergraduate and graduate students are a huge untapped human resource. Gilbert Siame explains that in a country like Zambia, the government has limited capacity to navigate the complex issues of climate change alongside some of its other pressing national priorities. He says universities need to realise that their large numbers of students and staff can help with environmental monitoring and in coming up with the innovations needed to address the many local challenges of climate change.

As a practical example of this, Siame is involved in the Educational Partnerships for Innovation in Communities–Network (EPIC-N), an international programme that is being implemented in several African countries. Through the programme, university students from a variety of disciplines work with scientists, local authorities and communities on urban development projects, for example to make plans for flood resilience and develop strategic infrastructures for managing urban sprawl. **'The beauty is that this is agreed between the city authority and the university, and we are able to assess students based on their community work,'** he says. Graduating students from the programme are highly employable, he says, because they learn communication skills and how to cross the theory-practice divide and understand governance dynamics in cities.

Satellite view of the South African coast.



The FRACTAL project is also enhancing the skills needed for the kind of transdisciplinary work required to tackle the challenges of climate change. FRACTAL aims to advance scientific knowledge about regional climate responses to human activities by engaging with a broad range of stakeholders. The project's academic co-ordinator, Alice McClure, has a personal interest in figuring out the relational skills needed by researchers to work across disciplines and with people outside of academia. **'Is it about listening better? Is it about asking the right questions? I'm not sure ... but these are the kinds of new skills that need to be taught to people coming through these research programmes,'** she says.



FRACTAL engages multiple stakeholders to identify climate-related problems at the city level and design locally relevant solutions.

Normally, innovation starts inside universities and is eventually taken to the outside for testing. 'What we did in FRACTAL was to try and flip that around,' says McClure. FRACTAL's City Learning Lab Approach[ii] brings together scientists from different disciplines, civil society organisations, youth groups and other partners to try to really understand the context in a city, its issues and priorities. **'We think about how the context might change over time and then how climate intersects with that context,'** she says. When they started, FRACTAL's team did not know what the learning labs were going to look like. **'We knew they were going to be context-led, collaborative and iterative,'** she says, and they aimed to use whatever came out of each lab in each city to inform the design of subsequent learning labs. 'It was really scary for the researchers, as you can imagine,' she says. FRACTAL set up learning laboratories in the capital cities of Zambia, Namibia and Mozambique that addressed locally identified issues, such as water security, energy and the risks from water-borne diseases.

Siame says living and learning laboratories can be described through three dimensions. First, they involve constant engagement and debate between researchers and policymakers. Next, **research should inform how universities manage their own transport, energy and water systems. 'Universities mimic cities in the way they function,'** he explains. Finally, **universities as living laboratories have a responsibility to make their science more accessible and available to the surrounding communities.**

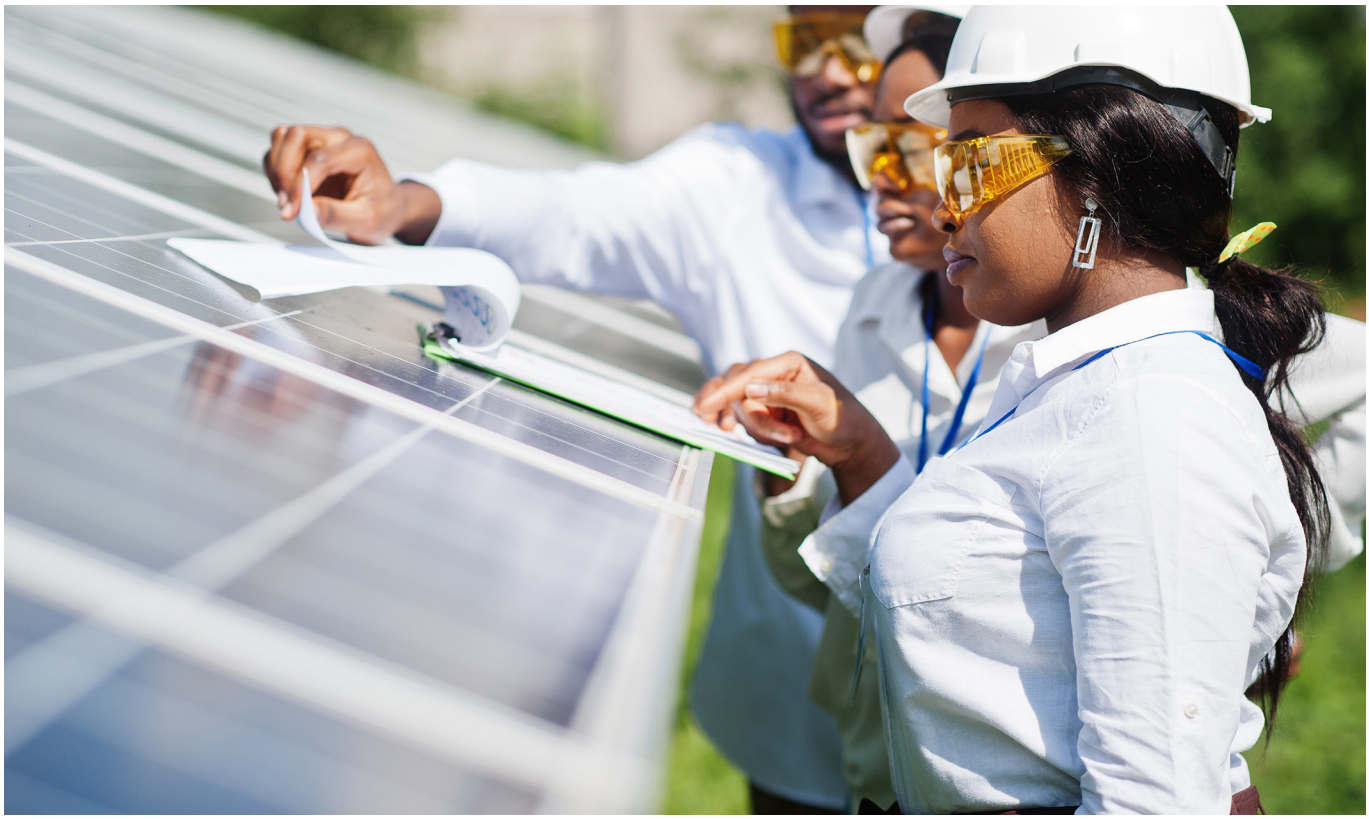
Actions and recommendations

'I think we can conclude that there is a need to promote more interdisciplinary research and teaching,' says Tirusha Thambiran, a senior researcher of air quality and climate change at South Africa's Council for Scientific and Industrial Research. **'We need to move out of our silos and work together across different research streams.'** Thambiran believes researchers need to put more thought into knowledge exchange as they design their research projects and to ensure this exchange continues beyond project lifetimes and funding.

Systemic change will require fundamental shifts in terminology, technology, policy and values, adds McClure. It also needs research that can assist cities to move from resilience, to smart cities that employ technologies, to wise ones that listen to their citizens and finally towards sustainability, says Trois.

Vogel urges more inward reflection, saying scientists must remain humble brokers who never give up that brokerage. At the same time, universities should acknowledge that being a 'pracademic', involved in the practical application of research, is as useful as being a so-called hard-core scientist.

Finally, the panellists agree that universities have a huge role to play as living and learning laboratories that have sustained engagement with their surrounding communities.



Reflections

'Climate change is a big issue in Africa,' says roundtable provocateur Oyediran Olusegun Oyebola, fisheries management researcher at the University of Ibadan in Nigeria. With the pressure to innovate accelerating, higher education institutions in Africa still have a lot of catching up to do, he says. They need to enhance multidisciplinary and multilateral research co-operation and come together to develop the needed innovations. Universities also need to develop curricula and short courses that support climate policy, planning and structures, he adds. Additionally, higher education institutions need to develop sustainability indices that are more suitable for the African context. Finally, they can and should play a critical role in advising local and national authorities on climate change policy implementation.

'As the world moves towards a climate tipping point, universities have an essential role in helping the world find ways to reduce emissions, and to be the world's soul and heartbeat that provides hope and solutions to the enormous problems we face,' says Henri-Count Evans, a climate change communication researcher and lecturer at South Africa's University of Eswatini. 'Moving forward, universities have a moral duty to invent and innovate with the Earth in mind. To save the planet, universities must produce knowledge that is just and sensitive to the environment and to the people dependent on it.'

The roundtable discussion was chaired by Ela Romanowska, the director of innovation support at South Africa's University of Witwatersrand, in partnership with the Southern African Research & Innovation Management Association. For full details and a video, please visit: **https://www.britishcouncil.org.za/programmes/climate-connection/climate-change-research-in-Southern-Africa**

[i] https://www.oa-africa.net/

[ii] https://www.fractal.org.za/wp-content/uploads/2020/03/IS1-FRACTAL-city-learning-lab-approach.pdf